The Families and Genera of
North American Diptera

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C. H. CURRAN
1934
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Errata

p. 22. add the following line:
Wings rounded at the apex, almost always with crossveins. . . . . . . . . . . . . . . . . 31.
p. 76. Isoccacta Garrett = Alluaudomyia, and not Dasyhelea.
p. 82. third line, for Ampheles read Anopheles and for Algypli read Aegypti.
p. 274. for ‘‘29’’ in middle of page read 24.
p. 405. second line, for Sarcophaga read Sarcophaga.

p. 395, couplet 4, for 104 read 140.
p. 499, Aphocera, for 47 read 447.
Preface

Twenty-five years ago Williston’s Manual of North American Diptera (third edition), was offered to the public and in the interim it has held the esteem of students of Dipterology in every quarter of the globe. Williston’s first synopses of families and genera appeared in 1884 and following years in the Bulletin of the Brooklyn Entomological Society and in 1888 the first edition of the ‘‘Manual’’ appeared. This ‘‘pamphlet’’, as it was modestly termed by its author, contained 88 pages, excluding as it did, the Nematocera and Muscoidea. The second edition appeared in 1896, and included the Nematocera but omitted the Tachinidae and Dexiidae. The third edition contained all the families, fifty-eight in number.

The present attempt at a classification of the genera of North American Diptera is the result of many years of study but it is inconceivable that this work should be uninfluenced by such a masterpiece as that of Williston. That a new synopsis is urgently needed becomes obvious when one considers the enormous number of new genera described since the appearance of Williston’s Manual, the realignment of genera, the application of newly discovered characters and the increased importance of the study of flies in relation to human welfare.

Knowing, as I do, the excellent quality of Dr. Williston’s work it is with temerity that I offer this contribution to a critical public. Even though great pains have been taken in its preparation and every effort has been made to make the keys as complete and simple as possible I fear that some few errors have crept in. That is inevitable. Where they occur I do not now, nor do I offer excuses for them other than to admit an utter ignorance in regard to the characters of thousands upon thousands of Diptera, even though I have had available for study the excellent collections of the Smithsonian Institution, Canadian National Collection and the American Museum of Natural History and the generous assistance of various specialists. If mention is not made of those who have contributed to this work, either wittingly or unwittingly (through their synoptic revisions), it is only because the body of the paper has increased to such proportions that a complete acknowledgment must be omitted.

A few innovations will be found. Where reasonably complete specific keys occur these are referred to in footnotes and the same is true in the case of family revisions. The synonymy has increased so greatly that some indication of it must be given, especially where old familiar names have been changed; this is indicated in the index and while it is far from complete it is hoped that some help may be derived from such an arrangement.
It is my hope that those who may discover errors or omissions may be kind enough to call them to my attention, indicating the manner in which the corrections may be made. Owing to the numerous footnotes it has not been possible to indicate the genera which have been included from description only. Such genera naturally weaken a key as it is impossible to use characters which may be available for a more suitable arrangement. Any specimens representing genera improperly placed, or not common, would be most greatly valued by the author.

Finally I wish to express my unbounded admiration for the late Samuel Wendell Williston. To him I owe, as do very many others, an everlasting gratitude for his kindly encouragement, while he lived, and real inspiration from his printed works. I know of no Dipterologist who has so clearly set forth the facts or who has been so great an inspiration to others. And as a slight token of my appreciation I respectfully dedicate this book to his memory.

C. H. Curran.

American Museum of Natural History,
New York City, 1933.
Introduction

Acknowledgments

It is impossible to express fully my appreciation of the generous cooperation of all those who have assisted in the preparation of this work. It is most fitting that I should mention first the generosity of Mrs. S. W. Williston for not only permitting me to use the illustrations from Williston's "Manual of North American Diptera", but for her offer to furnish the cuts themselves. Needless to say this offer was accepted and many of the illustrations are reproduced from cuts used in the Manual. Unfortunately, due to a rearrangement of many genera and their transfer to different families, it has not been possible to use all of the cuts. Further, in this connection, I owe much to Mrs. George Shor, a daughter of Dr. and Mrs. Williston, for her assistance in this matter, and for her sympathy in the work. It might not be out of place to mention here that, according to Mrs. Shor, her father, upon the completion of the manuscript of the third edition of his Manual, dropped it upon his desk and remarked: "Well, that's finished. When it is revised again, it will be by someone else."

Every request for the loan of specimens and for the review of keys met with a wholehearted response and as a result the value of this book has been greatly enhanced. Dr. C. P. Alexander is deserving of especial thanks for the preparation of the manuscript dealing with the Tipuloidea and the preparation of the illustrations for that superfamily. Drs. Jos. Bequaert, C. T. Brues, O. A. Johannsen, Robert Matheson, F. M. Root and Mr. Marston Bates have assisted very materially in checking over keys and suggesting changes. Dr. E. P. Felt suggested the use of illustrations from his papers published in the Bulletins of the New York State Museum on the Cecidomyidae (Itonididae) and Dr. C. C. Adams very generously furnished the cuts. Drs. J. M. Aldrich, F. H. Benjamin and Mr. Marston Bates, and others have loaned specimens not found in the American Museum collection and Dr. Matheson has given permission to use illustrations from his "Handbook of the Mosquitoes". I wish also to express my appreciation to all those Dipterologists of the past and present whose works have been so freely drawn upon.

The preparation of a work of this kind entails a large amount of stenographic and routine work and for the careful typing of the manuscript I am indebted to Miss Ethel Olsen. Mr. Adolph Klein has contributed the excellent colored plate of several typical forms, while my wife has assisted with the illustrations and in many other ways.
For the encouragement he has given during the preparation of the manuscript I shall always feel a deep sense of gratitude to Dr. Frank E. Lutz. The American Museum of Natural History is deserving of particular mention, since the work has been done in this institution without any limitations as to time devoted to it.

If the book should be found useful and helpful, full credit should be given to the Museum as well as to all those who have so generously given of their time and knowledge.

**Collection and Care of Diptera**

So much has been written about the ease with which collections of insects may be cared for that I feel a word of warning to be not amiss. It is true the Lepidoptera and Odonata may be “papered”, Hymenoptera, Hemiptera and Coleoptera may be packed between layers of cotton and Coleoptera may be collected in alcohol but most of the other Orders require more care. With the exception of Coleoptera and the small insects normally collected in alcohol and intended for study in this liquid, or for slide preparation, all insects are much better pinned while fresh. Packing Diptera between layers of cotton may result in recognizable specimens and a small percentage of really good specimens may be secured but the majority can never be made to look attractive.

With small flies pinning should take place within four or five hours of the time of capture and all specimens should be mounted within eight hours. In cold or damp weather a greater time may be allowed to elapse and the time should be shortened in hot, dry weather.

**Mounting** Diptera should not be a slip-shod process and care should be taken to have the flies an even height on the pins. An excellent practice is to have the mesonotum about one-third the distance from the top of the pin. This permits of careful handling of the specimen and reduces danger of damage to a minimum. Many Entomologists pin Diptera less than a fourth the distance from the head of the pin with the result that the specimens are quickly damaged and ultimately cease to have value. **Double mounts** should never be used for Diptera. If a specimen is too small to be pinned through the thorax it should be fastened to the side of the pin by first circling it (the pin) with a narrow ring of white shellae and touching it to the side of the insect. In this way the specimen may be handled in the usual manner and all parts may be readily seen. If possible, the wings should be arranged so that they extend over the back of the insect in an upright position. Pins of suit-
able size should be used and it will be found that good, steel No. 00 pins may be used for quite small insects for pinning through the thorax. Some collectors seem to have a craze for double mounts, not realizing that the value of their collection is greatly lessened due to the increased risk during shipping and many of them place the accessory mount much too high on the pin. Another practice, that of placing specimens (nicely spread, it is true) on a circular or oval mount of cardboard by use of minute pins, is to be condemned as the characters available on the under side of the specimen are concealed.

**Labelling** is an important detail and insufficiently labelled specimens are of little more value than none at all. The fact that a proud collector knows exactly when and where he captured a certain prize is of no value to the student who must needs study the specimen in the absence of the collector. Every specimen should be labelled with the locality, date and name of the collector. Labels should be small and neat and should be placed on the pin along the long axis of the insect, the locality on the right hand side. Labels should never be placed crosswise as they are liable to damage adjacent specimens when the insect is being removed for examination. One guide to labelling all insects is to remember that the label should afford protection to the specimen and not be so large that the collection looks like a collection of locality labels rather than one of insects. The labels should be printed, either by machine or by hand and the month should always be in Roman numerals.

In various places in the following pages will be found instructions for the care of those flies which require special attention. No doubt there are many people who will neglect to read the instructions here but to those who do I offer a few pertinent hints. Never place Diptera in vials or bottles with other insects. Never cram a vial full of flies. Shake them loose occasionally so that the wings will not become folded. Never place small flies in a vial with large ones and be careful not to place more than a few specimens of flies which rub easily in a vial. Always keep mating pairs together: a good plan is to have a vial for this purpose and to put only different species in it.

**Collecting outfits** need not be elaborate. I usually carry six to eight test tubes and a bottle about an inch across and four inches long. If the collecting is to be general a bottle two inches across may be carried. Such an outfit will suffice for a half day of very good collecting and if the trip be an all-day one the catch may be transferred to a box and stored in a cool place. Empty match boxes are convenient receptacles for the transference of fragile specimens and pairs.

The making of the bottle is a simple affair. Get some fine sawdust, place in the vial or bottle a small amount of sodium or potassium cyanide
and add about half an inch of sawdust; wedge this in with a ball of cotton, place in the sun for half an hour and the bottle is ready for use. The cyanide should be broken into small lumps but need not be particularly fine. It must be remembered that cyanide is a deadly poison and extreme care is necessary in handling it. Do not use it unless you are properly instructed, and if you do, be sure to destroy by burning or burying all paper, pieces of wood, etc., which the cyanide might have touched and wash thoroughly in running tap water hammers, etc. used in crushing the material, as well as your hands. Never handle cyanide if there is an open sore upon the hands. A little extra care may be worth a lot. It might not be amiss to note here that the most efficient antidote for cyanide poison is the intra-venous injection of methelyne blue, one of the best known aniline dyes.

**Flies and Disease**

As agents in the spread of diseases of mammals the Diptera undoubtedly rank first in importance among the insects. The chief carriers of diseases are, of course, the biting flies belonging to the families Psychodidae, Simuliidae, Culicidae, Tabanidae, Glossinidae, Ceratopogonidae and Muscidae. Species of *Flebotomus* carry papataci fever, verruga or oroya fever, kala-azar and oriental sore. Other names are applied to these diseases. The mosquitoes carry blackwater fever, yellow fever, dengue, filariasis and malaria. Onchoerciasis is carried by species of *Eusimulium*. A form of filariasis is believed to be carried by a species of *Culicoides* and species of *Chrysops* are known to transmit the disease. Tularaemia, anthrax and trypanosomiasis are other diseases transmitted by Tabanids. The stable-fly, *Stomoxys calcitrans*, is known to carry a number of species of trypanosomes and may also be responsible for the spread of poliomyelitis (infantile paralysis), although no definite proof has been obtained. Sleeping sickness is carried by the Tse-tse flies.

In addition to carrying diseases the biting flies themselves cause a great deal of irritation by their bites, especially in the vicinity of water. Life is often made miserable in northern regions by the hordes of mosquitoes and black flies while the sportsman is plagued by almost all the biting forms while in the woods and bathers come in for much undesired attention from no-see-ums, mosquitoes and Tabanids, particularly the so-called "green-heads", along the coastal regions.

The house fly carries on its body the germs causing typhoid fever, dysentery, cholera, anthrax and conjunctivitis, while a few other flies carry other diseases. Considerable has been written about myiasis caused by the larvae of flies living in the human body. If we except the
bot-flies, I think that we may regard the occurrence of fly larvae in the body of man as entirely accidental and dismiss the matter as being a subject of academic interest rather than one calling for serious consideration. There are, of course, the bot-flies, belonging to three distinct families and they are serious pests. In the tropics one species commonly attacks man, but the greatest damage is done to domestic animals. Hides are frequently so greatly riddled with "warble" holes as to be almost valueless.

The bird and bat parasites, as well as the so-called bee-louse (Braula cacea), are probably not serious pests although the sheep tick, belonging to the Hippobosceidae, is often sufficiently numerous to cause serious damage and some species of Hippobosca bite humans in addition to their attacks on horses, camels, etc.

In many places the so-called blow-flies cause serious loss to sheep owners by "blowing" the wool.

I have given just a very brief summary of some of the injury caused by flies to animal life, as it affects human welfare, and a very great deal that is of interest has been omitted. One frequently receives inquiries as to the diseases carried by flies, and these few paragraphs may serve to answer the questions. In the following pages, under the families mentioned, additional information is given, particularly concerning diseases carried by flies in North America. If the student desires further information on this important subject he should secure a copy of one of the better books on Medical Entomology.

Flies and Crops

It is impossible to enumerate all the flies attacking field, horticultural and garden crops, but mention might be made of the various root maggots, the leaf miners, gall makers, fruit flies, grass stem flies and the Hessian fly. The amount of damage done by the groups of insects mentioned must be enormous but it must be remembered that there can be no actual measure of crop damage from a financial point of view. A large crop invariably means lower prices and a small crop higher prices. It is only when individuals or limited communities suffer serious loss in the volume of their produce that there is any real loss, and then it is of a local nature and not national for the producers of the crop affected. It so happens in such cases that one man's loss proves to be another man's gain. While flies undoubtedly do a great deal of damage to our crops and flowers, they are of less importance in this respect than some of the other orders of insects and the Diptera are, in actual fact, much more beneficial than injurious.
Benificial Flies

No group of insects, except, perhaps, the Hymenoptera, are so important to mankind as are the flies. In these two groups are man's best friends among the insects. It would be useless to argue about the relative merits of the two orders because we know so little about them that no one is in a position to make any authoritative statement. It is sufficient to say that flies play an extremely important part in the pollination of flowers, but they undoubtedly occupy second position to the bees. It is in the field of predaceous and parasitic members that these two groups render the greatest service to mankind. If the world should suddenly find itself without flies and bees it would quickly revert to a sphere lacking animal and plant life, so important are these insects in maintaining the "balance of nature".

I believe that the majority of flies, in relation to the number of known species, are either predaceous or parasitic on other insects. Such large families as the Asilidae, Empidae and Dolichopidae are all predaceous in the adult and probably in the larval stage, while the Bombyliidae, Nemestrinidae, Conopidae and Tachinidae are insect parasites. Other families or groups can be added to the list and we might also include forms which are predaceous in the larval stage. More about the habits of flies will be found in the following pages.

Flies are also beneficial as scavengers and examples of their effectiveness may be found everywhere. They dispose of carcasses, decaying vegetation and waste animal products and in this way do much to keep the air pure and wholesome.

Anent the Insect War

I am aware that there has been some sensational propaganda about "the war against insects" and I cannot forego a few remarks. Insects are our best friends and we owe a great deal to them. They are also our worst enemies but this fact should not be proclaimed from the housetops without at the same time crying much louder of the benefits they give us—flowers, fruits, vegetable, clothes, food, pure air, beauty. The stressing of the danger of the "insect menace" may do entomology a great deal of harm and I think it has already done some. It has taught people to dislike all insects and the fact that the "menace" has not developed perceptably has resulted in some loss of faith in entomologists.

The Diptera contain some of our worst enemies. The public should be made aware of this and steps taken to eliminate the pests in so far as possible. Every effort must be made to keep people suffering from
insect-carried diseases out of the country, if such diseases do not occur here and if there are any known carriers of the disease among our insect population. Yellow fever is an excellent example. We have the yellow fever mosquito and if persons suffering from this disease should enter any part of the country where the mosquito occurs the disease might well become established. Every effort should be made to reduce the numbers of the house-fly, stable-fly, and other pests. On the other hand the introduction of parasites, particularly of imported pests, should be encouraged and people should learn to differentiate at least the more beneficial of their insect friends.

Morphology of Diptera

It is not my intention to go into detail concerning the structure or morphology of flies since I have appended a glossary of terms used in this and other works. However, a few remarks on the subject may not be amiss. In Williston’s manual a simple system of nomenclature is used and I follow the same system. During recent years attempts have been made to homologize the parts of the various orders of insects and as a result many long and unfamiliar terms have been proposed. To my mind the homologies of the parts are much less important to the systematist than a simple, easily followed and long used terminology. Nevertheless it is important to know the origin of the various parts, especially so to a zoologist, if he deigns to study that group which comprises three-fourths of the animal kingdom. In each order of insects a simple terminology has long been in use and such terms should be employed because the average student can understand them without difficulty. After all, some one has said that “Nature is an open book, and you have but to study nature to understand.” Perhaps those are not the exact words, but they will do.

The determination of genera is based upon structure and it is therefore necessary to be acquainted with these parts. The average student will find no difficulty on this score if he will follow the simple expedient of using the keys and consulting the glossary. In this way the terms used will soon be mastered and the student will find little difficulty in tracing out specimens.

The student who desires to delve into the anatomy of Diptera should obtain a bibliography of the works on this subject, particularly those by Crampton and Snodgrass. Many references will be found in Imms’ “Recent Advances in Entomology” and “Biological Abstracts.”

It will be found that authorities differ as to the origin and homology of different organs. A comparison of the Comstock-Needham system as used by Dr. Alexander in this work and that of Comstock will
show certain differences while others disagree in the terminology as applied to the veins in other families of Diptera as well as in other orders of Insects. It must be pointed out that the Comstock-Needham terminology of wing venation is very widely used, probably by more students of Diptera than any other system, and if American students desire to study exotic flies they must familiarize themselves with this system as well as the system used by many Europeans. Explanations of these systems will be found in the glossary.

Classification of Diptera

The classification of any group of animals is a complex problem having its basis in the morphology, histology, embryology and general biology of the phylum, and without a knowledge of these “ologies” no satisfactory classification can be obtained. In addition we must also turn our attention to palaeontology, although it must be confessed that very little is known concerning the Diptera of the past ages. In the present work we deal almost entirely with morphology of the adult flies, not from any desire to ignore the other phases of study, nor from any lack of interest in them, but because our space is so limited and each field is so vast that a lifetime of study would leave any field almost untouched. The truth is that we know practically nothing about the biology of flies although we may say, in a general way, that we are acquainted with their mass biology and that we can usually place a species biologically by associating it with some related form.

The taxonomist, however, is forced to deal with adult structures, to classify the creatures by characters he may select and to leave to some one else the pleasure of working out the biology of the insects studied. If you are at heart a taxonomist and are informed that you know nothing of biology unless you study life histories, do not be discouraged. Instead, feel rather strongly inclined to turn a deaf ear to your adviser, taking solace in the fact that even though you may spend all your available time at the systematic study of the adult insects, and gleaning what you may from the writings of others on biology and life history studies, you will never be able to fully master the field you have chosen. There are so many flies that no one can ever truly profess to know them all and their very numbers preclude a thorough survey of the order tending to a complete classification.

It is well, and necessary, to warn against too great specialization, and at the same time it is realized that many students with limited time are unable to study more than one or two families. The great trouble with the intensive specialist is that he loses his sense of proportion and relatively minor details are liable to assume the greatest importance in
his mind. In order to overcome this intra-specialization the student should enlarge his outlook by collecting in other families and also in other orders, even though no time be available for a study of his complete catch. The collector who studies a single family may produce a monumental work providing he is painstaking and accurate while the general worker is less liable to accomplish lasting results.

I hope I may be excused if I wander a little aside from a technical discussion of classification to discuss lighter but equally important matters. The real object of this work is not the classification of the Diptera but the presentation of keys to enable the student to place his specimen in the proper genus—or, in short, the generic identification of flies. Nevertheless, we must glance below the generic classification and find out something about species, and it is about the description of species of which I wish to say a few words here.

There is nothing more pleasing than a good description and nothing more aggravating than a poor one. All of us, in our ignorance, may offer poor descriptions at times but we should always strive to make them clear and concise. We should try to step beyond ourselves and look at the description from the viewpoint of another student. If two animals are different, in our estimation, we should clearly express the differences, laying special stress upon the outstanding characters. A description should not be too long, nor should it be brief and stilted. I can do no better than recommend that every Dipterist read the descriptions contained in Williston’s "Synopsis of North American Syrphidae" and pattern descriptions after those. The elimination of words and the excessive use of abbreviations is scarcely to be condoned, even on the ground that it is "scientific". If "science" is to be measured by a stilted language and a lack of consideration for others, it deserves little consideration from humanity as a whole and we should divorce "science" and study insects just for the fun of the thing.

Today the student need not worry a great deal about some one "stealing his thunder". Most eminent entomologists are only too glad to be of assistance to the young student and to leave to him the description of new species. This does not mean that the specialist is willing to name large collections and return all the material. If he were he would be so swamped with work that he would have no time for his other duties. Most specialists name material on the understanding that they may retain what they wish, and as a rule they desire very little. The beginner should be only too glad to assist the specialist by filling in gaps in his collection, because every species added makes his work that much easier in future. It must also be remembered that many specialists are employed by institutions having large collections of unworked
material and that every collection named means less time for institutional work and, to make a blunt statement, it is only fair to expect the institution to look for some return from the labor of its employees. However, I do not know of anyone who is not happy to verify a student's findings and to give opinions and suggestions concerning the distinctness of specimens, and, of course, in such cases they are returned if desired.

I cannot condemn too strongly the professor who permits a student to work on a systematic or biological paper and to allow or even urge that the results be published unless the material has been examined by a specialist, or the species of which the biology is being studied has been identified by one in authority. Each year many students are given such problems and the results are frequently very unsatisfactory. Too much care can not be exercised in the preparation of scientific descriptions of either genera or species and it should be realized that a good collection must be available before any work can be faithfully undertaken.

The preparation of keys is a very important matter and their incorporation in a contribution adds greatly to its value. Some authors attempt, in their keys, to portray what they term a 'natural classification', but it should be borne in mind that this is impossible. We know too little about the insects with which we are dealing to produce any such result. In preparing keys we arbitrarily accept one or more characters for the separation of groups and, if the key is to be useful, the characters used for each separation must be clean-cut. In any large group it will be found to be very difficult to find clean-cut characters in every case, some forms apparently going into either group although the character used may serve for the vast majority. In cases of this kind the doubtful forms should be run through both categories. In the so-called 'natural' grouping it is very frequently necessary to employ characters which are not conspicuous and such keys are liable to prove very difficult to use. Characters expressing a degree of variation should be avoided wherever possible, i.e., front produced vs. front less produced. These characters may be obvious to the maker of a key but are certainly not recognizable to other students whose collections may be limited. It is usually easy to use a key if you know most of the forms but often difficult or impossible otherwise.

All keys should be dichotomous and the use of more than two alternatives should always be avoided. In a short key one may use the "a" and "aa" system but it is not to be recommended in any case. Keys so constructed are more time consuming than such as are used in the present work. In the present case an attempt has been made to
produce simple keys, amply illustrated. It must be remembered, however, that the illustrations will not serve for all species in a genus but represent, as a rule, typical forms.

No use has been made, in general, of subfamilies or subgenera. The use of such almost always calls for many exceptions and also unnecessarily encumbers the literature. A sub-family is supposedly a distinct entity within a family, a group separable upon certain characters, but that such classification is unnecessary is evidenced by the exceptions. As an example—the Tachinidae have been divided into many sub-families, or even families, upon such characters as the absence of abdominal bristles, shape of head, etc., etc., but there is not a single character, nor for that matter group of characters, upon which any of these groupings may be retained. Many of the characters in this family are excellent up to a certain point, but every character falls down, not once, but in many instances throughout the family. It is entirely impossible to separate the Tachinidae and Dexiidae, just as it is to separate the Muscidae, Anthomyiidae and Scatophagidae.

Subgenera are superfluous. They are proposed as a rule because the author hopes that some day some character may be found upon which a distinct genus may be based. It is well to remember that in nature there is no such thing as a subgenus, genus or family. Their use is a human creation made possible because links connecting the groups have either entirely disappeared or have not been discovered by man. Genera are therefore artificial and the answer to the question of "what is a genus?" is that it is something limited in some way by some one. This may sound facetious but it is not meant to be so. The truth is that certain arbitrary characters have been set up, all the species falling within the limits set forth constituting a genus (or a species or family). It is presumed, but by no means certain that connecting links do not exist.

Many people describe sub-species, varieties, races, forms, etc., especially in the Lepidoptera, but, fortunately, the fad has not become extensive in Dipteroology and it is to be hoped that it may never do so. In actual fact there is no difference in a sub-species, race or variety. A variety is something which differs from the typical or first described form in some definite way. They are explained as potential species, ignoring the fact that no two specimens are exactly alike and that if two extremes of similar type should mate a new race would be formed. In each batch of eggs there are produced forms possessing characters somewhat different from the parents. But the species does not change because the average is maintained by the resultant mating. It is only when forms become more or less isolated that a definite trend occurs and
so-called races (supposedly geographic forms) are developed. In such cases connecting or transition forms usually occur and it is almost always true that the races, say northern and southern, are connected in the intervening region by a perfect transition of the characters of the two races. Races are interesting but it is not necessary to give them names. Moreover, "variety" was used in the same sense long before people thought of "races" for biological classification and I think we may extend the law of priority and use it in this sense, thus eliminating "race" and "sub-species".

The naming of aberrations, transition forms and such things should be beyond the pale in true science and such a practice must eventually result in ridicule of the science as a whole. It is, of course, very necessary to call attention to these forms but to name them is utterly needless. Knowledge of them is essential in tracing out the relationship and development of species, and of great interest, too, but we should not lose our perspective and attach exaggerated importance to names.

**How to Use the Keys**

The use of keys is not a difficult matter but there may be some who have not had experience with them. Some keys may not be altogether simple and may not run as smoothly as others. To find the genus to which your specimen belongs turn to the table of families (on the following page) and read over couplet 1. Two alternatives are given: the insect must go in either section. If it has large wings you go to couplet 2 and you repeat the process until it is found that your specimen comes to a section where it agrees with the diagnosis ending in a family name. You have now found the "family", but to be sure read over the other alternative so that the characters in both may be checked. Now turn to the family indicated and continue in the same way until the genus is reached.

It should be remembered that keys are merely guides and the fact that a species traces out to a certain place in a key is no guarantee that it actually belongs there. If one is familiar with the genera of a family he may be reasonably certain either that the insect belongs where it traces or that it is quite different; in either case he should check with descriptions of genera not included in the key or with the genus included, either by means of determined specimens or with the generic description. If a specimen does not seem to agree with the genus to which it traces check back and try one of the other alternatives since there may have been an error in interpretation of the characters used or the specimen may be one that is somewhat aberrant.
<table>
<thead>
<tr>
<th>Table of Families</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Wings absent or greatly reduced.</td>
</tr>
<tr>
<td>Wings present, rarely reduced.</td>
</tr>
<tr>
<td>2. Antennæ composed of six or more freely articulated segments.</td>
</tr>
<tr>
<td>Antennæ composed of not more than five freely articulated segments, the third segment sometimes complex, usually bearing a style or arista</td>
</tr>
<tr>
<td>3. Mesonotum with an entire V-shaped suture</td>
</tr>
<tr>
<td>Mesonotal suture transverse, not V-shaped</td>
</tr>
<tr>
<td>4. Ocelli absent</td>
</tr>
<tr>
<td>Ocelli present</td>
</tr>
<tr>
<td>5. Only one anal vein reaches the wing margin</td>
</tr>
<tr>
<td>Two anal veins reach the wing margin</td>
</tr>
<tr>
<td>6. Second and third veins each with two branches (radius 5-branched)</td>
</tr>
<tr>
<td>Second and third veins with only three branches reaching the wing margin (radius 4-branched) (Tipulidæ plate II, fig. 12)</td>
</tr>
<tr>
<td>7. Wings without a network of folds or creases</td>
</tr>
<tr>
<td>Wings with a network of fine folds or creases</td>
</tr>
<tr>
<td>8. Ocelli present</td>
</tr>
<tr>
<td>Ocelli absent</td>
</tr>
<tr>
<td>9. Costa continuing around the wing, although weakened behind.</td>
</tr>
<tr>
<td>Costa ending at or near the wing-tip</td>
</tr>
<tr>
<td>10. Discal cell present</td>
</tr>
<tr>
<td>Discal cell absent</td>
</tr>
<tr>
<td>11. Tibiæ with apical spurs</td>
</tr>
<tr>
<td>Tibiæ without apical spurs, though produced spur-like</td>
</tr>
<tr>
<td>12. Eyes more or less connected by a projection above the base of the antennæ</td>
</tr>
<tr>
<td>Eyes separated</td>
</tr>
<tr>
<td>13. Antennæ placed below the compound eyes, usually close to the oral margin</td>
</tr>
<tr>
<td>Antennæ situated at most slightly below the middle of the compound eyes</td>
</tr>
<tr>
<td>14. Costa continued around the margin of the wings, though weaker behind the apex</td>
</tr>
<tr>
<td>Costa ending at or near the apex of the wing</td>
</tr>
<tr>
<td>15. Wings very broad, the posterior veins weak and poorly developed.</td>
</tr>
<tr>
<td>Wings narrow and long, the posterior veins stronger</td>
</tr>
</tbody>
</table>
16. Wings lying flat over the back when at rest; metanotum short and without a longitudinal groove; femora sometimes swollen. 
(p. 74) **CERATOPOGONIDÆ**
Wings lying roof-like over the back when at rest; metanotum long and with a median longitudinal groove; legs long and slender. 
(p. 69) **CHIRONOMIDÆ**

17. Wings short and broad, folded roof-like over the body when at rest, usually pointed ........................................(p. 78) **PSYCHODIDÆ**
Wings long, or if broad, the apex very broadly rounded, always lying flat over the back when at rest .......................18

18. Venation very much reduced, several of the veins lacking. 
(p. 101) **CECIDOMYIDÆ**
Venation not reduced, the veins strong ..................................................19

19. Basal cells long, extending to or beyond the middle of the wing.......20
Basal cells, especially the second, short, not extending nearly to the middle of the wings .......................(p. 67) **THAUMALEIDÆ**

20. Apical veins strongly arched ............................................(p. 80) **DIXIDÆ**
Veins straight or nearly so ..........................................(p. 83) **CULICIDÆ**

21. Fourth posterior cell widely open .....................(p. 59) **ANISOPODIDÆ**
Fourth posterior cell closed ..................................(p. 133) **RACHICERIDÆ**

22. Empodium developed pulvilliform, the three pads nearly equal ......23
Empodium hair-like or absent ..................................................29

23. Third antennal segment compound, composed of annuli ..........24
Third antennal segment simple, usually bearing an elongated style or arista .............................................27

24. Squamae large and conspicuous ..................(p. 148) **TABANIDÆ**
Squamae small or vestigial .................................................25

25. At least the middle tibiae with spurs ........................(p. 146) **CÆNOMYIDÆ**
Tibial spurs absent .........................................................26

26. Posterior branch of the third vein ending before the wing-tip. 
(p. 134) **STRATIOMYIDÆ**
Posterior branch of the third vein ending well behind the wing-tip. 
(p. 155) **PANTOPHTHALMIDÆ**

27. Squamae very large; head very small, placed low down, composed almost entirely of the eyes, the face and front very narrow or obliterated. 
(p. 203) **CYRTIDÆ**

28. Middle tibiae with spurs; venation not complex...(p. 157) **RHAGIONIDÆ**
Tibiae without spurs; venation intricate, many veins ending before the wing-tip .................................(p. 201) **NEMESTRINIDÆ**

29. Wings rounded apically, with strong veins anteriorly and very weak, oblique ones; coxae not widely separated by the sternum. 
(p. 234) **PHORIDÆ**
Wings with normal venation or pointed at the apex, or the coxae broadly separated by the sternum ..................80

30. Wings pointed at the apex, without crossveins. 
(p. 232) **LONCHOPTERIDÆ**
31. Two or more submarginal cells, the third vein furcate..................32
   Only one submarginal cell, the third vein simple..................38
32. Front hallowed between the eyes, strongly concave from anterior view..33
   Front scarcely or not at all concave from anterior view...........34
33. At most one ocellus; at most two veins reach the wing margin behind
   the apex ..............................................................(p. 163) MYDAIIDÆ
   Three ocelli; at least four veins reach the wing margin, or extend to-
   ward it, behind the apex .........................................(p. 167) ASILIDÆ
34. Costa continuing around the wing; fourth vein ending beyond the wing-
   tip ............................................................................35
   Costa not continued beyond the apex of the wing; fourth vein ending
   before the wing-tip ..................................................(p. 161) SCENOPINIDÆ
35. Five posterior cells .....................................................36
   At most four posterior cells ...........................................37
36. Fourth vein ending before the apex of the wing...(p. 189) APIOCERIDÆ
   Fourth vein ending behind the apex of the wing...(p. 185) THEREVIDÆ
37. Anal cell open or closed near the wing margin, the anal vein reaching
   the margin .................................................................(p. 191) BOMBYLIIDÆ
   Anal cell closed far from the wing margin, the anal vein never extend-
   ing to the margin, sometimes absent.........................(p. 205) EMPIDÆ
38. Anal cell elongate, tapering and acute apically, closed near the border
   of the wing; basal cells usually elongate.........................39
   Anal cell short, transverse, oblique, or convex apically, if somewhat
   pointed the apex partly transverse, partly drawn out into a triangular
   point posteriorly ..........................................................40
39. Anal cell closed very close to the wing margin; a spurious vein running
   obliquely between the third and fourth longitudinal veins.
   (p. 247) SYRPHIDÆ
   Anal cell usually shorter; no spurious vein.........................40
40. Head extremely large, hemispherical, the front and face very narrow;
   arista dorsal ...............................................................(p. 245) PIPUNCULIDÆ
   Head not unusually large; face or front usually wide...............41
41. Frontal lunule entirely absent, the parafacials not differentiated by a
   suture ...........................................................................42
   Frontal lunule present; parafacials differentiated by a suture which ex-
   tends above the antennæ and is indistinct only in some Conopide.44
42. Anterior crossvein situated at or before the basal fourth of the wing;
   second basal and discal cells always united...(p. 215) DOLICHOPIDÆ
   Anterior crossvein situated far beyond the basal fourth of the wing or
   the second basal cell complete ........................................43
43. Anal cell pointed posteriorly; proboscis never rigid and adapted for
   piercing .................................................................(p. 242) PLATYPEZIDÆ
   Anal cell not pointed posteriorly; proboscis usually rigid; never a single
   row of acrostical hairs ..............................................(p. 205) EMPIDÆ
44. Coxæ close together at the base, the legs attached ventrally...........45
   Coxæ widely separated at the base, the legs attached toward the sides
   of the thorax; usually leathery or coriaceous flies; ectoparasites
   (Pupipara) .................................................................91
45. Second antennal segment with a longitudinal seam along the upper outer edge extending almost the whole length; posterior calli definitely formed by a depression extending from behind the base of the wings to above the base of the scutellum (Calypteratæ; Muscoidea). . . Second antennal segment rarely with a well developed dorsal seam, the posterior calli not differentiated (except in Gasterophilus); squamae small (Acalypteratæ) ............................................ 46

46. Mouth parts vestigial, sunken in a very small oral pit. (p. 400) GASTEROPHILIDÆ

Mouth parts well developed, the oral opening large......................... 47

47. Posterior spiracle with several hairs on the border in addition to the pubescence, (visible only with high magnification) ......................... 50

Posterior spiracle with pubescence only ...................................... 48

48. Subcosta complete, free from the first vein and ending in the costa (cf. Trypaneidæ) ............................................................. 64
Subcosta incomplete, or not ending in the costa or the apex curved forward beyond the bend .................. 49

49. Subcosta curved forward at nearly a right angle and weakened beyond the bend, the costa fractured at the apex of the subcosta; wings almost always pictured.(p. 285) TRUPANEIDÆ
Subcosta not angularly curved and weakened .................................. 51

50. Head broad, flattened above; scutellum and thorax flattened, the former elongate; large flies .................. (p. 299) ROPALOMERIDÆ
Head rather spherical; scutellum usually convex, not elongate; small, cylindrical flies ............................................ (p. 313) SÉPSIDÆ

51. First segment of the posterior tarsi shortened and incrassate. (p. 360) BORBORIDÆ
First segment of the posterior tarsi normal, usually longer than the second .................................................. 52

52. Anal cell absent ................................................................. 53
Anal cell present ......................................................................... 55

53. Postocellar bristles divergent .............................................(345) EPHYDRIDÆ
Postocellars convergent or absent ........................................ 54

54. Ocellar triangle large; fifth vein with a distinct curvature near the middle of the discal cell ......................... (p. 339) CHLOROPIDÆ
Ocellar triangle small; fifth vein straight or without a sharp curvature. (p. 325) DROSOPHILIDÆ

55. Costa broken at the humeral crossvein .................................. 56
Costa not broken at the humeral crossvein ..................................... 58

56. Postocellars divergent, if absent the arista absent. (p. 332) AGROMYZIDÆ
Postocellars convergent, parallel or absent, arista present ........... 57

57. A pair of convergent frontal bristles anteriorly; interfrontals often present ...................................... (p. 334) PHYLLOMYZIDÆ
Anterior frontals not convergent .............................................. (p. 325) DROSOPHILIDÆ

58. Postocellar bristles convergent ...........................................(p. 329) OPOMYZIDÆ
Postocellar bristles divergent or absent ...................................... 59
59. Ocellar triangle large and shining, reaching the anterior edge of the front ...........................................(p. 356) CANACEIDÆ
Ocellar triangle short ........................................60

60. Second vein joining the costa just beyond the apex of the first.
   (p. 328) ASTEIIDÆ
Second vein joining the costa far beyond the apex of the first........61

61. Costa fractured or weakened at the apex of the auxiliary vein........62
Costa not at all weakened........................................(p. 323) PERISCELLIDÆ

62. Oral vibrissæ present ...........................................(p. 332) AGROMYZIDÆ
Oral vibrissæ absent ........................................63

63. Sternopleural bristle present ..................................(p. 329) OPOMYZIDÆ
Sternopleural bristle absent ................................64

64. Oral vibrissæ present ........................................65
Oral vibrissæ absent ........................................66

65. Mesonotum and scutellum convex, if rather flattened the abdomen and legs not bristly ........................................66
Mesonotum and scutellum flattened; legs and abdomen conspicuously bristly ........................................(p. 376) CŒLOPIDÆ

66. Postvertical bristles divergent ................................68
Postvertical bristles convergent ................................69

67. Orbital plates bearing the frontal bristles short and oblique.
   (p. 378) HELOMYZIDÆ
Orbital plates long, extending to the anterior margin of the front or almost so ....................................(p. 371) CHYROMYIDÆ

68. Second basal and discal cells separated .............................69
Second basal and discal cells confluent.........................(p. 325) DROSOPHILIDÆ

69. Anterior half of the front with strong bristles, two to four pairs present on the front; third antennal segment short and rather orbicular, the arista subapical ........................................(p. 362) CLUSIIDÆ
At most two pairs of rather weak frontal bristles situated on the posterior half; arista sub-basal .......................70

70. Eyes round; occiput convex and prominent........(p. 310) PIOPHILIDÆ
Eyes, vertical, elongate; occiput concave; antennæ long.
   (p. 298) LONCHÆIDÆ

71. Legs long and slender, stilt-like; apical cell narrowed........72
Legs shorter and more robust, if rather long the apical cell not strongly narrowed ....................................75

72. Propleura haired ........................................76
Propleura bare in the middle ................................73

73. Pteropleura haired on whole surface........(p. 301) TANYPEZIDÆ
Pteropleura bare on anterior half; second basal cell confluent with the discal ........................................(p. 306) MICROPEZIDÆ

74. Arista apical ........................................77
Arista dorsal ........................................78

75. Apical cell closed or almost so in the wing margin; abdomen cylindrical, the genitalia usually large...............(p. 265) CONOPIDÆ
Apical cell not strongly narrowed or the abdomen short and broad.....79
76. Some or all of the tibiae with preapical dorsal bristle.
Tibiae without preapical bristle.

77. Postocellar bristles parallel, divergent or absent.
Postocellar bristles convergent.

78. Clypeus never prominent; femora with bristles.
Clypeus very prominent; femora without bristles.

79. Ovipositor flat and wide; front long and moderately narrow; head short, hemispherical, the antennae never porrect; shining blackish flies.
Ovipositor not prominent; front wide; head more or less orbicular or the front produced; antennae usually porrect; very rarely shining black.

80. Antenne situated on the eye-stalks or at their base.
Antenne situated on the front, though widely separated, regardless of the presence of eye-stalks.

81. Ocelli absent.
Ocelli present.

82. Postocellar bristles convergent or absent.
Postocellar bristles divergent or parallel.

83. Posterior femora swollen and spinose beneath; abdomen clavate; small, slender flies.
Posterior femora not swollen and spinose; abdomen short and rather broad, never clavate.

84. Presutural dorsocentrals absent or the subcostal and first veins end far apart.
Presutural dorsocentrals present or the thorax bearing very long, fine pile.

85. Metascutellum developed, appearing as a strong convexity below the scutellum; hypopleura with strong bristles.
Metascutellum weak or absent, or if developed there is only hair on the hypopleura.

86. Oral opening and mouth parts very small; hypopleura with abundant long hair.
Oral opening normal; hypopleura with a row of bristles or only short, sparse hair.

87. Scutellum extending far beyond the base of the metanotum; metascutellum never developed.
Scutellum very short; metascutellum usually strongly developed; palpi usually large.

88. Hypopleura with a row of bristles.
Hypopleura with fine, short hair or bare.

89. Apical cell strongly narrowed apically.
Apical cell not at all narrowed apically.

90. Oral vibrissae absent; mesonotum without bristles except above the wings.
Oral vibrissae present; mesonotum with bristles.
PUPIPARA AND FLIES WITHOUT OR WITH ABORTED WINGS

91. Coxae widely separated by the sternum; usually parasitic on warm blooded animals ..............................................92
Coxae approximate basally; not parasitic on warm blooded animals (except Streblidae) .........................................................95

92. Mesonotum short, resembling the abdominal segments; antennae inserted in lateral grooves .........................(p. 472) BRAULIDÆ
Mesonotum and abdomen differentiated .........................................................93

93. Head small and narrow, folding back into a groove on the mesonotum; prosternum produced .....................(p. 476) NYCTERIBIIDÆ
Head not folding back in a special groove; prosternum not produced ....94

94. Palpi broader than long; wings uniformly veined. (p. 477) STREBLIDÆ
Palpi elongate, forming a sheath for the proboscis; wing veins crowded anteriorly, weak or absent posteriorly ....(p. 473) HIPPOBOSCIDÆ

95. Antennae and mouth parts present ..............................................96
Antennae and mouth parts absent .........................................................97

96. Antennae consisting of six or more freely articulated segments .................97
Antennae consisting of at most three freely articulated segments .....103

97. Mesonotum without a complete, V-shaped suture .........................98
Mesonotum with a complete V-shaped suture .............(p. 33) TIPULIDÆ

98. Eyes meeting over the antennae ..............................................99
Eyes widely separated above the antennae ..........................101

99. Abdomen enormously swollen, the apical four segments slender; termite guests ..................................................(p. 101) CECIDOMYIDÆ
Abdomen normal ...........................................................................100

100. Scutellum and halteres present ..................................................100
Scutellum and halteres absent .........................................................101

101. Termite guests; ocelli absent; wings with several veins.
Not termite guests ........................................................................102

102. Halteres present .................................................................(p. 69) CHIRONOMIDÆ
Halteres absent ........................................................................103

103. Antennae apparently consisting of one more or less globular segment; posterior femora robust and laterally compressed. (p. 234) PHORIDÆ
Antennae with two or three quite evident segments; posterior femora not laterally compressed ........................................104

104. Frontal lunule present ..................................................................105
Frontal lunule absent .........................................................................106

105. First segment of the posterior tarsi short and swollen.
First segment of the posterior tarsi longer than the second segment
and not swollen ..................................................................................107

106. Arista with long, sparse rays ......................................................(p. 325) DROSOPHILIDÆ
Arista pubescent or bare; third antennal segment orbicular; wings mutilated by the fly ......................................................(p. 378) HELOMYZIDÆ
Superfamily Tipuloidea

These are the "Crane Flies" and include the families Tanyderidae, Ptychopteridae, Trichoceridae, Tipulidae and Anisopodidae. The first four mentioned families are characterized by the presence of a V-shaped suture on the mesonotum, and have, until recent years constituted the family Tipulidae. In the Ptychopteridae this suture is more or less obsolete posteriorly where it extends into the prepectellar depression but its form is always very well marked. The inclusion of the Anisopodidae with the Crane-Flies may be questioned by some students of the Order. I think the question is a debatable one: at any rate, the family seems to form more or less of a connecting link between the Tipulids and Mycetophilids.

The manuscript for the Tipuloidea has been prepared by Dr. C. P. Alexander and this fact assures the student of thorough and accurate keys together with the latest views on generic limits and classification. The study of this group might almost be said to be a "world apart" in the study of Diptera and I cannot fully express my gratitude to Dr. Alexander for the service he has rendered in preparing this part of the work.
Family Tanyderidæ—The Primitive Crane Flies

Generalized flies of medium size, usually with a handsomely banded wing-pattern. Mouthparts often produced. Antennæ with from 15 to 25 segments; flagellar segments simple, cylindrical. Eyes with erect setæ between ommatidia; ocelli lacking. Latero-cervical sclerites sometimes greatly elongated, short in the local species. Wings with five branches of Radius reaching the margin (*Fig. 11); most genera with one or two supernumerary crossveins in the outer radial or medial fields, these never exceeding two in any one genus, usually with a single such element. Male hypopygium with a single dististyle, usually simple, weakly bifid in the two regional genera. Aedeagus trifid.

The immature stages occur in sandy soil at margins of major streams, the larva being aquatic or nearly so.

There are 23 recent species of Tanyderidæ, distributed in 10 genera, chiefly Australasian in distribution. Two genera with three species occur in North America.

KEY TO GENERA

1. A supernumerary crossvein in cell $M_3$ of the wing (*Fig. 11).
   
   **Protoplasa** Osten Sacken
   
   Wings without supernumerary crossveins........**Protanyderus** Handlirsch

   The most important recent literature is as follows:

   Alexander, C. P.
   
   
   

   Crampton, G. C.
   
   
   
   

   Williams, Inez
   

* Plate II. Tipuloidea.
Family Ptychopteridae—The False Crane Flies

Antenna elongate, with 16 (Ptychopterinae) to 20 segments (Bittacomorphinae); flagellar segments cylindrical. Suture between prescutum and scutum obsolete—posteriorly. Wings with $R_2$ preserved as a distinct element, lying far distad, subequal in length to $R_1$; three branches of Radius reach margin; two or three branches of Media; a single Anal vein (*Fig. 12).

The immature stages occur in saturated organic earth, the larva with an elongate caudal breathing-tube, the pupae with a single greatly elongated pronotal breathing-horn.

There are two subfamilies, with 3 genera, *Ptychoptera* with 24 species, *Bittacomorphella* with 3 species, *Bittacomorpha* with 2 species. In the New World, the family is found only in the Neartic region, all genera being found on the eastern and western coasts but rare or lacking in the plains region.

**KEY TO GENERA**

1. Antennae 16-segmented; wings with cell $M_1$, present. (*Fig. 12); (*Ptychopterinae) ........................................ *Ptychoptera* Meigen
   Antennae 20-segmented; wings with cell $M_1$, lacking; (Bittacomorphinae) ........................................... 2

2. Wings with macrotrichia in distal ends of radial and medial cells; basitarsi of legs not dilated ........................................ *Bittacomorphella* Alexander
   Wings without macrotrichia in cells; basitarsi of legs conspicuously dilated ........................................ *Bittacomorpha* Westwood

The latest literature on the family:

Alexander, C. P.


* Plate II, Tipuloidea.
Family Trichoceridae—The Winter Crane Flies

Small or medium-sized flies of slender build, the antennæ elongate, setaceous. Three ocelli. Wings with m-cu lying far distad; two complete Anal veins, 2nd A very short, incurved to anal angle, slightly longer and more extended in *Diazosma*. Male hypopygium with a single dististyle, this cylindrical or with a variously developed lobe on basal portion of mesal face. Ovipositor with cerci upcurved, the convexity being on the ventral surface.

The so-called "winter crane flies" are most numerous in Spring and Fall, though sometimes abundant during mild days of Winter. They are usually found in large to small swarms in the open, but may be found in cellars, mines and similar places. The immature stages occur in decaying vegetable matter.

There are 4 valid genera with about 45 described species. *Trichocera* is essentially a genus of the northern Hemisphere; *Diazosma* is represented only by 2 species, with a wide distribution in the Holarctic region. *Paracladura* has several species in New Zealand and Chile, with a few others in eastern Asia; a single species (*trichoptera* O.S.) is found on our Pacific coast.

KEY TO GENERA

1. Wings with vein 2nd A subsinuate, not short and curved abruptly into the anal angle; north temperate .......... *Diazosma* Bergroth
   Wings with vein 2nd A short, curved abruptly into the anal angle .... 2

2. Tibial spurs present; tarsi with basitarsus longer than segments 2 and 3 taken together; (*) fig. 13; north temperate to arctic.
   
   Trichocera Meigen
   
   Tibial spurs lacking; basitarsus very short, only two or three times as long as wide, shorter than the third tarsal segment; western.
   
   Paracladura Brunetti

The most important recent literature:

Alexander, C. P.


* Plate II, Tipuloides.
Edwards, F. W.


Rhynehart, J. G.

Family Tipulidæ—The Crane Flies

The present family, commonly called "crane flies", includes slender-bodied flies, having long to very long, unusually brittle legs that break readily between the trochanter and femur. From allied families of Nematocera, they are readily told by the lack of ocelli, two Anal veins, and the presence of the so-called V-shaped suture between the mesonotal præseutum and scutum. In many species there is a closed discal (1st M₁) cell. In size, the various species show a range almost as great as that found in the entire order, from tiny flies with a wing-
length of about 2 millimeters (as *Dasymolophilus*) to gigantic forms with a wing-length in excess of 45 millimeters (*Ctenacrosselis*).

Rostrum sometimes greatly elongated, in some (*Elephantomyia: Toxorhina*) produced by a great lengthening of the front, the reduced mouthparts being at the extreme tip; in others (*Limonia: Gcranomyia*) the similarly greatly lengthened mouthparts consist chiefly of the labial palpi. In most Tipulidae the rostrum is short to very short. In many Tipulinae it is further tipped by a small nose-like point, the *nasus*. Maxillary palpi ranging in number of segments from 1 (some *Limonia* and *Hexatoma: Conosia*) to the normal number of 4. Antennae ranging in number of segments from 6 (*Hexatoma*) to 39 (*Gynoplistia: Cerovodia*); sometimes very greatly lengthened in males, being one or more times the length of the entire body (*Megistocera: Macromastix; Hexatoma: Eriocera; Rhabdomastix*); sometimes with branched flagellar segments (many Tipulinae; some Cylindromotinae; a few Limoniinae, as *Limonia: Rhipidia and Gynoplistia*); pedicel shorter than scape (except in some Eriopterine Claduraria); sometimes the basal flagellar segments united into a fusion-segment (Claduraria, Toxorhinaria). Eyes with ommatidia variable in size and coarseness; sometimes holoptic (*Limonia*), usually broadly dichoptic. Pediciini with short erect setae between ommatidia.

Pronotum sometimes lengthened (some *Limonia, Toxorhina*). Præseutum sometimes produced cephalad over pronotum (*Conosia, Trentepohlia*). Paired double dots, the *tuberculate pits*, often present, one on either side of midline on cephalic half of præseutum. *Pseudosutural foveæ* often present as shiny depressions on humeral portion of præseutum. Postnotal pleurotergite sometimes produced into a tubercle (some Tipulinae). Halteres long to very long. Legs with trochanters short, rarely lengthened (*Atarba, Rhabdomastix*); tibiae with or without terminal spurs; claws simple or variously toothed (*Limonia, Tipula*). Wings of various shapes, sometimes long and narrow, the anal angle correspondingly reduced (some *Limonia*), sometimes with the region squarely developed (*Antocha*). In cases, a pale longitudinal fold in cell Cu of wings (*Dieranoptycha*). The details of venation are not discussed here, having been thoroughly considered by the present writer in recent papers that are cited in the morphological bibliography at end of paper and which may be consulted for details. The chief premise of the interpretation of the radial field is that the so-called radial cross-vein, r, of the Comstock-Needham system, has never been developed in the Diptera, the vein that has been so interpreted in the few families where it is found being the transverse free portion of R₂. The anterior branch of the radial field is labelled R₁₂, except in the subtribe Limoni-
aria, where the free tip of vein Se₂ has migrated along vein R₁ to occupy the extreme tip of the vein. A series of diagrams (Figs. 3 to 10) indicates this tendency, which involves many hundreds of species in the vast genus Liponia. The medial and cubital fields are interpreted according to the Tillyard modification of the Comstock-Needham system.

Male hypopygium usually simple, the basistyles (coxites) bearing the dististyles (styles) at or near apex. Aedeagus and its subtending gonapophyses furnishing characters of paramount importance for specific determination. A dorsal lobe of the basistytle, the interbase, sometimes present. Ovipositor with the tergal valves ( cerci) lengthened, heavily sclerotized, usually gently to strongly upcurved, exceeding the short, straight sternal valves (hypovalvae); in a few cases (as some Tipulinae; Cylindrotominae: Styringomyia and others), the valves of the ovipositor are short and fleshy.

Tipulidae are great lovers of moist conditions, being chiefly restricted by humidity. Species have been taken within 600 miles of the North Pole, while others occur at altitudes of over 17,000 feet in Thibet. The majority of the species occupy the intermediate zone, the family being very numerous in species in all temperate parts of the World and similarly numerous in the subtropical and temperate portions of the mountainous regions of the Tropics. Lowland tropical species are fewer in number and are apt to have a very wide distribution. The lesser oceanic islands are practically devoid of the larger crane flies (Tipulinae) while having numbers of species of the small fragile Liponiiinae (as Liponia, s.l.; Styringomyia; Gononomy: Lipophleps; Trenopoliia). Under rigorous conditions, as the arctic, wind-swept coasts, high mountains and the like, species with reduced wings are frequently found, being most numerous in the female sex. The greatest reduction of wings is found in Chionea, which is virtually apterous in both sexes.

The Tipulidae of the World now include more than 6000 species, arranged in 283 genera and subgenera (Tipulinae, 76, Cylindrotominae, 9; Limoniinae, 198, the latter further distributed in the following tribes: Lechriini, 4; Limoniini, 37; Pedicini, 12; Hexatomini, 70, and Erionterini, 75). Representatives of all three subfamilies and of all tribes with the exception of the Lechriini occur in the area under consideration.

Keys available for the identification of the adult flies are very few in number. The writer’s preliminary study on the “Crane flies of New York”, is now seriously out-of-date due to the great additions made in intervening years. The forthcoming volume on Diptera in the “Insects of Connecticut” series will largely supercede the earlier work. Both of these reports are restricted to the area embraced in northeastern
North America. No keys are available for most of the groups in other regions of the continent, with the exception of the papers listed in the bibliography on certain groups of Tipulidae, which are lessened in value due to the great additions that have been made in later years.

KEYS TO SUBFAMILIES AND TRIBES, GENERA, ETC.

1. Terminal segment of maxillary palpus elongate, whiplash-like; nasus usually distinct; antennae usually with 13 segments; wings with Sc ending usually at or close to fork of M_{3+4} (1, 17 to 20); body-size usually large. (Tipulinae) ................................. 2

Terminal segment of maxillary palpus short; no distinct nasus; antennae usually with 14 or 16 segments; wings with Sc present, its extreme tip atrophied in some Cylindrotominae; vein Cu_{1} straight, not constricted at m-cu, the latter placed far before the fork of M_{3+4}, usually at or close to fork of M (21 to 44); body-size usually small or medium ...................................... 19

2. Legs unusually long and filiform; wings with vein R_{2+3} atrophied and with Sc ending in Sc close to origin of Rs (Dolichopeza, 19), when R_{1+2} is preserved (Brachypremna, 18; Tanyprema; Megistocera, 17), vein Sc is very long, Sc_{1} reaching C as a distinct element some distance beyond fork of Rs and with cell 2nd A usually very narrow (Dolichopezaria) ........................................... 3

Legs of normal stoutness for the family; wings with vein R_{2+3} preserved (20); when atrophied (a few species of Tipula) with Sc of moderate length, Sc atrophied before fork of Rs and Sc_{1} ending at or near midlength of Rs (exception, some species of Longurio); cell 2nd A of normal width ............................................. 8

3. Wings with origin of vein M_{1} basad of that of M_{1+7}; R_{2+3} angularly bent at near midlength (17); tropical, subtropical.

 Megistocera Wiedemann

Wings with origin of vein M_{1} distad of that of M_{1+7}, usually far beyond; R_{2+3} straight or nearly so, not angulated................................. 4

4. Wings with R_{1+2} pale, perpendicular to R_{2+3}; Rs strongly arcuated at origin (18) ............................................. Brachypremna Osten Sacken

Wings with R_{1+2}, when present, oblique; Rs straight or gently arcuated throughout length, sometimes very short and transverse....................... 5

5. Rs of moderate length, subequal to m-cu; Sc long, Sc atrophied, ending beyond fork of Rs; R_{2+3} pale but preserved; tropical.

 Tanyprema Osten Sacken

Rs short, transverse, simulating a crossvein, about equal in length to one-half m-cu; Sc unusually short, Sc atrophied, Sc entering Sc before to just beyond origin of Rs; R_{2+3} atrophied. (Dolichopeza) ................................. 6

6. Wings with cell 1st M_{1} open by atrophy of basal section of M_{1}, the outer medial field thus appearing pectinately branched (19); temperate ............................ Dolichopeza: Dolichopeza Curtis

Wings with cell 1st M_{1} closed ............................................. 7

7. Cells beyond cord with abundant macrotrichia; tropical.

 Dolichopeza: Megistomastix Alexander

Cells beyond cord glabrous; temperate .... Dolichopeza: Oropeza Needham
8. Antennal flagellum of male branched, of female branched or serrate; legs relatively short and stout. (Ctenophoraria) .......................... 9
Antennal flagellum simple (serrate in Prionocera, readily told by lack of antennal verticils); legs usually more slender. (Tipularia)...... 11

9. Antennae of both sexes with two short branches at extreme base of flagellar segments two to seven inclusive; tropical.

**Ozodicera**: Dihexaclonus Enderlein
Antennae of male with three or four branches on each of flagellar segments two to nine, of female merely serrate; north temperate... 10

10. Antennae of male with three pectinations on flagellar segments two to nine, each segment with a single branch on apical half, in addition to the usual basal pair; ovipositor greatly elongated, sabre-like .......................................................... Tanyptera Latreille
Antennae of male with two pairs of pectinations on flagellar segments two to nine, one pair being subbasal, the other subapical; ovipositor short and of normal Tipuline structure........... Ctenophora Meigen

11. Wings with vein R₁ bent strongly caudad before end, thence angularly deflected cephalad, cell R₁ thus being much constricted at near midlength; western and tropical..................... Holorusia Lœw
Wings with vein R₁ straight or only gently arcuata throughout its length, not constricting the cell (20)................................. 12

12. Flagellar segments without verticils, the lower face of individual segments produced to give the organ a serrate appearance; terminal flagellar segment abruptly more slender, north temperate to arctic.

**Prionocera** Lœw
Flagellar segments verticillate, simple or nearly so.................. 13

13. Abdomen in both sexes greatly elongated, somewhat resembling that of a dragon-fly; verticils of outer flagellar segments very long and conspicuous; valves (cerci) of ovipositor with smooth margins; eastern. (Longurio) .......................................................... 14
Abdomen not so elongated (except in female of Tipula longiventris Lw., which has the cerci of ovipositor serrate on margins); antennal verticils of moderate length only................................. 15

14. Wings with cell M₁ sessile.......................... Longurio: Æschnosoma Johnson
Wings with cell M₁ petiolate.......................... Longurio: Longurio Lœw

15. Wings with Rs short and oblique in position, shorter than m-cu; cell M₁ sessile or very short-petiolate; vein M₁ arising opposite or basad of origin of M₁-c; body-coloration highly polished, often black and yellow ..................................................... Nephrotomata Meigen
Wings with Rs elongate, exceeding m-cu; cell M₁ petiolate; vein M₁ arising distad of origin of M₁-c; body-coloration usually opaque, pruinose or pollinose (20). (Tipula)................................. 16

16. Wings with cell M₁ lacking; arctic.............. Tipula: Nesotipula Alexander
Wings with cell M₁ present ................................................. 17

17. Size very small (wing not exceeding 9 mm.); vein R₁-c entirely atrophied; tropical ...................... Tipula: Microtipula Alexander
Size larger (wing over 10 mm.; in species with R₁-c atrophied, wing over 12 mm.); R₁-c usually preserved.................. 18
Tipuloidea, Plate I.
EXPLANATION OF PLATE

1. Tanyptera fumipennis, venation.
2. Dicranota (Plectromyia) modesta, venation.

3-10. A series of diagrams to illustrate the modification of the outer subcostal and radial fields of the wing, as found in the Tipulinae, Cylindrotominae, Lechrini and Limoniini.

3. The type found in the Orimargaria: Sc preserved, R 1+2 complete, attaining the wing-margin.
4. A further development of 3. Sc 2 has moved distad, shortening R 1; R 1+2 still entire.
5. Condition as in 4 but with tip of R 1+2 atrophied. Found in several Orimargaria, Limoniaria.
6. An accentuation of 5. The atrophy of R 1+2 is still greater, R 1 more shortened and more or less in transverse alignment with the free tip of Sc. Condition found in numerous Limoniaria.
7. A still further modification of 5. The atrophy of R 1+2 is now complete and R 1 is in direct transverse alignment with R 2, both in turn being in transverse alignment with the free tip of Sc. This is the commonest type in the Limoniaria, being found in most members of the following subgenera of Limonia.—Dicranomyia, Geranomyia and Rhipidia, as well as in some Limonia, s.s.
8. A type that reverts back to condition 5, with a long spur of R 1+2 persisting, with the free tip of Sc 2 migrated distad along this spur to lie beyond the level of R 2. A condition found in several subgenera of Limonia, as Peripheroptera, Limonia and Libnotes.
9. A further modification of 8, where Sc 2 has migrated to the extreme tip of the spur of R 1+2 but still forms a rectangular bend. Limonia: Libnotes.
10. The culmination of the series, where the free tip of Sc 2 has migrated to the extreme tip of the spur of R 1+2 and then bends to the costal margin at a gently oblique angle. This condition is common in many Limonia of the subgenera Limonia and Discobola.

EXPLANATION OF SYMBOLS

Comstock-Needham system, as modified by Alexander and Tillyard

C = Costa; Cu = Cubitus; 1st M 2 = cell 1st M 2; M = Media; m-cu = medial-cubital crossvein; R = Radius; r-m = radial-medial crossvein; Rs = Radial sector; s = supernumerary crossvein; Sc = Subcosta; A = Anal veins.
18. Wings with macrotrichia in apical cells...Tipula: Trichotipula Alexander
Wings with cells glabrous.........................Tipula: Tipula Linnaeus

19. Wings with tip of R₁,₂ atrophied, giving the appearance of a long
fusion back from margin of veins R₁ and anterior branch of Rs; free tip of Sc, preserved (21, 22, 23) (Cylindrotominae)........... 20
Wings sometimes with tip of R₁,₂ atrophied (some Limoniini) but not
giving the appearance of a long fusion backward from margin of
veins R₁ and anterior branch of Rs; free tip of Sc, preserved in
many species of tribe Limoniini, lacking in other tribes in this
fauna (21 to 41) (Limoniinae).............................. 24

CYLINDRO TOMINÆ: GENERA

20. Head and intervals of mesonotal praescutum with numerous deep
punctures; a deep median groove on praescutum.... Triograma Schiner
Head and intervals of mesonotal praescutum smooth; no median
praescutal groove ........................................ 21

21. Three branches of Radius reach the margin, R₁,₂ being preserved as
a distinct element .......................... Phalacrocera Schiner
Two branches of Radius reach the margin, R₁,₂ being entirely
atrophied, giving the appearance of a long backward fusion of
veins R₁ and anterior branch of Rs (21-23)................... 22

22. Four branches of Media reach the margin (21) Cylindrotoma Macquart
Three branches of Media reach the margin...................... 23

23. Wings with crossvein r-m present; outer end of cell 1st M₂ almost
always closed by a single transverse vein, cell M₁ being present,
 sessile to short-petiolate; cells 2nd M₂ and M₃ confluent by atrophy
or partial atrophy of distal section of vein M₃; antennæ nearly
simple, the lower face of individual segments not produced (22,
23) ................................... Phalacrocera Schiner
Wings with crossvein r-m usually shortened to quite obliterated by
the approximation or fusion of veins R₁,₂ and M₁,₂; outer end of
cell 1st M₃ closed by two transverse veins, these being M and the
basal section of M₃; cell M₁ lacking, cells 2nd M₂ and M₃ distinct;
antennæ strongly nodulose, especially in male, the individual flagel-
lar segments nearly cordate...................... Liogma Osten Sacken

TRIBES OF LIMONIINÆ

24. Eyes hairy; wings with vein Sc, very long, Sc, lying basad of origin
of Rs (2, 30); (Pediciini).......................... 41
Eyes glabrous; wings with Sc, short or of moderate length, when
long (some Eriopterini), Sc, lying distad of origin of Rs; where
Sc, lies basad of origin of Rs (some Limoniini, Eriopterini), the
entire vein Sc is shortened......................... 25

25. Wings with free tip of Sc, often present; veins R₁ and R₂ fused to
margin, only two branches of Rs being present; antennæ usually
with 14 (Limoniaria) or 16 segments; (1-10, 21-29) (Limoniini) 27
Wings with free tip of Sc, atrophied; veins R₁ and R₂ separate, the
former usually transferred to the upper branch, R₂,₃ to form a
distinct element R₂,₃,₄; usually with three branches of Rs present
(except in Atarba, Elephantomyia, Styringomyia, Teucholabis, Go-
nomyia and Toxorhina, where R₂ is captured by R₂,₃, as above);
antennæ usually with 16 segments; (31-41).................. 26
26. Tibial spurs present. (Hexatomini) ........................................... 51
   Tibial spurs lacking. (Eriopterini) ........................................... 78

LIMONHINI: SUBTRIBES, GENERA, SUBGENERA

27. Wings with vein R 5 lacking (25) ........................................... 28
   Wings with vein R 5 present (21, 26, 29) ..................................... 29

28. Rostrum short and inconspicuous; Rs long and straight, running close
to R 1 and in alignment with R 2+3; r-m distinct. (Ellipteraria).

   Elliptera Schiner
   Rostrum of moderate length, about equal in length to remainder of
   head; Rs short, gently arcuated, not in alignment with R 2+3; r-m
   often shortened or obliterated by approximation of adjoining veins
   (25). (Helioria) ......................................................... Helius St. Fargeau

29. Wings with m-cu more than three, (and usually much more), times
   its own length before the fork of M (26). (Orimargar'a, Orimarga) 30
   Wings with m-cu close to or beyond the fork of M, if before, the
   distance not or scarcely exceeding the length of the vein itself
   (24, 27, 29) ......................................................... 31

30. Wings with three branches of Media reaching margin, cell M 3 being
   present; m-cu beneath Rs ............ Orimarga: Orimarga Osten Sacken
   Wings with two branches of Media reaching margin, cell M 3 lacking;
   m-cu far before origin of Rs (26). Orimarga: Diotrepha Osten Sacken

31. Wings with vein R 5 lying far distad, beyond level of outer end of
   cell 1st M 3; m-cu beyond fork of M (27) (Dieranoptycharia).

   Dieranoptycha Osten Sacken
   Wings with vein R 5 in almost transverse alignment with r-m and basal
   half of cell 1st M 3; m-cu at or slightly before fork of M (24,
   28, 29) ............................................................. 32

32. Wings with Rs long and straight (24, 28); antennae 16-segmented...
   Wings with Rs shorter and more arcuated (21); antennae 14-
   segmented. (Limoniaria, Limonia) ............................................ 34

33. Anal angle of wing very prominent, almost square; Rs long, diverg-
   ing at an acute angle from R 1, ending approximately between the
   branches of Rs or in alignment with R 2+3 (28) (Antocha).

   Antocha Osten Sacken
   Anal angle of wing normally rounded; Rs long, lying very close to
   R 1 and nearly parallel to it, its end in alignment with R 2+3; basal
   section of R 1 short and arcuated, diverging from the end of Rs
   at nearly a right angle (21) (Ellipteraria) Elliptera Schiner

34. Wings with M and both sections of M 3 lacking, cell M 3 thus entirely
   obliterated ................................................. Limonia: Alexandriaria Garrett
   Wings with at least the distal section of M 3 preserved and usually
   with both sections, together with m, cell M 3 thus usually present
   (29) ............................................................. 35

35. Supernumerary crossveins present in certain cells of wing ......... 36
   No supernumerary crossveins in cells of wing (excepting a weak
   element sometimes evident in cell Sc) (29) ............................ 37
Tipuloida, Plate IV.—33. Elephantomyia westwoodi, venation; 34. Atarba (Atarba) picticornis, venation; 35. Polymera (Polymera) rogersiana, venation; 36. Prolimnophila areolata, venation; 37. Toxorhina (Toxorhina) muliebris, venation; 38. Teucholabis (Teucholabis) complexa, venation; 39. Trentepohlia (Parmangoma) bromeliadica, venation; 40. Gononomyia (Gonomyia) subcinerea, venation; 41. Molophilus nitidus, venation; 42. Helobia hybrida, venation; 43. Gnophomyia tristissima, venation; 44. Erioptera (Erioptera) septemtrionis, venation.
36. Wings with Sc short, Sc, ending opposite or before origin of Rs; a supernumerary crossvein in cell R,. Limonia: Neo limnobia Alexander
Wings with Sc long, ending about opposite fork of Rs; a supernumerary crossvein in cell 1st A, connecting the Anal veins.

Limonia: Discobola Osten Sacken

37. Mouthparts, and especially the labial palpi, lengthened, the rostrum much longer than remainder of head, and usually about as long as the combined head and thorax........ Limonia: Geranomyia Haliday
Mouthparts, with the labial palpi, not notably lengthened, shorter than remainder of head ........................................ 38

38. Antennæ of male more or less branched (bipectinate, unipectinate or subpectinate), of female simply serrate, sometimes very weakly so.

Limonia: Rhipidia Meigen

Antennæ simple in both sexes........................................ 39

39. Wings of male with the prearcular region greatly developed, of female less markedly so; wing-apex very obtuse; Sc, ending approximately opposite origin of Rs; tropical.

Limonia: PeripheroPTera Schiner
Wings of both sexes with prearcicular cells small and inconspicuous; wing-tip not so obtusely (except in some Limonia, s.s., where Sc is elongate, ending beyond midlength of Rs)........ 40

40. Wings with Sc short, Sc, ending opposite or before origin of Rs.

Limonia: Dicranomyia Stephens
Wings with Sc long, Sc, ending beyond midlength of Rs (29).

Limonia: Limonia Meigen

PEDICINI: SUBTRIBES, GENERA, SUBGENERA

41. Wings with numerous macrotrichia on membrane (Ularia). Ula Haliday
Wings glabrous .................................................. 42

42. Rostrum produced into a beak that is subequal in length to remainder of head; western .................................. Ornithodes Coquillett
Rostrum only inconspicuously developed ........................................ 43

43. Antennæ with usually 16 segments; size large, wing usually over 10 mm. (Pedicia) ........................................ 44
Antennæ with usually 13 or 15 segments; size small, wing usually under 8 mm. ........................................ 45

44. Size very large (wing, 20 mm. or more); wings with a dark pattern that is arranged as a triangle, including broad costal and cubital seams that are connected across the very oblique cord; maxillary palpus with terminal segment elongate..... Pedicia: Pedicia Latreille
Size smaller (wing, under 18 mm.); wings without a dark pattern arranged as a triangle, as above described; cord of wing transverse or nearly so (30); maxillary palpus with terminal segment short .............. Pedicia: Tricyphona Zetterstedt

45. Wings with four supernumerary crossveins, located in cells R, R, R, and M; western .................................. Polyangaeus Doane
Wings with at most a single supernumerary crossvein, this in cell R, basad of vein R, (Dicranota) ........................................ 46

46. A supernumerary crossvein in cell R, about opposite end of vein Sc, 47
No supernumerary crossveins in cells of wing.................................. 49
47. Cell 1st M₂ closed; eastern.............. Dicranota: Eudicranota subg. n.  
   Cell 1st M₂ open by atrophy of m............................... 48

   Cell M₁ present.......................... Dicranota: Dicranota Zetterstedt

49. Cell 1st M₂ closed; eastern ........ Dicranota: Amalopina Brunetti  
   Cell 1st M₂ open by atrophy of m............................... 50

50. Cell M₁ lacking (2).................. Dicranota: Plectromyia Osten Sacken  
   Cell M₁ present ...................... Dicranota: Rhaphidoiabis Osten Sacken

HEXATOMINI: SUBTRIBES, GENERA, SUBGENERA

51. Antennae with not more than 12 segments (Hexatomaria, Hexatoma). 52
   Antennae with more than 14 segments ...................... 54

52. Cell 1st M₂ open; two branches of M reach the wing-margin (31);  
   eastern.................................. Hexatoma: Hexatoma Latreille  
   Cell 1st M₂ closed; three or four branches of M reach the wing-  
   margin (32).................................. 53

53. Feet snowy-white; eastern and tropical. Hexatoma: Penthoptera Schiner  
   Feet not white (32)....................... Hexatoma: Eriocera Macquart

54. Wings with only two branches of Rs present; vein R₂ lacking....... 55
   Wings with three branches of Rs present; vein R₂ preserved (except  
   in Phyllolabis) ................................ 56

55. Rostrum elongate, exceeding one-half the length of the entire body  
   (33); (Elephantomyaria)............... Elephantomyia Osten Sacken  
   Rostrum short and inconspicuous, not exceeding the remainder of head  
   (34); eastern and tropical (Atarbaria).  
   Atarba: Atarba Osten Sacken

56. Apical cells of wing with macrotrichia .......................... 57
   Cells of wing without macrotrichia (excepting in stigmal area)..... 61

57. A supernumerary crossvein in cell M; eastern (Limnophilaria).  
   Limnophila: Trichephelia Alexander  
   No supernumerary crossvein in cell M ................................ 58

58. Cell R₃ of wings sessile, subsessile or short-petiolate; R₃₊₄, lacking  
   or much shorter than m-cu. (Limnophilaria) ...................... 59
   Cell R₃ of wings long-petiolate, R₃₊₄ being as long as or longer than  
   m-cu. .................................... 60

59. Wings with macrotrichia abundant, involving the cells basad of cord.  
   Ulomorpha Osten Sacken  
   Wings with sparse macrotrichia in cells beyond cord only.  
   Limnophila: Lasiomastix Osten Sacken

60. Small species (wing, c', less than 5 mm.); cell M, usually present; an-  
   tennae short in both sexes (Adelphomyaria)........ Adelphomyia Bergroth  
   Larger flies (wing, c', over 6 mm.); cell M, lacking; antennae of male  
   very long; tropical (Limnophilaria) ......................... Shannonomyia Alexander

61. A supernumerary crossvein in cell C (Epiphragmaria).  
   Epiphragma Osten Sacken  
   No supernumerary crossvein in cell C (35).......................... 62
62. Wings with vein $R_2$ lacking; m-cu at outer end of cell 1st $M_3$; western.  
Phyllolabia Osten Sacken  
Wings with vein $R_2$ present; m-cu at or before two-thirds the length of cell 1st $M_3$, when the latter is present (35, 36).............. 63

63. Wings with cell 1st $M_3$ open by atrophy of m (35); male with elongate nodulose antennae; tropical and subtropical.  
Polymera: Polymera Wiedemann  
Wings with cell 1st $M_3$ closed; antennae of male not nodulose........ 64

64. Wings with Sc very long, Sc., $R_{1-2}$ and $R_2$ all ending close together at costal margin; tropical ..................Psaronius Enderlein  
Wings with Sc short, widely separated from either $R_{1-2}$ or $R_3$ (36)... 65

65. Wings with m-cu at or close to fork of $M$; anterior arculus lacking.  
(Dactylohabararia) ..................Dactylohabararia Osten Sacken  
Wings with m-cu beyond the fork of $M$, at from one-third to about one-half the length of cell 1st $M_3$; where close to fork of $M$ (some Pseudolimnophila) the arculus complete..................... 66

66. Wings with the anterior arculus lacking (36) (Pseudolimnophilaria, in part) .................................................. 67  
Wings with the anterior arculus present ................................ 68

67. Cell 1st $M_3$ of wings very large, its inner end lying far proximad of the other elements of the cord (36).............Prolimnophila Alexander  
Cell 1st $M_3$ of wings of normal size, its inner end straight and in approximate alignment with the elements of the anterior cord.  
Archilimnophila, g. n.

68. Wings with Sc relatively short, Sc., ending before the level of the fork of $Rs$; where slightly longer (Limnophila albipes Leonard) the posterior tarsi snowy-white. (Limnophilaria, in part).................. 69  
Wings with Sc longer, Sc., ending opposite or beyond the fork of $Rs$; (compare some species of Pilaria, distinguished by having the antennal verticils of unusual length) ................................. 70

69. Antennae with long conspicuous verticils; tuberculate pits present, small, placed at extreme cephalic end of prescutum; Rs elongate, exceeding vein $R_2$; cell $M_1$ present or lacking.........Pilaria Sintenis  
Antennae with short verticils; tuberculate pits lacking; Rs short and strongly arcuated or angulated at origin; cell $M_1$ lacking.  
Shannonomyia Alexander

70. Head strongly narrowed and prolonged behind; radial and medial veins beyond cord long and sinuous; vein $R_2$ extending generally parallel to vein $R_1$, not diverging markedly at tips; vein 2nd A strongly curved to margin (Pseudolimnophilaria, in part).  
Pseudolimnophila Alexander  
Head broad, not conspicuously narrowed behind; radial and medial veins beyond cord more nearly straight; vein $R_2$, diverging strongly from vein $R_1$, cell $R_1$ conspicuously widened at margin; vein 2nd A not curved strongly into margin (Limnophilaria, in part, Limnophila).

71. Supernumerary crossveins in either cell $R_3$ or cell $M$ of wing....... 72  
No supernumerary crossveins in cells of wing.................... 74
72. A supernumerary cross vein in cell R₂; eastern.  
Limnophila: Dieranophragma Osten Sacken
A supernumerary cross vein in cell M............................... 73

73. Rs long-spurred at origin; antennae of male elongate.  
Limnophila: Idioptera Macquart
Rs slightly if at all spurred at origin; antennae short in both sexes.  
Limnophila: Elaeophila Rondani

74. Cell R₂ sessile; cell M₁ lacking.……Limnophila: Idiolimnophila, subg. n.  
Cell R₂ petiolate; cell M₁ present................................. 75

75. Very large species (wing over 16 mm.); wings with the branches of  
M leaving the main stem at a strong angle, cell 1st M₂ thus being  
strongly hexagonal; eastern.……Limnophila: Eutonia Van der Wulp
Smaller species (wing under 14 mm.); wings with the branches of  
M not strongly divergent, especially M₃,₄, 1st M₁ being more  
neatly rectangular in outline........................................... 76

76. Wings with vein R₂₊₄ short, subequal to the basal deflection of R₂;  
Rs elongate, exceeding four times R₂₊₄; coloration polished black  
or gray, the latter group having the male hypopygium with a series  
of teeth on margin of outer dististyle, producing a comb-like  
appearance ..........................................................Limnophila: Prionolabis Osten Sacken
Wings with R₂₊₄ longer, usually exceeding the basal deflection of  
R₂; Rs shorter, not exceeding three times R₂₊₄; where the above  
characters are doubtful, the species have a closely irrorate brown  
wing-pattern; body coloration never polished black; when gray,  
male hypopygium without a comb of spines on outer dististyle.…… 77

77. Rs short, weakly to more strongly angulated at origin, more rarely  
merely arcuated; R₂₊₄ subequal to or shorter than m-cu; an-  
tennae short in both sexes.……Limnophila: Phylidorea Bigot
Rs longer, more gently arcuated; in species with shorter Rs, antennae  
of male elongate and usually with R₂₊₄ long, considerably exceed-  
ing m-cu..........................Limnophila: aberrant species

ERIOPTERINI: SUBTRIBES, GENERA, SUBGENERA

78. Nearly aperogous, the wings reduced to microscopic structures that  
are smaller than the halteres; northern. (Claduraria).Chionea Dalman
Fully-winged species .................................................. 79

79. Wings with cell M₁ present ............................................ 80
Wings with cell M₁ lacking (37-44).................................... 84

80. Antennae with the basal two to four segments united into a fusion- 
segment; wings with R₂₊₄₊₅, much longer than the short basal section  
of R₂; veins Sc₁ and R₁₊₂ widely separated at margin, the distance  
on Costa between them approximately three times r-m; legs plainly  
colored; temperate. (Claduraria)........................................... 81
Antennae with all flagellar segments distinct; wings with basal sec- 
tion of R₂, elongate, much exceeding R₂₊₄₊₅; veins Sc₁ and R₁₊₂  
closely approximated at margin, the distance on costa between them  
subequal to or shorter than r-m; legs conspicuously hairy, banded  
with black, rufous and white; tropical. (Lecteriaria).
Lecteria Osten Sacken
81. Wings with R_{2+3+4} subequal to or longer than vein R_{3}, cell R_{5} thus being subequal to its petiole; vein R_{5} at or before the fork of R_{2+4}.

Neolimmophila Alexander

Wings with R_{2+4} shorter than vein R_{3}, cell R_{5} being much longer than its petiole; R_{5} far beyond fork of R_{2+4}.......................... 82

82. Wings with cell M_{1} very small, about one-third its petiole; fusion-segment of antenna very long, about equal to the succeeding four segments combined; western...........................Pterochionea Alexander

Wings with cell M_{1} subequal to or longer than its petiole; fusion-segment of antenna shorter, about as long as the succeeding two or three segments combined. (Cladura).......................... 83

83. Wings with R_{1-2} elongate, exceeding R_{2-4}; R_{2-3} subequal to m-cu; male hypopygium with two dististyles. (Cladura: Neocludura Alexander)

Wings with R_{1-2} shorter than R_{2-4}; R_{2-3} approximately twice m-cu; male hypopygium with a single powerful dististyle. (Cladura: Cladura Osten Sacken)

84. Rostrum very long and slender, approximately one-half the entire body or longer; setae of legs profoundly bifid (Toxorhinaria, Toxorhina)................................................................. 85

Rostrum short, not exceeding remainder of head; setae of legs simple. 86

85. Wings with Rs having a single branch (37); eastern and tropical.

Toxorhina: Toxorhina Osten Sacken

Wings with Rs having two branches; tropical.

Toxorhina: Ceratocheilus Weschéc

86. Two branches of Rs reach the wing-margin (38).......................... 87

Three branches of Rs reach the wing-margin (39-41)...................... 89

87. Wings with R_{4} ending before midlength; anterior branch of Rs diverging strongly from posterior branch, arising at or close to r-m, straight and oblique; tropical. (Styringomyaria). (Styringomyia) Léw

Wings with R_{4} ending about opposite two-thirds their length; branches of Rs subparallel on basal half. (Gonomyaria).................. 88

88. Wings with R_{7} present, close to fork of Rs; Sc usually long, Sc_{1} ending beyond origin of Rs (38); some eastern, but chiefly tropical..........................................................Teucholabis: Teucholabis Osten Sacken

Wings with R_{7} lacking; Sc short, Sc_{1} ending opposite or before origin of Rs; chiefly tropical (Gonomyaria)...Gonomyia: Lipopheps Bergroth

89. Wings with R_{4} fused with M_{1-2} to form the entire cephalic face of cell 1st M_{2}, r-m thus obliterated; only two branches of M reach the margin; vein 2nd A very short (39); tropical. (Trentepohliaria).

Trentepohlia: Paramongoma Brunetti

Wings with R_{4} entirely distinct from M_{1-2}, being separated by the r-m crossvein (the veins fused only in a few species of Paratropesesa, where the alternative characters hold); three branches of M reach the margin; vein 2nd A of normal length (40-11).................. 90

90. Wings with cell R_{2} short, vein R_{2} shorter than the petiole of cell R_{3}

(40) .................. 91

Wings with cell R_{2} deep, vein R_{2} longer than the petiole of cell R_{3}

(42-44); shortest in Progonomyia and Empedomorpha.................. 99
91. Wings with vein R\(_2\) present ........................................ 92
   Wings with vein R\(_2\) lacking ........................................ 95

92. R\(_2\) at end of Rs, in alignment with the other elements of the cord;
   r-m obliterated by the long fusion of veins R\(_{45}\) and M\(_{1+2}\); tropical.
   (Gonomyaria) .................................................. 92
   Teucholabis: Paratropesa Schiner
   R\(_2\) its length or more beyond the fork of Rs, R\(_{2+3+4}\) subequal to or
   longer than R\(_3\); r-m distinct .................................. 93

93. Wings with Rs long and straight, exceeding the distal section of
   M\(_{1+2}\); tuberculate pits on cephalic portion of præscutum; trochanters
   elongate; arctic and subarctic. (Rhabdomastix).
   Rhabdomastix: Sacandaga Alexander
   Wings with Rs shorter, less than the distal section of M\(_{1+2}\); tubercu-
   late pits removed from cephalic margin of præscutum; trochanters
   short. (Erioptera) ............................................. 94

94. Wings with veins R\(_3\) and R\(_4\) strongly diverging, cell R\(_3\) having a
   Gonomyia-like shape ........................................... 94
   Erioptera: Gonempeda Alexander
   Wings with veins R\(_2\) and R\(_4\) more generally parallel, cell R\(_3\) having
   the more normal Erioptera-shape, but shorter.
   Erioptera: Empeda Osten Sacken

95. Wings with Sc long, Sc\(_1\) extending to near opposite or beyond mid-
   length of Rs; m-cu at or beyond fork of M. (Eriopteraria, Rhab-
   domastix) .......................................................... 96
   Wings with Sc short, not extending to beyond midlength of Rs; if
   Sc is relatively long (Ptilostena), m-cu lies more than its own
   length before the fork of M. (Gonomyaria, Gonomyia) ........... 97

96. Antennæ of male longer than body; chiefly tropical
   Rhabdomastix: Rhabdomastix Skuse
   Antennæ of male scarcely attaining wing-root; chiefly temperate.
   Rhabdomastix: Sacandaga Alexander

97. Wings with m-cu more than its own length before form of M.
   Gonomyia: Ptilostena Bergroth
   Wings with m-cu at or very close to fork of M (40) ............... 98

98. Wings with cell R\(_3\) very small, at margin subequal in extent to cell
   R\(_2\); antennal verticils long and conspicuous.
   Gonomyia: Lipophleps Bergroth
   Wings with cell R\(_3\) larger, at margin considerably exceeding in extent
   cell R\(_2\); antennal verticils not conspicuously elongated.
   Gonomyia: Gonomyia Meigen

99. Wings with distinct macrotrichia in outer cells .................... 100
   Wings with the outer cells glabrous ................................ 103

100. Wings with Rs shortened, its union with R\(_2+3+4\) forming an angle, so
    cell R\(_1\) is nearly equilateral in outline; chiefly tropical. (Eriop-
    teraria) ........................................................ 100
    Cryptolabis Osten Sacken
    Wings with Rs long, normal in position, cell R\(_1\) elongate .......... 101

101. Size very small (wing, 3 mm. or less); Rs ending in cell R\(_3\), this cell
    thus being sessile, without element R\(_2+3+4\); temperate. (Eriop-
    teraria) ........................................................ 101
    Dasymophillus Goetghhebuer
    Size larger (wing over 4 mm.); Rs ending in cell R\(_3\), cell R\(_3\) being
    petiolate by the presence of a distinct element R\(_2+3+4\) .......... 102
102. Wings with Sc, close to tip of Sc, the two veins thus being subequal in length or nearly so. (Gonomyaria)........GNOPHYMIA Osten Sacken
Wings with Sc, far removed from tip of Sc, the latter vein long, subequal in length to Rs; temperate. (Eriopteraria)........ORMOSIA Rondani

103. Wings with Rs ending in cell R, there being no element Rs+2+3+4 (11)
(Eriopteraria)..................MOLOPHILUS Curtis
Wings with Rs ending in cell R, cell R, being petiolate by a distinct element Rs+2+3+4 (42-44)...........................104

104. Wings with a supernumerary crossvein in cell R; vein 2nd A strongly sinuate (42). (Eriopteraria)...........HELIOBIA St. Fargeau
Wings without a supernumerary crossvein in cell R; vein 2nd A straight or simply sinuous (43, 44)...........................105

105. Wings with veins R, and R, divergent, unequal in length, R, being less than two-thirds R, cell R, at margin much more extensive than cell R. ..................106
Wings with veins R, and R, nearly equal in length, or with R, exceeding three-fourths of the length of R, the veins extending generally parallel to one another to the margin; cell R, at margin wider than cell R,..........................107

106. Wings with veins R, and R, very unequal in length, widely divergent or sprawling, R, being only about one-fourth R, and ending in costa close to vein R+2; cell R, at margin some eight times as wide as cell R; tropical..................NEOGNOPHYMIA Alexander
Wings with veins R, and R, less conspicuously unequal, R, being about one-half R; cell R, at margin some three or four times as wide as cell R,; tropical and subtropical. (Gonomyia).
Gonomyia: Progonomyia Alexander

107. Antennae of both sexes with the flagellar segments more or less kidney-shaped to give a nodulose appearance to the organ; large species (wing, 15 mm. or more); tropical. (Sigmatomeraria).

SIGMATOMERA Osten Sacken
Antennae of both sexes simple or nearly so, not nodulose; smaller (wing less than 12 mm., usually less than 10 mm.) ..............108

108. Coxae of middle and hind legs only slightly separated by the small meral region; wings with Sc, relatively short, not exceeding one-third the length of Rs. ..................109
Coxae of middle and hind legs widely separated by a large "pot-bellied" meral region; wings with Sc, very long, exceeding one-half the length of Rs. (Eriopteraria)..........................110

109. Wings with Rs in alignment with R+2+3; Sc short, Sc, ending opposite the fork of Rs and far before R; Sc, and Sc, subequal; male hypopygium with interbasal structures conspicuously developed as blackened spines; temperate..................LIPSOXTHRIX Leów
Wings with Rs in approximate alignment with R; Sc long, Sc, ending opposite or shortly before R, at or beyond midlength of R+2+3; Sc, much longer than Sc, (43); male hypopygium without evident interbases ..................GNOPHYMIA Osten Sacken

110. Wings with R, far before fork of Rs+2, at or just beyond the fork of Rs; male with a very large hairy stigmal region that more or less distorts the adjoining veins; western plains. EMPEDOMORPHA Alexander
Wings with R, beyond the fork of Rs+2; stigma normal.............111
111. Wings with vein Cu₄ nearly straight, its distal section not swinging cephalad toward wing-tip; cell 1st M₂ small, less than one-half the distal section of M₁+₂; terminal three segments of antennae smaller than the remainder of flagellum. Trimicra Osten Sacken

Wings with vein Cu₄ having its distal section slightly deflected at apex toward wing-tip; cell 1st M₂, when present, elongate, subequal to or longer than the distal section of M₁+₂; flagellar segments becoming progressively smaller to outer end (44) (Erioptera)....112

112. Wings with vein 2nd A arcuated so cell 1st A at midlength is as broad as, or broader than it is at margin; cell 1st M₁ opening into cell 2nd M₂ by atrophy of m; (44); chiefly temperate. Erioptera: Erioptera Meigen

Wings with anal veins divergent, cell 1st A being widest at margin; cell 1st M₁ generally closed.............................113

113. Wings with cell 1st M₂ open.........................................................114

Wings with cell 1st M₂ closed, the basal section of M₂ greatly exceeding m in length ...........................................115

114. Wings with cell 1st M₂ opening into cell M₃ by atrophy of basal section of M₃; where closed, the elements closing outer end not greatly disproportionate in length, m being one-half or more of M₃; chiefly tropical .................................Erioptera: Mesocyphona Osten Sacken

Wings with cell 1st M₂ opening into cell 2nd M₂ by atrophy of m; northern and western......................Erioptera: Psiloconopa Zetterstedt

115. Wings with a spur from the basal section of vein M₃, jutting basad into cell 1st M₂.....................Erioptera: Hoplolabis Osten Sacken

Wings with no such spur as described.............Erioptera: Ilisia Rondani

SUPPLEMENTARY KEY TO THE SUBAPTEROUS TIPULIDÆ

1. Frontal prolongation of head with nasus (Tipulinæ) ......Tipula Linnaeus

Frontal prolongation of head (or rostrum) without nasus.............. 2

2. Eyes with numerous short erect setae between ommatidia (Pediciini). Tricyphona Zetterstedt

Eyes without setae .................................................................3

3. Tibial spurs present. (Hexatomini) .........................Limnophila Macquart

Tibial spurs lacking. (Eriopterini) .........................Chionea Dalman

TYPE SPECIES OF THE NEW GENERA AND SUBGENERA PROPOSED

Dicranota: Eudicranota; type, Dicranota notabilis Alexander.

Dicranota: Paradicranota; type, Dicranota rivularis Osten Sacken.

Archilimnophila; type, Limnophila unica Osten Sacken.

Limnophila: Idiolimnophila; type, Limnophila emmelina Alexander.
FAMILY TIPULIDÆ—THE CRANE FLIES

BIBLIOGRAPHY OF IMMATURE STAGES

Alexander, C. P.


Rogers, J. S.


BIBLIOGRAPHY OF KEYS TO SPECIES OF NORTH AMERICAN TIPULIDÆ

The genera of which Keys are given follow the reference and the regions covered are indicated: Neo., Neotropical; Nea., Nearctic.

Alexander, C. P.


1913a. New Neotropical Antochini. Psyche, XX, pp. 40-54, 1 pl. (Orimarga; Toxorhina, Neo.).

1913b. A synopsis of part of the Neotropical crane-flies of the subfamily Limnobiinae. Proc. United States Nat. Mus., XLIV, pp. 481-549, 4 pls. (Epiphragma; Polymera; Lecteria; Trentepohlia; Gonomyia; Gnophomyia; Cryptolabis; Molophilus; Erioptera; Mesocyphona, Neo.).


1914a. New or little-known Neotropical Hexatomini. Psyche, XXI, pp. 33-45, 1 pl. (Hexatoma: Eriocera, Penthoperta, Neo.).


Alexander, C. P. (Continued)

*(Limnophila: Prionolabis, part: Nea.)*

*(Hexatoma: Eriocera)*

*(Dieranota: Rhaphidolabis; Gonomyia, Nea.)*

*(Erioptera: Empeda, Nea.)*

*(Dicranopycha)*

*(Trentepohlia, part; Gnomomyia, s.L)*

*(Tanyptera; Ctenophora; Nephrotoma; Tipula; Dolichopeza; Oropeza; Phalacrocer; Cylindrotoma; Limonia: Dicranomyia, Rhipidia, Geranomyia, Limonia; Helius; Dicranopycha; Pedicia; Pedieia, Tricyphona; Dieranota: Dieranota, Rhaphidolabis; Ula; Adelphomyia; Epiphragma; Limnophila, s.L; Eriocera; Chionea; Cladura; Gonomyia; Teucholabis; Rhabdomastix; Molophilus; Ormosia; Erioptera; Toxorhina)*

*(Uolomorpha)*

*(Polymera, part, Neo.)*

*(Atarba; Nea., Neo.)*

*(Gonomyia, part, Neo.)*

*(Limnophila: Elaoophila)*

*(Pedieia, Nea.)*

*(Sigmatomera)*
Dietz, W. G.

Doane, R. W.

Garrett, C. B. D.

Hine, J. S.
Johnson, C. W.
(Dolichopeza: Oropeza, Nea.)

Osten Sacken, C. R.
(Limonia: Geranomyia, Diceranomyia, Rhipidia, Limonia; Pedicia: Tricyphona; Limnophila; Eriocera; Gonomyia; Ormosia; Erioptera).
(Nephrotoma; Hexatoma: Eriocera, Neo.)

GENERAL BIBLIOGRAPHY OF MORPHOLOGICAL TERMS OF ESPECIAL VALUE IN A STUDY OF THE TIPULIDAE.

Alexander, C. P.
1929. A comparison of the systems of nomenclature that have been applied to the radial field of the wing in the Diptera. IVth Internat. Congress Ent., Trans., II, pp. 700-707, 3 pis.

Cole, F. R.

Crampton, G. C.
1923b. Preliminary note on the terminology applied to the parts of an insect’s leg. Canadian Ent., LV, pp. 126-132, 1 pl.

Snodgrass, R. E.
SYSTEMATIC ARRANGEMENT OF GENERA AND SUBGENERA, WITH
CITATIONS TO THE ABOVE BIBLIOGRAPHY OF KEYS

Tipulinae

Ctenophora (Alexander, 1919c)
Tanyptera (Alexander, 1919c)
Nephrotoma (Alexander, 1919c; Dietz, 1918; Doane, 1908b; Osten Sacken, 1886.)

Tipula, s.l. (Alexander, 1919c; Dietz, 1913, 1914, 1917, 1919, 1921a, 1921b.)

Brachypremna (Alexander, 1912b)
Tanyptrema (Alexander, 1914b)

Dolichopeza: Oropeza (Alexander, 1919c; Johnson, 1909)

Cylindrotominae

Phalacrocerca (Alexander, 1919c)

Cylindrotoma (Alexander, 1919c)

Limeniinae

Limenini

Limonia: Limonia (Alexander, 1919c; Osten Sacken, 1869)

Dicranomyia (Alexander, 1912c, 1919c; Doane, 1908a; Osten Sacken, 1869)

Alexandriaria (Garrett, 1922)

Peripheroptera (Alexander, 1913c)

Rhipidia (Alexander, 1912a, 1919c; Osten Sacken, 1869)

Geranomyia (Alexander, 1919c; Osten Sacken, 1869)

Orimharga: Orimarga (Alexander, 1913a)

Dicranoptycha (Alexander, 1919a, 1919c)

Helius (Alexander, 1919c)

Pedicini

Pedicia: Pedicia (Alexander, 1919c, 1929; Hine, 1903)

Tricyphona (Alexander, 1919c; Osten Sacken, 1869)

Dicranota: Dicranota (Alexander, 1919c)

Rhaphidolabis (Alexander, 1916a, 1919c)

Plectromyia (Alexander, 1919c)

Ula (Alexander, 1919c)

Hexatomini

Adelphomyia (Alexander, 1919c)

Epiphragma (Alexander, 1913b, 1919c)

Polymera (Alexander, 1913b, 1920b)

Daetyloclabia (Alexander, 1919c; Osten Sacken, 1869)

Pseudolimnophila (Alexander, 1919c)

Limnophila, s.l. (Alexander, 1919c; Osten Sacken, 1869)

Prionolabis (Alexander, 1919a, 1919c; Osten Sacken, 1869)

Eutonia (Alexander, 1919c)

Lasiomastix (Alexander, 1919c; Osten Sacken, 1869)

Phylidorea (Alexander, 1919c)

Eleaophila (Alexander, 1919c, 1927; Osten Sacken, 1869)

Idioptera (Alexander, 1919c)

Dicranophragma (Alexander, 1919c)

Pilaria (Alexander, 1919c)

Ulomorpha (Alexander, 1920a)
Psaronius (Alexander, 1914c)
Hexatoma: Eriocera (Alexander, 1914a, 1915, 1916b, 1919c; Osten Sacken, 1869, 1886)
Penthogetra (Alexander, 1914a)
Atarba: Atarba (Alexander, 1926a)

Eriopterini
Chionea (Alexander, 1919c)
Cladura, s.l. (Alexander, 1919c)
Lecteria (Alexander, 1913b)
Sigmatomera (Alexander, 1914c, 1930)
Trentepohlia: Paramongoma (Alexander, 1913b, 1914c, 1919b)
Teucholabis: Teucholabis (Alexander, 1914c, 1919c)
Paratropesa (Alexander, 1913c)
Gonomyia, s.l. (Alexander, 1916c, 1919c; Osten Sacken, 1869)
Progonomyia (Alexander, 1916c)
Lipophleps (Alexander, 1914c, 1916c, 1919c)
Gonomyia (Alexander, 1913b, 1916c, 1919c, 1926b; Osten Sacken, 1869)
Ptilostena (Alexander, 1916c)
Gnophomyia, s.l. (Alexander, 1913b, 1919b)
Rhabdomastix: Sacandaga (Alexander, 1919c)
Erioptera, s.l. (Alexander, 1919c; Osten Sacken, 1869)
Erioptera (Alexander, 1919c; Osten Sacken, 1869)
Mesocypkena (Alexander, 1913b, 1919c; Osten Sacken, 1869)
Ilisia (Alexander, 1919c)
Empeda (Alexander, 1917, 1919c)
Cryptolabis (Alexander, 1913b)
Ormosia (Alexander, 1919c; Dietz, 1916; Doane, 1908c; Osten Sacken, 1869)
Molophilus (Alexander, 1913c, 1919c)
Toxorhina: Toxorhina (Alexander, 1913a, 1919c)
Family Anisopodidæ

Moderately small, elongate flies with long legs and three ocelli.

Head subspherical or hemispherical, the eyes of the males holoptic or dichoptic, usually rounded. Proboscis moderately prominent, with small labella; palpi long, four segmented. Antennæ usually about as long as the thorax, cylindrical, composed of twelve to sixteen segments. Thorax convex, without distinct transverse suture; scutellum semi-circular, short and broad, the metanotum well developed. Abdomen more or less cylindrical, flattened below, the genitalia small. Legs slender, without spines; anterior coxae and the basal segment of the tarsi elongated; tibiae with or without apical spurs; pulvilli absent, the empodia pad-like. Wings rather large, lying flat on the abdomen when at rest; auxiliary vein present; radius with 3 or 4 (Axymyia, Fig. 15*) branches; cell 1st M₂ closed or open (Figs. 14, 16*); a single anal vein reaches the margin.

The adults are frequently common, particularly those belonging to the genus Anisopus which sometimes occur in small swarms near the edges of woods in the vicinity of swamps and also on the trunks of trees. The other genera occur in moist places, particularly upon foliage. The members of this family, insofar as known, breed in wet or moist decaying organic matter, as fermenting sap, rotten wood and similar situations.

There are about 80 described species, distributed in 6 genera and 3 subfamilies, all of the latter being found in the North American fauna.

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* Plate II, Tipuloidea.

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Fig. 1. Anisopus species.  
Fig. 2. Olbiogaster species.
KEY TO GENERA

1. Wings with cell 1st M$_2$ present. (Anisopodinae).......................... 2
Wings with cell 1st M$_2$ open by the atrophy of basal section of M$_3$.... 3

2. Wing-membrane with macrotrichia (14$^*$; also 1); posterior tibia with a
comb of spinous setae .................................................. Anisopus Meigen
Wing-membrane without macrotrichia; posterior tibia without spinous
comb; tropical (2).................................................. Olbiogaster Osten Sacken

3. Wings with vein R$_3$ present as a nearly transverse element, connecting
with vein R$_1+2$ at margin (15$^*$); eastern (Axymyiinae). Axymyia McAtee
Wings with vein R$_3$ lost by atrophy, there being only two branches of
Rs (16$^*$); north temperate (Mycetobiinae).......................... Mycetobia Meigen

The most important paper:

Edwards, F. W.
1928. Diptera. Fam. Protorhyphidae, Anisopodidae, Pachyneuridae, Tri-
choceridae. Genera Insectorum, Fasc. 190, pp. 1-41, 2 pls.

* Plate II. Tipuloidea.
Family Blephariceridae—The Net-Winged Midges

Moderate sized, elongate, nearly bare species with long legs and rather wide, delicate wings.

Eyes sometimes holoptic in one or both sexes and usually bisected below the middle by a narrow, unfaceted line below which the facets are smaller; three ocelli present. Antennae slender, composed of nine to fifteen segments and clothed with pubescence. Mouth parts more or less elongate, the females with slender, flattened elongate serrate mandibles. Mosontum with distinct, broadly interrupted transverse suture. Legs rather slender, the posterior pair longer than the others; tibiae with or without spurs; pulvilli and empodium absent or nearly so. Wings broad, bare, the anal angle projecting, almost always with a network of delicate lines due to the creasing of the folded wings in the pupal case.

The adults are not common in most collections but are often found in large numbers near fast-flowing streams. I have found them chiefly on the foliage of evergreens or on the sides of cliffs or rocks.
The larvae live in swift water, clinging to the rocks or stream bed by a series of ventral suckers, pupation taking place in the stream. The immature stages are even more easily identified than the adults. The latest revision of the family is contained in Williston's Manual of North American Diptera, 3rd edition.

KEY TO GENERA

1. An incomplete longitudinal vein between the fourth and fifth longi- tudinals (1) ................................................................. 3
   No incomplete vein between these veins (2).......................... 2

2. Proboscis long; palpi but little developed (2, 5)........... Paltostoma Schiner
   Proboscis not longer than the vertical diameter of the head; palpi well
developed, four-segmented ........................................... Kelloggina Williston

3. Second basal cell closed apically........................................ 4
   Second basal cell open apically (1) ............................... Blepharicera Macquart

4. Second longitudinal vein branched, the branch either simulating a cross-
   vein near the base of the second vein, or elongate............. 5
   Second vein not branched (3)........................................ Philorus Kellogg

5. Pleura pilose or haired (4)................................. *Bibiocephala Osten Sacken
   Pleura bare ........................................................... Agathon Röder

* Bibionus Curran is a synonym but the two species upon which the genera were based
are distinct.

Blephariceridae.—1. Blepharicera; 2, Paltostoma; 3, Philorus; 4, Bibio-
cephala; 5, Paltostoma argyrocineta.
Family Simuliidae—The Black Flies

Small, usually dark colored flies, rarely over 5 mm. in length, with short, thick legs.

Head rather hemispherical; face short, eyes round or reniform, holoptic in the males; ocelli absent. Proboscis rather short, with small, horny labelae, palpi ineurved, four segmented, the basal segment short, the two following of equal length, the fourth longer and more slender than the preceding. Thorax arched, without transverse suture; scutellum small. Abdomen rather cylindrical, tapering in the males, composed of seven or eight segments; genitalia concealed. Legs short and strong, the femora broad and flat; tibiae usually with terminal spurs; basal segment of the tarsi elongate, the apical segment small. Wings large and broad, with distinct allulae, the anterior veins thickened, the others weak. Auxiliary vein ending in the costa near the middle of the wing, the second vein absent, the first and third approximate; anterior cross-vein very short; fourth vein curved, forked nearly opposite the anterior cross-vein, the branches terminating near the apex of the wing.

The Black-Flies, Buffalo Gnats, Turkey Gnats, to use some of the common names for these pests, need no introduction to the hunter or fisherman. To most people they are extremely annoying and as they frequently occur in enormous numbers in the neighborhood of streams fishermen are only too well acquainted with them. As a rule their bites do not attract immediate attention but after a short time they cause painful swellings and, if in sufficient numbers, may result in the serious illness of the sufferer and even death. The adults attack all warm blooded animals and are known from all parts of the world, being particularly abundant in the north temperate and subarctic zones.
In addition to the irritation caused by their bites some members of the family carry disease. In Africa *Onchocerciasis*, a disease caused by a worm (*Onchocerca volvulus* Leuckart) of the family Filariiidae is transmitted by *Eusimulium damnosum* Theobald. In man the disease takes the form of small to rather large, subcutaneous swellings and may or may not be apparent without careful examination. From 40 to 50 per cent of the natives of Sierra Leone were said by Blacklock to be infected in 1926.*


(a) pupa of *Simulium venustum* in pupal cocoon and (b) pupa of *S. bracteatum*, with cocoon removed. (After Metcalf and Sanderson).
In Central America three species of *Simulium* have been shown to carry a disease displaying various symptoms and sometimes resulting in blindness. The causative agent is related to the form described above and was named *Onchoerca cicutirus* by Brumpt. In some cases of infection there are no clinical symptoms but in others there are erysipelas-like swellings, the name *coastal erysipelas* being applied to the disease in such cases. Nodular swellings may occur on the head, shoulder blades, ribs iliac crests, etc. In the eye the microfilariae may cause *conjunctivitis, keratitis* and *iritis*, blindness sometimes resulting.

Both the fly and man are necessary for the development of the disease. After being ingested by the fly the microfilariae pass from the intestine to the muscles of the thorax where further development takes place. The infective stages occur in the proboscs of the fly and are transferred to man during feeding by the insect. Strong has discussed *Onchoerciasis* in Guatemala.*

The larvae live in streams where they attach themselves to stones, plants, etc. and collect their food from the flowing water. Pupation takes place within the larval cocoon, the adults emerging under water and, quickly reaching the surface, fly away. Under favorable conditions many thousands of larvae may be found together, being so numerous as to entirely conceal the surface to which they are attached.

The latest revision of the North American species is by Dyar and Shannon.† Unfortunately these authors apparently took greater pains to find fault with the work of others than to clarify their own conclusions and only a study of their material and amplification of the descriptions will result in a clear understanding of the specific limits. In some cases the drawings were evidently made from freshly prepared slides and these show characters which gradually disappear, with the result that the same characters cannot be found in old slides and may not even be present in freshly prepared ones made from old specimens. Just what effect this will have on the validity of several of the forms recognized by the authors it is impossible to say. Malloch‡ has also revised the family: the two contributions should be used together.

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KEY TO GENERA

1. Third vein forked ................................................. 3
   Third vein simple .............................................. 2

2. Petiole of the second and third veins setulose above...Eusimulium Roubaud
   Petiole of the second and third veins bare (1).........Simulium Latreille

3. Fifth vein not forked (3).................................Parasimulium Malloch
   Fifth vein forked (2)..............................Prosimulium Roubaud

Simuliidae.—1, Simulium; 2, Prosimulium;
3, Parasimulium
Family Thaumaleidæ

Thaumalea species.

Small, bare, obscurely reddish yellow or brownish flies of peculiar appearance.

Head small, round; eyes holoptic in both sexes; ocelli absent; proboscis short; palpi longer than the antennæ, composed of five segments, the first short, the second thickest; antennæ situated near the oral margin, composed of a scape, pedicel and flagellum, the latter very compact and arista-like, but composed of ten distinct segments, the basal two rather large and globose. Thorax robust, strongly convex, without transverse suture, somewhat depressed before the rather large, obtusely triangular scutellum; metanotum arched. Abdomen narrower than the thorax, cylindrical, composed of seven segments; male genitalia large, the basal piece swollen, bladder-like; ovipositor with broad, rounded lamellæ. Legs simple, comparatively short; coxae short; tibiae without spurs; tarsi of moderate length, the anterior pair about as long as the tibiae, the penultimate segment short; empodia vestigial; claws small. Wings longer than the abdomen; auxiliary vein short, terminating in the costa; second longitudinal vein curved; the third and fourth veins simple; basal cell short; anal angle rounded.

There are about three dozen described species belonging to this family, most of them occurring in the Old World. The adults are found along the edges of streams, particularly those with mossy banks, and are not common in collections. They are small flies, under 6 mm. in length, and the wings bend sharply near the base in death, folding downward as in the Psychodidæ.

The larvæ, which resemble those of the Chironomidæ, are found in small brooks and streams where the clear water flows very thinly over the rocks, so that the back of the larva is always exposed above the surface. They feed on detritus and diatomes, and move about in search
of food. The pupae are found in the bottom of the stream between stones, etc.

The following key will separate the described genera, two of which occur in America. The family has been revised by Edwards.*

KEY TO GENERA

1. Subcostal vein ending in the costa or first vein........................................ 2
   Subcostal vein obsolete apically, ending free. (North America, pluvialis
   Dyar & Shannon) ........................................... Trichothaumalea Edwards

2. Subcostal vein ending in the first vein, very short (Australia, N. Zealand, S. America)......................... Austrothaumalea Tonnoir
   Subcostal vein ending in the costa.............................................. 3

3. Basal segment of ♂ palpi greatly swollen, the second and third segments
   not much longer than broad; subcosta weak apically (Europe).
   Androprosopa Mik
   Palpi rather stout, alike in both sexes, somewhat longer than the antenae (N. America, Europe)......................... Thaumalea Ruthé

North American Species of Thaumalea

1. Thorax and abdomen brown or blackish............................................. 2
   Thorax reddish yellow, the abdomen brown................................elnora Dyar & Shannon

2. Male clasper with two terminal claws.................. americana Bezzi
   Male clasper with about six terminal claws................... johannis Dyar & Shannon

Family Chironomidae—The Midges

Small, slender flies, rarely over 10 mm. in length, thorax large, the legs slender, antennae of males plumose.

Head small, more or less spherical, partly concealed from dorsal view by the projecting thorax. Antennae slender, with five to fourteen segments, the basal segment enlarged and globular, plumose in the males, more or less hairy in the females. Eyes reniform or oval, the ocelli absent or rudimentary. Proboscis short, not adapted for piercing; palpi with three or four segments. Thorax sub-ovate, or moderately long, more or less projecting in front, without a transverse suture but with a wide, longitudinal impression in front of the scutellum; metanotum with a more or less distinct longitudinal groove in the middle; scutellum small and hemispherical. Legs slender and rather long, especially the front pair; the tarsi often very long; empodium and pulvilli present or absent. Wings bare or haired, long and narrow, usually with a strong anal angle; anterior veins strong; auxiliary vein complete though slender; second longitudinal vein weak or absent, the third vein often forked and connected with the first by a crossvein; fourth vein often with two branches which may or may not be petiolate basally, the fifth vein usually furcate; second basal cell open or closed apically; costa usually ending at the termination of the third vein, usually well before the tip of the wing. Abdomen narrow and long, especially in the males, shorter and more robust in the females, the hypopygium exposed; ovipositor short.

The Certatopogonidae, formerly included in this family by most authors, have been recognized as a distinct family by Malloch and Edwards, and are so treated here. They may be distinguished by the shape of the thorax and absence of the metanotal depression.

The midges bear little resemblance to mosquitoes when viewed by a careful observer, but to the layman they show no differences and are not differentiated. Many people believe that they are "young" mosquitoes and that they will "grow up", but there is, of course, no justification for such a belief. In mosquitoes the costa extends entirely around the wing and the wing veins and costa are usually sealed.

The family is a very large one and comprises close to two thousand described species. Midges are found almost everywhere, but since the larvae are aquatic their distribution is limited to the vicinity of water, although they are frequently found in large numbers at a considerable distance from any visible water supply. While they are not strong
fliers they can remain in the air for long periods of time and they often occur in large numbers. Williston states that in the Rocky Mountains he has observed them dancing in the air in incredible numbers and producing a noise like a distant waterfall. As a rule they swarm in the evening, but swarms are not uncommon in sheltered places during the day. For the most part only the males swarm, although an occasional female may be found with them. While, as a rule, only one species will be found in a swarm it is not unusual to find other species among them. The females are found mostly on foliage, where they rest on the under surface during the day. Some forms occur commonly on tree trunks, logs, and in grass. They are attracted to light, frequently in very large numbers.

Since many of the Chironomids are very small they must be handled with care. The larger ones may be pinned in the usual manner, provided fine pins are used; the smaller should be attached to the side of a pin by a ring of shellac, care being taken to leave one wing and the tarsi free. Specimens without front tarsi are almost useless and, since the insects dry quickly, they must be mounted within an hour or two.

The larvae are elongate, cylindrical, slender and curved more or less downward, particularly when preserved. The head and legs are conspicuous and there may be one or more pairs of leg-like pads posteriorly. They are scavengers and live in water everywhere, also in mud and have been dredged from a depth of nearly a thousand feet in Lake Superior. Some are also found in decaying vegetation, in moss, etc. Many of them are free-living while others make mud cases on stones, leaves and pieces of wood and I have found one undetermined species building almost colorless cases in Spirogyra. Many of the larvae contain haemoglobin and are red in color, the name "blood-worms" being applied to these.

The classification of the family is not entirely satisfactory and characters for the limitation of genera are few. Edwards* has utilized the tibial spurs and combs for the separation of genera, in addition to other characters. However, the classification must be considered as very artificial, although losing nothing on that account. Since the object of taxonomy is the identification of species the means of obtaining the end is not important. Many papers dealing with the American species have been published since the appearance of Johannsen's monographic revision† in 1905, by Kieffer, Malloch,‡ Johannsen, etc. Some of the more important are listed below.

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† 1905. New York State Museum Bulletin No. 86.
FAMILY CHIRONOMIDÆ—THE MIDGES

KEY TO GENERA* 

1. Wings functional ................................................................. 2
   Wings greatly reduced, strap-like, not more than half as long as the abdomen (16) ......................................................... Eremoptera Kellogg

2. Second basal cell open apically .............................................. 2
   Second basal cell closed ..................................................... 3

3. Second vein either present and forked near tip or else indistinct or absent (Tanypodinae) ........................................... 4
   Second vein not forked apically, simple, and always distinct (Diamesinae) ............................................................... 10

4. Costa not produced beyond end of third vein, wing hairy; fourth tarsal segment linear (Abiabesmyia Johanssen) (11) .... Pentaneura Philippi
   Costa distinctly produced beyond the end of the third vein ........ 5

5. Second vein wanting, the space between first and third veins broad; wings hairy ......................................................... 6
   Second vein present ......................................................... 7

6. Fifth vein with long petiole (7) . . . . . . . . . . . . . . . . . . . . . . . . . . Trichotanypus Kieffer
   Fifth vein without petiole (Linacerus, Paratanypus) (15) ........ Podonomus Philippi

7. Fourth tarsal segment cordiform; wings bare, branches of fifth vein either with or without petiole (Celotanypus) ............ Clinotanypus Kieffer
   Fourth tarsal segment not cordiform; wings hairy or bare .......... 8

8. Fifth vein not petiolate (6) ................................................. Anatopynia Johanssen
   Fifth vein petiolate ............................................................ 9

9. Petiole of fifth vein not one-third as long as the posterior branch; wings hairy ......................................................... Tanypus Meigen
   Petiole of fifth vein at least half as long as posterior branch of this vein; wings bare or hairy (12) ..................................... Procladius Skuse

10. Posterior crossvein intersecting the petiole of the fifth vein; eyes bare; fourth tarsal segment cylindrical (11) ......... Prodiamesa Kieffer
    Posterior crossvein intersecting the anterior branch of the fifth vein near its base ..................................................... 11

11. Fourth segment of tarsus more or less cordiform, shorter or at least not longer than the fifth ........................................... 12
    Fourth tarsal segment cylindrical, longer than the fifth ......... Syndiamesa Kieffer

12. Eyes finely pubescent; antennæ of male plumose (3) ....... Diamesa Meigen
    Eyes bare .............................................................................. 13

13. Legs annulate; male antennæ not plumose (8) .......... Heptagyia Philippi
    Legs not annulate .................................................................. 14

14. Terminal segment (style) of hypopygium of male directed rigidly backwards; basal segment of anterior tarsi longer than the tibia, the anterior tibia without distinct spur except in Pseudochironomus (Chironominae) ...................................................... 25
    Terminal segment of hypopygium folded inwards; first segment of anterior tarsus shorter than the tibia; anterior tibia with spur (Orthocladiinae) .......................................................... 15

* Checked by Dr. O. A. Johanssen.
15. Third vein fused with the costa and not reaching beyond the apical
three-fourths of the wing; a false vein running close to anterior
margin of wing (9)...............................Corynoneura Winnertz
Third vein free, no false vein..........................16
16. Wings with hairs....................................17
Wings bare...........................................20
17. The thick crossvein joining the third and fourth vein very long and
appearing as the base of the third vein..................18
The crossvein short..................................19
18. Mesonotum conically produced in front; wings spotted. Eurycnemus Wulp
Mesonotum not produced; wing unicolored..............Brillia Kieffer
19. Pulvilli absent; wing hairs decumbent (13)...........Metriocnemus Wulp
Pulvilli present though small; wing hairs suberect (Spaniotoma Edwards (10)...Orthocladius Wulp
20. Mesonotum with a longitudinal fissure; wings black with white markings
in most species ....................................Chasmatonotus Leow
Mesonotum without longitudinal fissure..................21
21. Claws cleft; large marine species (Telmatogeton Coquillett, not Schiner)........Pseudochironomus Malloch
Claws not cleft.....................................22
22. Palpi porrect, 3 segmented (Symbiocladius).........Trissocladius Kieffer
Palpi flexible, 4 segmented..................................23
23. Fourth segment of at least the hind tarsi cordiform, shorter than the
fifth (Thalassomyia Johannsen, not Schiner)..........Cardiocladius Kieffer
Fourth tarsal segment linear................................4
24. Dorsocentral hairs minute and decumbent; tibiae usually banded with
white; genitalia in most cases in part pure white (1)...Cricotopus Wulp
Dorsocentral hairs larger and suberect; tibiae not banded (Spaniotoma Philippi) Edwards, Psectrocladius, Trichocladius, Dactylocladius, Camp-
tocladius) (10)........................................Orthocladius Wulp
25. Wing disc with hairs at least at tip..........................26
Wings quite bare, the anterior crossvein distinct and oblique...........27
26. Squamae fringed; anterior crossvein distinct and oblique (1).
Pentapedilum Kieffer
Squamae quite bare, anterior crossvein longitudinal in position or indistinct (2).............................Tanytarsus Wulp
27. Eyes widely separated, reniform; all tibiae with long conspicuous spurs;
pronotal collar large; basal segment of anterior tarsus not longer
than the tibia.........................................Pseudochironomus Malloch
Eyes with dorsal projection; front tibial spur indistinct or absent;
basal segment of anterior tarsus longer than the tibia (5).
Chironomus Meigen

The genus Chirocladius Picado, represented by a species from Costa Rica, and which seems to belong among the Chironominae, is too briefly
described to place in the key.

*Pseudochironomus Malloch, with widely separated reniform eyes and very large pronotal
collar, in spite of short basal segment of the anterior tarsi and the tibial spurs, belongs with the
next section.
Family Ceratopogonidae—The Biting Midge

Culicoides species.

Very small, slender flies, rarely 5 mm. in length.

Head small, spheroidal and rounded behind or hemispherical and flattened behind; ocelli absent or practically so; antennæ slender, usually with fourteen segments and a fifteenth microscopic one, the apical three to five segments lengthened, the basal swollen; mouth parts complete, adapted for biting. Thorax rather oval, shorter than in the Chironomidae; pronotum never prominent; metanotum rather rounded, never with a longitudinal groove; scutellum small, hemispherical, usually bearing distinct bristles. Wings of moderate width, folded flat over the back when at rest; second vein absent, fourth vein generally furcate; alula very narrow; squamae never completely fringed. Legs moderately long, the posterior pair longest; femora and tibiae sometimes swollen, the former sometimes with spines beneath; pulvilli present or absent. Abdomen elongate; genitalia exposed; ovipositor small.

The Ceratopogonidae may be readily distinguished from the Chironomidae by the characters enumerated above. They are minute or quite small flies and are often serious pests, especially along the seashore, in the tropics and along our rivers and lakes, but are not limited in distribution to large bodies of water. The adults are either predaceous or externally parasitic although no real differentiation can be made. The larger species are known to prey upon small insects while the small
forms suck blood and they have been observed more than once attached to "mantids" or "walking sticks", upon which they feed. Warm blooded animals are freely attacked by representatives of the genera *Culicoides*, *Lasiohelea* and *Leptoconops* and the tiny creatures sometimes make man miserable by their unceasing attention. They are known commonly as "punkies" and "no-see-ums", the latter name because of their small size, and they are unwitting jokers since almost any large insect is liable to be blamed for the bites of these lilliputians. They are attracted to light in large numbers and are difficult to keep from houses owing to their small size.

In Africa *Culicoides austeni* is known to be the intermediate host of a parasitic worm (*Acanthocheilonemus perstans*), a form occurring also in South America, but the worm is not known to cause any specific disease. Further study may link the members of this family with the transmittal of diseases of a specific nature.

The larvæ are aquatic or semi-aquatic being found in moist places, in mud, sand, decaying vegetation and in tree-holes. It seems likely that most of the marine species live within the tide-zone and for that reason there is no practical means of control, while those living in decaying vegetation form an equally serious problem. The species living in tree holes are seldom abundant and the elimination of their breeding places is a simple matter. It is not known whether the larvæ are scavengers or predators and it may be that they include both groups.

The insects are difficult to capture and require special care in handling. Those which bite may be captured by placing a bottle over them as they suck blood, but the collector will no doubt find it necessary to exercise great self control during the process owing to the numbers which begin feeding at the same time. Specimens seem best when mounted on the side of a pin but some may be kept in alcohol and mounted on slides. Owing to the delicate nature of the hairs on the wings they are easily abraded and the characteristic wing pattern disappears. For this reason dried specimens should always be preserved. Edwards* has dealt with the British species and his paper will be found invaluable. Malloch†, Johannsen‡, Root, Hoffman and others have published on the North American forms and a great deal of research is being conducted at the present time by the last two mentioned authors. I am indebted to Drs. Johannsen and Root for checking and revising the key to this family.

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‡ 1905, N. Y. State Mus. Bull. 2196.
KEY TO GENERA

1. Empodium as long as claws............................................. 2
   Empodium very short or absent................................... 3

2. Costa extending to about middle of wing; wings with dense macrotrichia
   all over (*Euforciopomyia* Malloch) (3)......................... *Forcipomyia* Meigen
   Costa extending well beyond middle of wing; macrotrichia sparser,
   sometimes absent (1) ........................................ *Atrichopogon* Kieffer

3. A fold looking like a simple vein between third and fourth veins; first
   and third veins indistinct, more or less fused. (*Tersesthes* Townsend).
   
   Leptoconops Skuse
   No vein-like fold between third and fourth veins.................. 4

4. Costa extending to about middle of wing; second radial cell short and
   square-ended, first radial cell obliterated; macrotrichia usually dense
   (*Pseudoculicoides* Malloch, *Isoecacta* Garrett) (5)........... *Dasyhelea* Kieffer
   Costa extending well beyond middle of wing; radial cells usually other-
   wise ........................................................................ 5

5. Humeral pits present and conspicuous; microtrichia of wings distinct;
   claws of female small and equal; at least some macrotrichia present.
   (*Aecacta* Poey) (9, 10)........................................... *Culicoides* Latreille
   Either humeral pits absent or else microtrichia absent or else claws of
   female very unequal.................................................. 6

6. The two radial cells small and equal or one or both of them obliterated;
   wings finely punctuate but without distinct microtrichia; legs not
   thickened .................................................................... 7
   Either second radial cell much longer than broad or else wings with
   distinct microtrichia or else legs modified.......................... 8

7. Wings with at least one dark spot and with some macrotrichia; female
   claws unequal (*Neoceratopogon* Malloch)......................... *Alluaudomyia* Kieffer
   Wings whitish, without dark markings, and without macrotrichia;
   female claws equal (8).................................................. *Ceratopogon* Meigen

8. Hind femora noticeably thicker than the others.................... 9
   Hind femora not thickened.......................................... 10

9. Hind femora much thickened and spinose beneath; hind tibiae not
   thickened (*Ceratolophus* Kieffer) (1)........................... *Serromyia* Meigen
   Hind femora not spinose; both hind femora and hind tibiae moderately
   thickened (7) ......................................................... *Monohelea* Kieffer

10. First and third veins connected by a crossvein, 2 radial cells.......... 11
    First and third veins not connected, one long radial cell........ 15

11. Front femora spinose beneath........................................ 12
    Front femora not spinose beneath................................ 13

12. Front femora conspicuously swollen................................ *Heteromyia* Say
    Front femora not conspicuously swollen............................ *Palpomyia* Meigen

13. The branches of the fourth vein petiolate basally (*Hartomyia* Malloch).
    *Stilobezzia* Kieffer
    The branches of the fourth vein arise at or before the cross vein..... 14

14. Last segment of front tarsi much swollen (2)....................... *Clinohelea* Kieffer
    Last segment of front tarsi not swollen (6).................... *Johannsenomyia* Malloch

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15. Branches of fourth vein petiolar basally...................... 16
   Branches of fourth vein arise at or before the crossvein............... 17
16. At least one pair of femora with spines beneath............ Pseudobezzia Malloch
   Femora without spines beneath................................ Parabezzia Malloch
17. Posterior branch of the fourth vein elbowed basally in the female (12).
   Stenoxenus Coquillett
   Posterior branch of fourth vein not elbowed..................... 18
18. At least one pair of femora with spines beneath (11)........ Bezzia Kieffer
   Femora without spines beneath.................................. Probezzia Kieffer

Family Psychodidæ—The Moth Flies

Thickly haired, small flies, rarely exceeding 5 mm. in length, the wings clothed with hairs or scales and folded roof-like over the back.

Head small; ocelli absent. Antennaæ usually as long as the head and thorax together, the segments usually bead-like and sometimes so densely haired as to appear very thick; composed of from twelve to sixteen segments, the basal segments usually short and cylindrical. Proboscis usually short but more or less elongate and rigid in Flebotomus; palpi composed of four segments, hairy. Thorax without transverse suture, not very convex; scutellum rounded. Abdomen rather cylindrical, composed of six to eight segments; male genitalia prominent, the female ovipositor usually projecting. Wings large, ovate, often pointed, when at rest lying roof-like over the abdomen, the base being bent at more than a right angle, the veins and border densely haired, the integument often with hairs or scales; veins strong, usually concealed by the dense hair; crossveins restricted to the basal third of the wing; two or three of the veins furcate. Legs rather short, elongate in Flebotomus and usually thickly haired.

The adults occur commonly in shady places in the vicinity of water and may often be found in large numbers on dense foliage in swamps, where they crawl about on the under surface of leaves, occasionally alighting on the upper surface after a short flight. I have seen them in thousands on tree-trunks after a heavy rain and they are not rare on logs and fallen trees where they walk about in a peculiar, jerky manner or remain perfectly still. One or more species of Psychoda breeds in drain pipes and they often cause uneasiness by appearing in the bath room. Their presence should incite interest rather than fear as the larvae survive hot water and soap alike, and do no harm. The adults are not common in collections, chiefly because they are so easily damaged. The hairs brush off and they become useless unless unusual care is taken of the specimens. No recent revision of the family has appeared and the synonymy is badly mixed and is not to be trusted. The male genitalia offer excellent characters. There are dozens of species and the family offers an excellent opportunity for a thorough, monographic work.

In America two diseases are known to be carried by species of Flebotomus. The disease known as Verruga Peruviana, Oroya Fever or Carrion’s Disease has been found only in narrow valleys on the western slopes of the Peruvian Andes. Verruga is said not to be serious but Oroya Fever (Carrion’s Disease), the malignant form, is responsible for many deaths annually. Local Leishmaniasis or Espundia
occurs in South and Central America. The causative organism is *Leishmania braziliensis* but it is not known definitely which species of *Flebotomus* carry the disease. It is possible that most of them are capable of doing so. The statement has been made that the adults of *Flebotomus* are nocturnal and that protection against disease may be obtained by remaining indoors at night. Most of the nocturnal blood-sucking flies may be found on the wing on dull cloudy days.

The larvae live in decaying vegetable matter, dung, or water and are peculiar in possessing both open spiracles and tracheal gills; the head bears eye-spots; in the aquatic forms there are sucking discs on the segments behind the head, but no feet.

**KEY TO GENERA**

1. Two longitudinal veins behind the posterior forked vein.............. 2
   Three longitudinal veins behind the posterior forked vein........... 3

2. Two forked veins in front of the middle of the wing.*Flebotomus* Rondani
   One forked vein in front of the middle of the wing (3)...... *Maruina* Müller

3. Wings with scales or scale-like hairs on the veins or membrane...... 4
   Wings with hairs only ........................................ 5

4. Wing membrane with broad scales over most of the surface.
   *Parabrunettia* Brunetti
   Wings with scales on the veins only.................. *Brunettia* Amandale

5. Two longitudinal, unforked veins between the anterior and posterior
   furcate veins .................................................. 6
   Only one longitudinal vein between the anterior and posterior furcate
   veins (4) .................................................. *Trichomyia* Haliday

6. The second simple vein behind the anterior furcate vein ends in the
   tip of the wing (1)................................. *Psychoda* Latreille
   The second simple vein ends behind the tip of the wing (2).
   *Pericoma* Walker

*Phlebotomus* of authors.
Family Dixidæ

Dixa species.

Rather small, slender, nearly bare species occurring near running water.

Proboscis somewhat projecting; palpi four-segmented; antennæ long, the basal segments swollen, the flagellar segments hair-like and poorly separated; ocelli absent; eyes round. Thorax strongly convex, without transverse suture; metanotum arched; scutellum transverse. Abdomen long and slender, composed of seven or eight segments, thickened posteriorly in the male, pointed in the female. Legs long and slender, the coxae somewhat elongated; tibiae without terminal spurs. Wings rather large; auxiliary vein present, ending in costa before the middle of the wing; two complete basal cells.

This family may be readily recognized by the wing venation. The adults often dance in swarms at a height of a few inches to a few feet above the surface of small streams in swampy or wooded areas and occur also along the edges of ponds.

The larvae are aquatic and resemble those of mosquitoes but the thorax is not broadened. They are cylindrical, somewhat flattened beneath, and n-shaped.

There are but two known genera, Neodixa occurring only in New Zealand, and Dixa, which is cosmopolitan. I present a key, adapted from Edwards, to the genera and subgenera of the world.
KEY TO GENERA

1. Second vein branched ........................................... Dixa Meigen
   Second vein simple (New Zealand) ............................... Neodixa Tonnoir

Subgenera of Dixa

1. Hind margin of the wing evenly rounded .......................... 2
   Hind margin of wing produced at end of fifth vein; all veins in apical
   part of wing parallel ........................................ Dixapuella Dyar & Shannon

2. Crossvein connecting the fourth vein and anterior branch of the fifth
   vein strong ...................................................... 3
   Crossvein connecting anterior branch of the fifth vein and the fourth
   vein faint ........................................................ Dixella Dyar & Shannon

3. First flagellar segment fusiform or oval ............................ 4
   First flagellar segment cylindrical, five times as long as wide.
   Paradixa Tonnoir

4. First flagellar segment oval, about two and one-half times as long as
   wide ............................................................... Nothodixa Edwards
   First flagellar segment fusiform; at least three times as long as wide.
   Dixa Meigen
LIFE STAGES OF MOSQUITOES

Culex  Amopheles  Aedes  Algypti

EGGS

LARVAE

PUPAE

ADULTS

The life stages of three different genera of mosquitoes showing characteristic types of each and resting position of the adults (After Pieper and Beauchamp, from Metcalf and Sanderson).
Family Culicidæ—The Mosquitoes

Aëdes larvæ. Note position at surface of water characteristic of the Culicini. (After Matheson, courtesy C. C. Thomas).

Slender, delicate flies, with slender legs and usually with scales upon the body and appendages.

Head small, subspherical; eyes reniform; ocelli absent. Antennae slender, elongate, composed of fourteen or fifteen segments, densely plumose in the males; first segment reduced to a narrow ring, second globose, the following elongated, nearly or quite cylindrical and with whorls of hairs, in the male the apical two segments elongated and nearly bare. Thorax ovate, arched but not projecting over the head, without transverse suture; scutellum short, evenly rounded or trilobate; metanotum usually arched. Abdomen long and narrow, somewhat arched, composed of nine or ten segments; male genitalia prominent but not large; ovipositor short. Legs long and slender, the coxae not elongate; tarsi long, the claws often denticulate. Wings long and narrow, at rest lying flat over the abdomen, with six fully developed longitudinal veins reaching the margin, the posterior margin fringed with hairs or scales, the costal vein extending around the wing; venation as in figure; two basal cells, the veins usually clothed with scales.
Anopheles larva. Compare position at surface of water with that of Aëdes. (After Matheson, courtesy C. C. Thomas).

Head and mouth-parts of a mosquito. (After Metcalf and Sanderson).
The mosquitoes are too well known to require hints as to where they may be found although it may be well to remark that a "swatted" mosquito does not make a suitable study specimen. Despite the fact that these flies are not altogether fragile it is nevertheless true that most specimens in collections are in poor condition because the preservation of the insects in good state depends upon care in handling immediately after capture. Few specimens should be placed in a killing bottle and they should be mounted while fresh. All but the very small species should be pinned on fine steel pins and not mounted on points; the small ones should be fastened on the sides of pins, using a ring of white shellac. With careful collecting, care in pinning and proper preservation, a collection of these insects may be very attractive. Many of the adults are extremely beautiful although it must be admitted that most of those in the Nearctic region do not go in for fine colors; in the tropics many of the species are clothed in nature's most beautiful colors.

All mosquitoes are not injurious and many of them do not bite. Some are predaceous upon other mosquitoes in the larval stage and this is true of the Chaoborinae, which should, perhaps, be ranked as a distinct family, since they almost entirely lack scales. Their larvae are called "Phantoms" because they are practically colorless.

So much has been written about mosquitoes during the present century that it would be impossible to review the entire literature in the space available but mention may be made of two books which will furnish a basis for intensive study for anyone interested. Matheson's "Handbook of the Mosquitoes of North America" deals with most of the species occurring in the United States and Canada and gives a thorough résumé of the medical and control aspects of the subject. Dyar's "The Mosquitoes of the Americas" deals entirely with the taxonomy of the group, but the descriptions are too brief and often omit important details; nevertheless it is an indispensable work and with careful study and use of the figures will be found fairly satisfactory.

I may say that the Culicidae are one of the most important families of the Diptera insofar as human welfare is concerned. The diseases carried by them are not only lethal but cause extreme suffering and agony. Without doubt a much more extensive account of these insects might well be included in this work but space does not permit.

The diseases known to be transmitted by mosquitoes are Malaria, Blackwater Fever, Yellow Fever, Dengue, Filariasis, Bird Malaria and Fowl-pox. Of these Malaria and Yellow Fever are the most widely distributed and much has been written about them. In at least the first five both the mosquito and man are essential in the life cycle of the
Culicidæ I.—Lateral view of thorax of: 1, Uranotaenia lœwii; 2, Theobaldia morsitans; 3, Anopheles punctipennis; 4, Psorophora ciliata; 5, Megarhinus septentrionalis. (After Matheson, courtesy C. C. Thomas).

l.m.e., lower mesepimeral bristles; pa., prealar bristles; pe., prothoracic bristles; pn., pronotal bristles; p.sp., postspiracular bristles; ps., prosternal or propleural bristles; sp., spiracular bristles; st.p., sternopleural bristles; u.me., upper mesepimeral bristles.
Culicidae II.—Lateral view of thorax of: 6, Orthopodomyia signifer; 7, Deinocerites pseudes; 8, Wyeomyia smithii; 9, Culex pipiens; 10, Mansonia perturbans; 11, Aedes vexans.
(After Matheson, courtesy C. C. Thomas).
causative organism, although other warm blooded animals may take the place of man. If the mosquitoes essential for the development of the organisms causing the disease were destroyed the disease would disappear entirely and it is because of this that such vigorous steps have been taken to stamp out mosquitoes in various parts of the world. The complete destruction of all disease carrying mosquitoes is scarcely possible but it has been demonstrated in the Panama Canal Zone that they can be kept under control to such an extent that the diseases they carry are no longer a serious menace to residents of the region. It is now so well known that the construction of the Panama Canal was made possible only by the control of mosquitoes that no more than mention of the fact need be made here.

Malaria is still a common disease in many parts of the United States. Many of us think of it as a tropical or subtropical disease, but nothing could be further from the truth. Malaria has raged at one time or another over rather large areas of the northern states and may do so again if patients suffering from the disease in its active stage should be bitten by our native Anopheles mosquitoes and they have the opportunity of developing and injecting the protozoan causing the fever into the blood stream of uninfected persons.

The North American Anopheles known to transmit the disease are quadrirmaculatus, maculipennis, punctipennis, crucians, and atropus in the United States, albimanus, pseudopunctipennis and quadrirmaculatus in Mexico, and albimanus and tarsimaculatus in Central America and the West Indies. The last three species named for the United States are not considered important vectors of the disease.

The causative organisms of Malaria are Plasmodium vivax for tertian, P. malaria for quartan, and P. falciparum for the pernicious type. Tertian is our commonest type, being approximately three times as prevalent as the other two combined, while the pernicious form is almost twice as prevalent as the quartan.

An idea of the essential part played by insects which act as intermediary hosts for parasites causing human diseases, may be obtained from a brief outline of the life cycle of Plasmodium vivax. The organism passes an asexual stage in man, developing and multiplying in the red corpuscles, causing them to enlarge. In a little less than two days the trophozoites are mature, having absorbed the contents of the cell and the term schizont is now applied to them. These divide into from 15 to 24 merozoites and are discharged into the blood stream by rupturing of the cell wall. The cycle now begins over again and the same process is repeated, but after a time certain of the merozoites develop into male (microgametocytes) and female (macrogametocytes) which
remain in the red blood cells, no further development taking place. From this point on the mosquito becomes an essential factor since, unless they are ingested by a mosquito, the gametocytes are capable of no further development.

When the gametocytes are taken into the mosquito further development occurs, commencing in the stomach of the host. The female (macrogametocytes) mature into what is called a macrogamete, corresponding to a ripened but unfertilized ovule, while the microgametocytes give off a number of thin, elongate, worm-like bodies, the male elements or microgametes. These travel about by a lashing motion until they come in contact with a macrogamete, when they penetrate the cell wall and fertilization takes place, producing a zygote, a round body which soon elongates into an ookinete which becomes active, penetrates the wall of the stomach and establishes itself between the epithelial and muscular layers. In this position it absorbs food from the surrounding tissue, becomes spherical and very large, and in this stage is termed an oocyst. In this stage the spores (corresponding to eggs) are developed, and are called sporozoites. They escape by the breaking of the oocyst and enter the body cavity, where they are carried to all parts of the body by the free-flowing blood, many of them finding their way to the salivary glands and into the blood streams of human beings where they penetrate the red blood cells and develop into schizonts.

It will be seen from this that the sexual stage occurs in the mosquito, occupying from eight to fourteen days, and probably results in no ill effects to its host, since it is a cold-blooded creature.

In tertian malaria a chill is produced about every three days, followed by fever, while in quartan malaria the chill occurs every four days, due to the longer incubation period of the merozoites, while in pernicious malaria the chills and fever are irregular.

Blackwater Fever is now believed to be the result of numerous attacks of malaria or a more or less continuous infection and derives its name from the fact that the patient’s urine is of a dark mahogany color due to the presence of broken down red corpuscles.

Yellow Fever may be carried by at least three species of mosquitoes in America Aedes (Stegomyia) aegypti, Aedes fluvialtilis and Aedes scapularis. Possibly other species might carry the disease as well but we fortunately do not have it in the United States, even though A. aegypti is common in the south. With present facilities for rapid transportation there is danger of travellers from yellow fever areas entering the country and developing the disease after arrival. If we were sure that the disease would be quickly diagnosed and the patient isolated in a mosquito-proof room we might feel much more certain
Culicidæ III.—1, Megarhinus; 2, Megarhinus, $\delta$ head; 3, Aëdes, wing venation; 4, Haemagogus; 5, Haemagogus, front claws of $\delta$; 6, Wyeomyia, ?; 7, Chaoborus, posterior tarsus.

Venation of Aëdes.

Venation of Anopheles, giving Comstock-Needham terminology and that of Schiner, etc. (in brackets). Veins.—C, costal; Sc, subcostal (auxiliary); R, (first longitudinal); R$^2$, R$^3$, (second longitudinal); R$^4$, (third longitudinal); M$^1$, M$^2$, (fourth longitudinal); Cu$^1$, Cu$^2$, (fifth longitudinal); 2 da., (sixth longitudinal); r-m, radio-medial crossvein (anterior crossvein); m-cu, medio-cubital crossvein (posterior crossvein). Cells.—a, Sc, (subcostal); b, R, (first marginal); c, R$^1$, (second marginal); d, R$^2$, (submarginal); e, R, (first posterior); f, M$^1$, (second posterior); g, M$^2$, (third posterior); h, Cu, (fourth posterior); i, Cu (anal); j, 2a, (auxiliary). (After Matheson, courtesy C. C. Thomas).
that the disease would not become established in this country, but, unfortunately, few doctors are familiar with the symptoms of yellow fever and there is grave danger of the disease remaining undiagnosed until it is too late to take precautionary measures. Even though steps have been taken to quarantine all persons coming from known yellow fever areas the danger of introduction of the disease is an ever present menace.

Dengue or Break-bone Fever is another disease carried by the Yellow Fever mosquito (Aedes aegypti). It is a common tropical and subtropical disease and there are occasional outbreaks in the Southern States, corresponding to the distribution of the mosquito. After biting a patient it requires from eight to eleven days before the mosquito is capable of transmitting the disease.

The microfilariae of Wuchereria bancrofti Cobbold are taken up (in America) by Culex fatigans Wiedemann and undergo development in the muscuses of the mosquito, in much the same way as described for Malaria but there is no increase in numbers and they do not become sexually mature until they have been returned to the human body. The worms occur in the lymphatic system and may be responsible for a number of organic disturbances. The region about Charleston, South Carolina is the only area in the United States where Filariasis is prevalent but it is common in the tropics of both hemispheres.

Since writing the foregoing and preparing the following key, Edwards' fascicle in the "Genera Insectorum" (194), has appeared. In this work the Dixidæ are included as a subfamily of the Culicidæ, a course I do not follow. An examination of this important fascicle of "Genera Insectorum" will disclose the fact that Edwards makes free use of subgenera. My views on this question are expressed elsewhere in this work. With the author's view that genera should be limited to groups readily characterized in both sexes I most heartily agree. The quality of the scientific work of this author is of too high a standard to warrant criticism except of a most favorable nature and one can disagree with him only on questions of minor importance. The question of subgenera is really one of likes and dislikes, and I prefer to keep as close as possible to a binomial system of nomenclature.

Most of the cuts used to illustrate this family are from "A Handbook of the Mosquitoes of North America" by Dr. Robert Matheson and I wish to express my indebtedness to him and to Mr. C. C. Thomas, the publisher, for furnishing them, and also my appreciation of their wholehearted cooperation.
Aëdes vexans. (After Matheson, courtesy C. C. Thomas).
**KEY TO GENERA**

1. Proboscis not elongate, extending but little beyond the clypeus; wings with scales (when present) confined mostly to the fringe. (Chao-borinae) ........................................ 2
   Proboscis elongate, extending far beyond the clypeus; wings with the veins and margins with scales (Culicinae) .......................... 5

2. Anal vein ends beyond the fork of the fifth vein. .......... 3
   Anal vein ends before the fork of fifth vein. .......... Encorethra Underwood

3. First tarsal segment longer than the second. .......... 4
   First tarsal segment shorter than the second. ....... Mochlonyx Læw

4. First vein ending much closer to the tip of the anterior branch of second vein than to that of the auxiliary vein (III-7).  
   Chaoborus Lichtenstein

5. Abdomen without scales, or at least with the sternites largely bare; scutellum with the margin convex, evenly setose; never a spurious vein behind fifth vein (I-3, and text figure of larva).  
   Anopheles Meigen
   Abdomen with both tergites and sternites completely clothed with scales; scutellum trilobed, the lobes alone setose; if scutellum evenly convex then a spurious vein behind fifth vein. .......... 6

6. Proboscis rigid, the outer half more slender and bent backwards; a spurious vein behind the fifth vein (I-5, III-1, III-2).  
   Megarhinus Desvoidy
   Proboscis more flexible, of uniform thickness (at times swollen at tip), outer half not bent back; never a spurious vein behind fifth vein. .......... 7

7. Base of hind coxae in line with or above the upper margin of the metasternal sclerite ........................................ 8
   Base of hind coxae below upper margin of metasternal sclerite .................. 16

8. Pronotal setae absent; prothoracic lobes not widely separated. .......... 9
   Pronotal setae present; prothoracic lobes widely separated. .......... 14

9. Prealar setae absent ........................................ 10
   Prealar setae present ..................................... 11

10. Propleural setae absent ................................. Sabethes Desvoidy
    Propleural setae present .................................. Sabethoides Theobald

11. Spiracular setae present .................................. 12
    Spiracular setae absent .................................. Limatus Theobald

12. Lower sternopleurals distinctly below the upper margin of metasternal sclerite ........................................ 13
    Lower sternopleurals extending to or above the upper margin of the metasternal sclerite .......................... Dendromyia Theobald

13. Outstanding scales on at least the basal portion of the second and third veins broad. .................................. Miamyia Dyar
    These scales usually narrow (II-8, III-6) .................................. Wyeomyia Theobald

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* Checked by Dr. R. Matheson.
Culex pipiens. (After Matheson, courtesy C. C. Thomas).
14. Clypeus with setae ........................................... Joblolia Blanchard
  Clypeus without setae ........................................ 15
15. Lower sternopleural setae extending above the upper margin of the
    metasternal sclerite ....................................... Goldia Theobald
    Lower sternopleural setae not extending above the upper margin of
    the metasternal sclerite (I-1) ............................ Isostomyia Coquillett
16. Anal vein ending opposite or before the fork of the fifth vein.
    Uranotenia Arribalzaga
    Anal vein ending well beyond the fork of the fifth vein .......... 17
17. Prescutellar setæ and postspiracular setæ absent (III-1, III-5).
    Hæmagogus Williston
    Prescutellar setæ present ................................... 18
18. Postspiracular setæ present ................................... 19
    Postspiracular setæ absent .................................. 21
19. Spiracular setæ absent ........................................ 20
    Spiracular setæ present (I-4 and text figure) ............. Psorophora Desvoidy
20. Wing scales narrow (rarely broad) or the base of first vein with setae
    posteriorly on the upper side (II-11, III-3, and text figs.).Aëdes Meigen
    Wing scales broad; base of first vein bare (II-10) ....... Mansonia Blanchard
21. Spiracular setæ present (I-2) ........................... Theobaldia Neveu-Lemaire
    Spiracular setæ absent ...................................... 22
22. First vein without setæ basally on upper side; wing scales broad .... 23
    First vein with setæ basally on upper side; wide scales narrow .... 25
23. Fourth segment of front tarsi at least as broad as long (II-6).
    Orthopodomyia Theobald
    Fourth segment of front tarsi longer than wide ................ 24
24. Antennal segments little longer than wide ........................ Aedemia Theobald
    Antennal segments much longer than wide (II-10) ....... Mansonia Blanchard
25. Antennæ much longer than the length of the proboscis (II-7).
    Deinocerites Theobald
    Antennæ not longer than the length of the proboscis ........ 26
26. Wings yellowish, spotted with black ........................ Lutzia Theobald
    Wings never black-spotted (II-9 and text figure) ........ Culex Linnaeus

KEY TO THE GENERA OF THE WORLD

1. Scales almost confined to the wing-fringe; mouth-parts short, the
    palpi incurved (Chaoborinae) ................................ 2
    Wing-veins and legs scaled; proboscis long; palpi not incurved
    (Culicinae) ...................................................... 7
2. Clypeus large and hairy; R, ending close to tip of Rs ............ 3
    Clypeus small and nearly bare; R, ending far from tip of Rs.
    Corethrella Coquillett
3. First tarsal segment much shorter than the second ................ 4
    First tarsal segment longer than the second .................. 6
4. Tibiae spurred ..................................................... 5
    Tibiae not spurred; metapleural hairs absent ................ Mochlonyx Læw
Psorophora ciliata.
5. Tibial spurs 1-2-2; metapleural hairs present...........Cryophila Edwards
   Tibial spurs 1-1-1; metapleural bare..................Promychlonyx Edwards

6. Clypeus as long as the head; claws larger and toothed.
   Clypeus shorter than the head; claws small and simple.
   Eucorethra Underwood
   Chaoborus Lichtenstein

7. Abdomen without scales; or at least with the sternites largely bare
   (Anophelini) .................................................. 8
   Abdomen with both tergites and sternites completely clothed with
   scales .......................................................... 10

8. Scutellum slightly trilobed ..................................Chagasia Cruz
   Scutellum evenly rounded ................................... 9

9. Stem of median fork wavy ....................................Bironella Theobald
   Stem of median fork straight ...............................Anopheles Meigen

10. Proboscis not rigid, of uniform thickness (unless swollen at tip), outer
    half not bent backwards (Culicini) ....................... 11
    Proboscis rigid, outer half slender and bent backwards (Megarhinini).
    Megarhinus Desvoidy

11. Squama fringed (fringe usually complete, rarely interrupted); vein A
    reaching well beyond base of cubital fork .................. 12
    Squama bare or rarely with 1-4 short hairs ................ 30

12. Pulvilli present; pleural chaetotaxy well developed, but spiracular and
    post-spiracular bristles absent ............................ 13
    Pulvilli absent or rudimentary ............................. 14

13. Second antennal (first flagellar) segment short in both sexes; antennæ
    of ♂ nearly always plumose ..................................Culex Linnaeus
    Second antennal (first flagellar) segment elongate in both sexes; an-
    tennæ of ♀ not plumose .......................................Deinocerites Theobald

14. Post-spiracular bristles absent; claws of ♀ simple (except in Leices-
    teria, Haemagogus, and Heizmannia) ....................... 15
    Post-spiracular bristles present, even if only one or two; claws of ♀
    usually toothed; dorsocentral and upper sternopleural bristles nearly
    always well developed ........................................ 25

15. Spiracular bristles present (sometimes only one or two) ............ 16
    Spiracular bristles absent .................................. 19

16. Several upper sternopleural bristles; stem-vein usually hairy beneath.
    Theobaldia Neveu-Lemaire
    At most one or two upper sternopleural bristles; stem-vein bare be-
    neath ...................................................... 17

17. Postnotum nearly always bare (Oriental and Australasian).
    Tripteroides Giles
    Postnotum with bristles (Neotropical) ...................... 18

18. Clypeus with setæ .........................................Trichoprosopon Theobald
    Clypeus bare ...............................................Gældia Theobald

* Posterior four tibiae each with two apical spurs.
Corethra cinctipes.
19. Dorsocentral and pre-scuteellar bristles absent; pronotal lobes approximated .................................................. 20

Dorsocentral and pre-scuteellar bristles well developed; pronotal lobes well separated .................................................. 21

20. Postnotum usually bare (Neotropical) ............... Haemagogus Williston
Postnotum usually with bristles (Oriental) .............. Heizmannia Luillow

21. Post-spiracular area scaly; ♀ claws usually toothed; ♂ palpi more than half as long as proboscis ......................... Armigeres Theobald
Subgen. Leicestera Theobald
Post-spiracular area bare; ♀ claws simple ........................................... 22

22. All segments of ♀ antenna, and last two of ♂ antenna short and thick;
middle femora with scale-tuft. .................. Aedeomyia Theobald
Antennae normal, slender; middle femora without scale-tuft ........ 23

23. First segment of front tarsi longer than the last four together; fourth very short in both sexes .................. Orthopodomyia Theobald
First segment of front tarsi not longer than last four together; fourth not shortened in ♀ ........................................... 24

24. Proboscis of ♂ much swollen apically, of ♀ slightly so, or else cell R₉ shorter than its stem. ....................... Ficalbia Theobald
Proboscis not swollen apically; cell R₉ at least as long as its stem.

Mansonia Blanchard

25. Head with numerous short hairs on vertex in addition to the orbital row; antennae thick in both sexes, not plumose in ♂ .......... Opifex Hutton
Head without hairs on vertex apart from the orbital row; antennae slender in ♀, nearly always plumose in ♂ .................. 26

26. Spiracular bristles present, even if few (American). Psorophora Desvoldy
Spiracular bristles absent ............................................................... 27

27. Eyes widely separated, space between them clothed with metallic silvery scales (Ethiopian) .................. Eretmopodites Theobald
Eyes less widely separated (sometimes touching), space between them not covered with metallic silvery scales .................. 28

28. Wing-scales generally mostly narrow (when, rarely, all are broad, the ♀ claws are toothed); usually a few hairs on upper surface of stem-vein ................. 29
Wing scales all very broad; ♀ claws simple; stem-vein bare.

Mansonia Blanchard

29. Proboscis more slender, not recurved at tip in repose; ornamentation various ................................................................. Aedes Meigen
Proboscis rather stout, recurved at tip in repose; dark species with flat scales on vertex and scutellum .......... Armigeres Theobald

30. Wing-membrane without microtrichia (or these only visible under a high magnification); cell R₉ shorter than its stem; An ends about opposite base of cubital fork .................. Uranotenaia Arribalzaga
Wing-membrane with distinct microtrichia (visible under a magnification of 50) .................................................... 31

31. Postnotum bare; An (except in some species of Topomyia) ending little if at all beyond base of cubital fork; two or more posterior pronotal bristles present (Palæotropical) ................. 32
Postnotum with bristles; An ending well beyond base of cubital fork; posterior pronotal bristles usually absent; spiracular bristles present (except in Limatus) (Neotropical).................................................. 35

32. Spiracular bristles absent; clypeus normal........................................... 33
Spiracular bristles present (one or more); clypeus rather small and narrow; cell R₂ longer than its stem........................................... 34

33. Cell R₂ shorter than its stem; several posterior pronotal bristles; wing scales normal........................................... Zeugnomyia Leicester
Cell R₂ longer than its stem; two posterior pronotal bristles; wing scales emarginate at tips........................................... Hodgesia Theobald

34. Proboscis very hairy, much enlarged at tip.............. Harpagomyia de Meijere
Proboscis not hairy, rarely enlarged at tip.............. Topomyia Leicester

35. Middle legs with “paddles” formed of very long erect scales.
Middle legs without “paddles”........................................... 36

36. Clypeus with hairs; large species with long ♀ palpi.
Clypeus bare, or with scales only........................................... Trichoprosopon Theobald

37. Hind tarsi with long suberect scales; large species with long ♀ palpi.
Hind tarsi with appressed scales only; smaller species with short ♀ palpi ........................................... Goeldia Theobald

38. No bristles on subalar knob; pronotal lobes large and almost in contact; mesonotal scales all metallic.................. Sabethoides Theobald
Bristles present on sub-alar knob; pronotal lobes more widely separated; mesonotal scales rarely metallic................................. 39

39. Spiracular area with scales only; hind tarsus with one claw.
Spiracular area with 1-4 bristles, no scales; hind tarsus with two claws.
Limatus Theobald
Wyeomyia Theobald
Family Cecidomyidæ—The Gall Midges


Small, delicate flies with broad wings and long antennæ and legs.

Head small; eyes round or reniform, sometimes holoptic; ocelli usually absent; antennæ long, cylindrical, the segments usually with bead-like swellings, ten to thirty-six in number; proboscis short, rarely elongated; palpi with one to four segments. Thorax ovate, more or less convex, without transverse suture; abdomen composed of eight segments; hypopygium small but projecting; ovipositor sometimes very long. Legs long and slender; coxae rather short; tibiae without terminal spurs, basal tarsal segment sometimes very short. Wings large, usually hairy, narrowed basally and without alula; three to five longitudinal veins, usually with only the first, third and fifth; humeral crossvein indistinct or absent; costal vein extending around the entire wing, the veins all weak, the fifth usually furcate; anterior crossvein situated very near the base of the wing, often appearing as the beginning of the third vein, the base of the third vein having the appearance of a crossvein; only one basal cell present.

These small flies may be found everywhere but the most satisfactory means of collecting them is to rear them. The larvae of most of the species live in living plants where they form galls, or deformities of various kinds, in the axils of the leaves, etc. Others live under bark, in decaying vegetation and in fungi while a few live upon plant lice, being found for the most part under the colony of aphids or in axils of the leaves during the day. Many of the species are inquilines in the galls formed by other members of the family or even by other orders of insects. The galls occur on all parts of plants, on the flowers, leaves,
Cecidomyidae I.—1, Lasioptera; 2, Porricondyla?; 3, Cecidomyia; 4, Hormomyia; 5, Trichopteromyia; 6, Lestremia; 7, Miastor; 8, Spaniocera?; 9, Catocha; 10, Colpodia; 11, Heteropeza; 12, Asynapta; 13, Winnertzia; 14, Lestodiplosis; 15, Winnertzia.
stems and roots and are usually characteristic for each species. The larvae may be recognized by the presence of a "breast bone" or chitinized process lying within the thorax and terminating behind the head. The phenomenon of pedogenesis occurs in some species belonging to the genus Miastor, that is the larvae produce eggs from ovary-like organs, the eggs hatch within the body and the young larvae devour the parent, later escaping and completing their development externally; several generations may be produced in this way, before the development of adult insects occurs.

The classification of the family is difficult and I have merely emended the key given by Dr. Felt. For the most part little can be done without preparing slides of the adults, the whole insect being mounted. It is advisable to preserve dried specimens as well as the mounts, and the galls should always be kept along with the adults. Study of the group should not be attempted by anyone who is not prepared to spend years of painstaking work on his hobby. Such a study would prove of inestimable value and would fully repay the student for the time spent. Many of the species are serious pests, the chief among these being the Hessian fly.

I may add that the study of the galls themselves constitutes a fascinating past-time and Dr. Felt has given us an excellent treatise on this subject and is, I believe, preparing a new and enlarged edition. The series of papers published by Dr. Felt is copiously illustrated and I have made free use of these illustrations. In connection with their use I cannot help but call attention to the splendid cooperation of Dr. C. C. Adams, of the New York State Museum, in furnishing the cuts used for this family and of Dr. Felt for assistance and suggestions. Most of the illustrations of Cecidomyiidae are from cuts furnished by the New York State Museum.

KEY TO GENERA

1. Circumfila present .................................................. 23
   Circumfila absent .................................................. 2

2. Wings with four longitudinal veins .................................. 3
   Wings with at most three longitudinal veins ..................... 17

3. Fourth vein forked .................................................. 4
   Fourth vein simple .................................................. 10

4. Second antennal segment greatly enlarged .......................... 5
   Second antennal segment normal .................................. 7

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* 1925. Key to Gall Midges (A resume of Studies, i-vii, Itonidae), N. Y. State Mus. Bull. No. 257. References to Parts i-vii will be found in this Bulletin.

(Courtesy New York State Museum, Albany, N. Y.)
5. Subcosta and third vein united as though by a very short crossvein.  
   Microcerata Felt
   Subcosta and third vein separate and with no trace of a crossvein... 6

6. Branches of the fork of the fourth vein even..............Konisomyia Felt
   Branches of the fork of the fourth vein irregular (22)...Tritozyga Læw

7. Flagellate antennal segments sessile, with a length only a little
greater than their diameter.................................Neocatocha Felt
   Antennal segments not sessile, more elongate............... 8

8. Antennæ with not more than ten segments.............Neptunimyia Felt
   Antennæ with at least eleven segments.................... 9

9. Costa ending at or a little beyond the tip of the third vein (6, 26).
   Lestremia Meigen
   Costa extending beyond the apex of the wing (9, 16)...Catocha Haliday

10. Third vein usually well separated from the costa and frequently
    uniting with it at or beyond the apex...................... 11
    Third vein rarely extending to the apex of the wing; flagellate anten-
    nal segments subsessile in female, ornamented with crenulate whorls
    or structures more complex than irregular whorls of simple hairs.. 14

11. Flagellate antennal segments globose, stemmed in both sexes, or the
    second enlarged ........................................... 12
    Flagellate antennal segments cylindrical, sub-sessile, the second not
    enlarged (23)..........................................Mycophila Felt

12. Fourth vein absent ........................................... 13
    Fourth vein present (28).................................Joannisia Kieffer

13. Antennal segments stemmed (5).........................Trichopteromyia Williston
    Antennal segments sessile, the second enlarged...........Ceratomyia Felt

14. Flagellate antennal segments with a more or less distinct subapical
    collar forming a more or less cup-shaped cavity; claws denticulate.
    Prionellus Kieffer
    Flagellate segments with subapical whorl of stemmed disks or spines. 15

15. Flagellate segments with subapical whorl of stemmed disks; claws
    with minute apical tooth ................................Monardia Kieffer
    Flagellate segments with spines ................................ 16

16. Flagellate segments with short, stout, usually recurved spines (24,
    27)...........................................Cordylomyia Felt
    Flagellate segments with short, stout, curved spines (32).
    Corinthomyia Felt

17. First segment of the tarsi shorter than the second............ 19
    First segment of the tarsi longer than the second......... 18

18. Tarsi with four segments; three longitudinal veins (7, 18).
    Miastor Meinert
    Tarsi with three segments; two longitudinal veins (11).
    Heteropeza Winnertz

19. Tarsi with five segments .................................. 20
    Tarsi with two segments..................................Oligarces Meinert

20. Wing membrane finely haired..........................Kronomyia Felt
Cecidomyidae III.—17, Asphondylia monacha; 18, Miastor americana.
(Courtesy New York State Museum, Albany, N. Y.)
21. Third vein extending to the apex of the wing......................... 22
   Third vein not extending to the apex of the wing............ Epimyia Felt
22. Palpi with four segments........................................ Johnsonomyia Felt
   Palpi with only one segment (29).......................... Leptosyna Kieffer
23. No crossvein uniting the third and first veins............... 29
   A distinct crossvein uniting the third and first veins.... 24
24. Crossvein parallel or nearly so with the costa and apparently forming a continuation of the third vein......................... 27
   Crossvein forming a well-marked angle with the costa........ 25
25. Four longitudinal veins........................................... 26
   Three longitudinal veins (10).................................. Colpodia Winnertz
26. Fifth vein absent .................................................. Parawinnertzia Felt
   Fifth vein well developed (13, 15, 25)..................... Winnertzia Rondani
27. Three or five longitudinal veins.................................. 28
   Four longitudinal veins (12).................................. Asynapta Loew
28. Three longitudinal veins .......................................... Dirhiza Loew
   Five longitudinal veins...................................... Hormosomyia Felt
29. Costa thickly scaled; third vein usually very close to anterior margin of wings; antennal segments cylindrical, sessile, short, never produced .................................................. 30
   Costa rarely thickly clothed with scales, the third vein well separated from it; antennal segments usually longer than wide........ 36
30. Third vein lying very close to the costa and uniting with it at or before the middle of the wing, rarely at the distal third........ 32
   Third vein well separated from the costa and uniting with it beyond the middle of the wing........................................ 31
31. Third vein and body thickly clothed with scales...... Trotteria Kieffer
   Third vein and body not thickly clothed with scales.
   Camptoneuromyia Felt
32. Mouth parts and thorax normal, not greatly prolonged........... 33
   Mouth parts and thorax prolonged............................ Clinorhyncha Loew
33. Palpi with one or two segments.................................. Asteromyia Felt
   Palpi with three or four segments............................ 34
34. Third and fourth antennal segments coalescent or closely fused.... 35
   Third and fourth antennal segments at least separated by a distinct constriction ............................................... Protaplonyx Felt
35. Three longitudinal veins, the fifth forked (1, 21)............. Lasioptera Meigen
   Four simple longitudinal veins.............................. Neolasioptera Felt
36. Flagellate antennal segments cylindrical, never binodose in the male... 37
   Flagellate antennal segments in the male greatly produced, binodose; circumfila usually forming long loops.......................... 60
37. Claws on at least one pair of legs toothed........................ 38
   Claws simple .................................................. 50
38. Palpi with four segments.......................................... 39
   Palpi with not more than three segments...................... 45
Cecidomyidae IV.—19, Rhabdophaga sp.; 20, Dasyneura gibsoni.
(Courtesy New York State Museum, Albany, N. Y.)
39. Antennæ with fourteen or more segments ........................................ 40
   Antennæ with ten to thirteen, rarely with fourteen segments ......... 43
40. Third vein uniting with the costa at or near the apex of the wing .... 41
   Third vein uniting with the costa well before the apex of the wing ... 42
41. Ovipositor not chitinized apically; claws with one strong tooth (19).
   **Rhabdophaga** Westwood
   Ovipositor chitinized apically, blade-like, the claws weakly toothed.
   **Procystiphora** Felt
42. Wing veins scaled, the membrane more or less brownish.
   **Lasiopteryx** Stephens
   Veins not distinctly scaled, the membrane hyaline (20).
   **Dasyneura** Rondani
43. Third vein uniting with the costa near the apex of the wing ........ 44
   Third vein uniting with the costa well before the apex of the wing. 45
44. Antennæ with thirteen or fourteen segments ....................... Cystiphora Kieffer
   Antennæ with twelve segments, genital harpes sickle-shaped, greatly
   produced .............................................................. **Harpomyia** Felt
45. Palpi with two or three segments .......................................... 46
   Palpi with only one segment ......................................... **Ficiomyia** Felt
46. Palpi with three segments ................................................ 48
   Palpi with two segments .............................................. 47
47. Antennæ with twelve segments ........................................... **Coccidomyia** Felt
   Antennæ with fourteen to eighteen segments .................. **Diarthronomyia** Felt
48. Claws with a single tooth .................................................. 49
   Claws pectinate ....................................................... **Ctenodaectylomyia** Felt
49. Ovipositor with apical spine; male clasper short, swollen.
   **Cystiphora** Kieffer
   Ovipositor without apical spine; pulvilli nearly three times as long
   as the claws ............................................................ **Allomyia** Felt
50. Flagellate antennal segments cylindrical, not greatly elongated, usu-
   ally stalked in the male; ovipositor not aciculate .................. 51
   Flagellate segments cylindrical, elongate, sessile; ovipositor usually
   aciculate ............................................................... 56
51. Palpi with one to three segments ........................................... 53
   Palpi with four segments ............................................... 52
52. Third vein joining the costa at or near the apex of the wing (31).
   **Phytophaga** Rondani
   Third vein joining the costa well before the apex of the wing.
   **Janetiella** Kieffer
53. Ovipositor distinctly chitinized, aciculate or cultriform.
   **Sackenomyia** Felt
   Ovipositor not chitinized .............................................. 54
54. Palpi with only one or two segments ....................................... 55
   Palpi with three segments ............................................. **Oligotrophus** Latreille
55. Pulvilli nearly twice as long as the empodium ....................... **Walshomyia** Felt
   Pulvilli shorter than the empodium .................................. **Rhopalomyia** Rübsaamen

(Courtesy New York State Museum, Albany, N. Y.)
56. Ovipositor protractile, aciculate or nearly so; terminal clasper of male usually unidentate or bidentate. ................. 57
Ovipositor exserted, with lobes or triangular plates apically; terminal clasper of male usually serrate apically. ................. 58

57. Palpi with four segments (33) ................................ Schizomyia Kieffer
Palpi with two or three segments (17) .......................... Asphondylia Loew

58. Palpi with four segments ........................................ 59
Palpi with three segments ........................................ 60

59. Flagellate antennal segments cylindrical, not strongly constricted; circumfila usually with many fine reticulations in the male; pulvilli usually shorter than the claws (31) .................. Cincticornia Felt
Flagellate segments cylindrical, sometimes rather strongly constricted; circumfila forming transverse series of low lines or loops; lobes of ovipositor subtriangular ............... Caryomyia Felt

60. Nodes of the male flagellate antennal segments equal, only two circumfila ................................. 61
Nodes of male flagellate segments plainly unequal, three circumfila. 71

61. Palpi with three or four segments ............................... 62
Palpi with one segment ........................................ 63

62. Palpi with four segments ........................................ 64
Palpi with three segments ........................................ 65

63. Terminal clasp segment irregular, pectinate apically, Pectinodiplosis Felt
Terminal clasp segment normal ................................. Dentifibula Felt

64. Claws on all the legs simple ................................... 67
Claws on at least the front legs toothed ........................ 65

65. Claws on all the legs toothed .................................. 66
Only the anterior claws toothed ................................. 68

66. Internal basal lobe of the basal clasp segment smooth, the dorsal and ventral plates broadly and slightly emarginate, the ovipositor with a length one-half that of the abdomen, protractile...Erosomyia Felt
Internal basal lobe of the basal clasp segment rudimentary, smooth; dorsal plate truncate, ventral plate broadly and roundly emarginate; ovipositor moderately long ........................ Mangodiplosis Tavares

67. Wings of males with the posterior area greatly produced and broadly rounded .......................... Lobopteromyia Felt
Wings normal, not unusually broad ............................... 68

68. Costa not clothed with scales .................................. 69
Costa thickly clothed with scales ............................... Endaphis Kieffer

69. Third vein interrupting the costa at its union with the margin .......................... 70
Third vein not interrupting the costa at its union with the margin (See text fig.) .......................... Thecodiplosis Kieffer

70. Wings hyaline ........................................... Contarinia Rondani
Wings spotted ............................................... Stictodiplosis Kieffer

71. Claws toothed on all the legs .................................. 72
Claws of at least the posterior legs not toothed .......................... 84

(Courtesy New York State Museum, Albany, N. Y.)
72. Palpi with four segments .................................................. 75
Palpi with three segments .................................................. 73

73. Basal clasp segment of male distinctly lobed .................. Peridiplosis Felt
Basal clasp segment of male not lobed ................................. 74

74. Flagellate antennal segments of female subcylindrical. Kalodiplosis Felt
Flagellate antennal segments of female binodose (Brit. Guiana). Epihormomyia Felt

75. Circumfila with one or more greatly produced bows or loops having a length five to ten times that of the enlargement and extending at approximately right angles to it. .................. 76
Circumfila all about equal, nearly regular .......................... 80

76. Three well-developed circumfila on each flagellate antennal segment. 77
Two well-developed, irregular circumfila; basal circumfila on the distal enlargement forming a low band; pulvilli small. Bremia Rondani

77. All three circumfila irregular, the pulvilli rudimentary. Tribremia Kieffer
At most two circumfila irregular ........................................ 78

78. Pulvilli shorter than the claws; two circumfila irregular .......... 79
Pulvilli as long as or longer than the claws; one circumfila irregular. Aphidoletes Kieffer

79. Pulvilli slightly shorter than the claws, conspicuous ... Isobremia Kieffer
Pulvilli rudimentary or wanting ...................................... Cryptobremia Kieffer

80. Basal clasp segment of male genitalia with basal lobe; ovipositor short and with large, orbicular lobes ........................................ Youngomyia Felt
Basal clasp segment without basal lobe ................................ 81

81. Claws curved at nearly right angles .................................. 82
Claws curved but not at nearly right angles .......................... 83

82. Ventral plate moderately long, broadly emarginate; dorsal plate moderately long, broad, deeply triangularly emarginate, the lobes triangular; ovipositor short. .................. Cleodiplosis Felt
Dorsal and ventral plates short, broad, deeply emarginate. Thomasia Rübsaamen

83. Ovipositor slightly protractile, the lobes long, curved, and with two or three subventral rows of obtuse spines ........ Dicrodiplosis Kieffer
Ovipositor about half the length of the abdomen, the lobes with a length about six times the width; mouth parts prolonged (Brit. Guiana) ................................................ Delphodiplosis Felt

84. Claws not toothed on any of the legs ............................. 92
Claws toothed on at least the front legs ............................. 85

85. Palpi with four segments .................................................. 86
Palpi with three segments .................................................. 84

86. Basal clasp segment lobed ............................................. 87
Basal clasp segment not distinctly lobed ............................. 89

87. The lobe basal or sub-basal .......................................... 88
The lobe apical, setose or spinose; terminal clasp segment subapical. Lobodiplosis Felt
Ceridomyidae VII.
88. Ventral plate or harpes strongly chitinized .......... Coquillettomyia Felt
Ventral plate or harpes not chitinized .......... Feltiella Rübsaamen
89. Terminal clasp segment sub-fusiform, distinctly dilated; harpes strongly chitinized and very complex (30) .......... Karschomyia Felt
Not as above ............................................. 90
90. Claws curved at nearly right angles .......... Clinodiplosis Kieffer
Claws not curved at nearly right angles .......... 91
91. Ventral plate almost linear, straight and much longer than the dorsal plate .......... Acaroletes Kieffer
Ventral plate not greatly produced .......... Mycodiplosis Rübsaamen
92. Palpi with fewer than four segments .......... 108
Palpi with four segments .......... 93
93. Third vein uniting with the costa behind the apex of the wing .......... 94
Third vein uniting with the costa before the apex of the wing.
Arthrocnodax Rübsaamen
94. Circumfila with short bows or wanting .......... 95
Circumfila well developed and not conspicuously irregular, the loops mostly as long as or longer than the diameter of the enlargement. 97
95. Some of the flagellate antennal segments cylindrical .......... 96
Flagellate antennal segments binodose in the male or presumably so.
Caryomyia Felt
96. Circumfila rudimentary or wanting; tenth to fourteenth segments cylindrical; harpes somewhat inflated .......... Prodiplosis Felt
Circumfila distinct though low, all the flagellate or only the distal segments cylindrical; ovipositor short .......... Caryomyia Felt
97. Claws bent at nearly right angles .......... 98
Claws not bent at right angles .......... 99
98. Ventral plate long, slender, slightly expanded and roundingly emarginate apically; dorsal plate short, triangularly emarginate .......... Giardomyia Felt
Ventral plate long, broad, very deeply and broadly emarginate; dorsal plate deeply and roundingly emarginate .......... Hyperdiplosis Felt
99. Basal clasp segment lobed .......... 100
Basal clasp segment not lobed .......... 103
100. The lobe apical .......... 101
The lobe basal .......... 102
101. The lobe very long, curved, setose; terminal clasp segment swollen basally .......... Epidiplosis Felt
The lobe triangular; terminal clasp segment short, greatly constricted near the middle and enormously swollen and recurved apically .......... Metadiplosis Felt
102. Wings spotted .......... Lestodiplosis Kieffer
Wings not spotted .......... Coprodiplosis Kieffer
103. Antennal segments plainly trinodose .......... Obolediplosis Felt
Antennal segments not plainly trinodose .......... 104


(Courtesy New York State Museum, Albany, N. Y.)
Cecidomyidae VIII.—34. Phytophaga destructor.
(Courtesy New York State Museum, Albany, N. Y.)
104. Antennal segments short, thick, the stems transverse, the enlargements short and broad; circumfila fine, rather short, each with about twenty loops.....................Retinodiplosis Kieffer

Antennae of normal form..................................105

105. Ventral plate linear or long and spatulate......................106

Ventral plate broad and broadly or triangularly emarginate....107

106. Ventral plate linear, rounded apically; dorsal plate shorter than the ventral, the lobes truncate..............Parallelodiplosis Rübsaamen

Ventral plate spatulate, the dorsal plate moderately long, deeply and triangularly emarginate, the lobes broad, obliquely and roundly emarginate .....................Hypodiplosis Kieffer

107. Dorsal plate deeply incised, the lobes narrowly rounded; terminal clasp segment with serrate margin........Paradiplosis Fell

Dorsal plate not incised or very narrowly emarginate; terminal clasp segment smooth (3)........................Cecidomyia Meigen

108. Palpi with three segments................................109

Palpi with only one or two segments..........................113

109. Circumfila with short bows or loops, their length being one-half the diameter of the enlargement or less.........................119

Circumfila loops with a length equal to the diameter of the enlargement or longer......................................................112

110. Thorax plainly extending over and concealing the head to a certain extent ..................................................................................111

Thorax not produced over the head to a marked degree...........................................Caryomyia Felt

111. Males with fifteen to at least twenty-seven antennal segments; female with fourteen or more antennal segments; ovipositor short (4).

Hormomyia Løw

Male and female with fourteen or fifteen antennal segments, the fifteenth rudimentary; ovipositor moderately long.

Trishormomyia Kieffer

112. Basal clasp segment lobed..................................Odontodiplosis Felt

Basal clasp segment simple........................................Adiplosis Felt

113. Palpi with two segments...........................Dischormomyia Kieffer

Palpi with one segment...........................................114

114. Wings hyaline ..................................................115

Wings marked with black and yellow..........................Astrodiplosis Felt

115. Fourteen antennal segments in both sexes.........................116

Thirteen segments in female, the third and fourth fused, the basal and distal nodes in the male flagellate antennal segments globeose and ovoid respectively; dorsal and ventral plates bilobed; ovipositor short, chitinous, falcate.............Cystodiplosis Kieffer & Jorg

116. Both dorsal and ventral plates deeply emarginate; ovipositor short, chitinous, falcate..................Monarthropalpus Rübsaamen

Ventral plate not deeply emarginate................................117

117. Dorsal plate deeply and ventral plate broadly emarginate; ovipositor stout, half as long as the abdomen, the distal part thickly clothed with long, silky hairs..........................Onodiplosis Felt

Dorsal plate deeply, broadly and roundly emarginate, the lateral margin extended ventrally; ventral plate broadly emarginate; ovipositor stout, about two-thirds as long as the abdomen.

Horidiplosis Felt
Family Sciaridæ—The Dark Winged Fungus Gnats

Sciara ♂.

Usually small, blackish, brownish or testaceous species, the abdomen cylindrical and tapering, especially in the females.

The insects belonging to this family are related to the Mycetophilidæ, with which they have, until recently, been united. They differ in having the eyes produced toward each other above the antennæ, instead of being regularly convex in outline, and in having shorter coxæ. As a general rule the wing venation is typical although a very few genera of the Mycetophilidæ have similar venation.

The adults inhabit moist places or any place where fungus growth occurs, particularly manure. The larvæ frequently become pests, in mushroom cellars, feeding upon the mycelium of the fungi. The females are difficult to determine, the classification being based mainly on the male genitalia although the ovipositors of the females also offer good characters. The larvæ, like those of the Mycetophilidæ, have some very interesting habits, some of them sometimes travelling over the ground in snake-like masses. The family is treated by Johannsen in the reference given under the Mycetophilidæ.
KEY TO GENERA

1. Proboscis longer than the thorax (2) ..................Eugnoriste Coquillett
   Proboscis not greatly elongate ........................................ 2

2. Wings conspicuously hairy; claws never denticulate...Trichosia Winnertz
   Wings with microscopic setulae but not hairy...................... 3

3. Claws toothed ................................................................. 4
   Claws not toothed ........................................................... 5

4. Forks of the fourth vein arcuate.........................Metangela Rubsaamen
   Forks of the fourth vein not arcuate.........................Phorodontia Coquillett

5. Face strongly produced..........................Rhynchosciara Rubsaamen
   Face not produced .......................................................... 6

6. Forks of the fourth vein arcuate; antennae of the male pedicellate and
   with whorls of hair (1)................................................Zygoneura Meigen
   Forks of the fourth vein not arcuate; antennae never pedicellate
   (Neosciara) (6, 7, Mycetophilidae)..............................Sciara Meigen

Sciaridæ.—1, Zygoneura; 2, Eugnoriste.
Family Mycetophilidae—The Fungus Gnats

Moderately small, rather delicate, slender flies with elongated coxae.

Head small, rounded or somewhat elongate, usually closely applied to the thorax. Eyes round, rather prominent; ocelli three, two or none, the median one often small, the lateral ones frequently close to the orbits; front broad in both sexes. Antennae elongated, composed of twelve to seventeen segments, the two basal segments large or differentiated, the others cylindrical, flattened or petiolated. Proboscis usually short, rarely greatly lengthened; palpi rarely absent, composed of three or four segments, usually inflexed. Thorax distinctly to strongly arched, without transverse suture; scutellum small; metanotum large. Abdomen composed of six or seven segments, cylindrical or compressed either laterally or dorsoventrally, sometimes narrowed basally; male genitalia projecting; ovipositor pointed, usually with two terminal lamellae. Legs more or less elongated, the femora usually thickened; coxae elongated; tibiae with spurs and usually with series of short or conspicuous bristles. Wings large; auxiliary vein present though sometimes very short; second longitudinal vein absent, or simulating a crossvein; third vein arising from the first vein, usually at such an angle as to simulate a crossvein, the crossvein sometimes appearing to form the base of the third vein; fourth and fifth veins usually fureate, sometimes simple; sixth vein sometimes rudimentary, never fureate; the seventh usually short, often rudimentary or entirely absent; discal cell absent, the second basal cell often open apically.

The adults are found in moist places, especially about decaying wood, on mossy rocks or moist humus, and prefer dark places. Many of the species are quite small only a few being large and conspicuous. They occur in a variety of habitats and some species are very restricted in habitat although occurring over a very wide geographical range. They may be collected throughout most of the year and when encountered often occur in large numbers. The larvae live in moist soil, wood, fungi, etc., and probably feed upon fungus growth. Pupation takes place outside the larval skin, some species spinning cocoons. The habits of the larvae are particularly interesting and their investigation should provide an entertaining and profitable field of study to some one interested in pure science for the fun of the thing. Johannsen* has monographed the family and only a small number of North American species have been described since.

FAMILY MYCETOPHILIDÆ—THE FUNGUS GNATS

KEY TO GENERA*

1. Second basal cell closed apically .................................................. 2
Second basal cell open apically .................................................. 12

2. Anterior branch of third vein at least half as long as posterior branch; auxiliary vein short, ending free; posterior divisions of pronotum with one or more long bristles (Ditomyiinae) .................................. 11
Anterior branch of third vein less than half as long as posterior branch, in some cases vestigial or absent; auxiliary vein in most cases long and ending in the costa; posterior divisions of pronotum without long bristles .................................................. 3

3. The second basal cell much shorter than the first; first and second basal cells separated (Bolitophilinae) (18) ................. Bolitophila Meigen
The second basal cell almost as long as the first or the basal sections of the third and fourth veins fused for a short distance .................. 4

4. Both crossveins closing the basal cells present, nearly in a straight line; basal section of fourth vein lacking (Diadociinae) (19).
Diadocidia Ruthé
Basal sections of third and fourth veins fused for a short distance except in Paleoplatyura in which basal section of fourth vein is present 5

5. Antennæ long and slender, in most cases longer than the body (Macrocerina) (4) ................................................. Macroceras Meigen
Antennæ more robust, in some cases distinctly thickened and flattened (Ceroplutinae) .................................................. 6

6. Proboscis prolonged into a snout ............................................ Asindulum Latreille
Proboscis not prolonged into a snout ........................................ 7

7. Antennæ conspicuously flattened; palpi porrect (Heteropterna, Ceroplatina, Euceroplatus) (5) ..................................... Ceroplatus Bosc
Antennæ not conspicuously flattened, palpi curved ......................... 8

8. The anterior crossvein not obliterated by the fusion of the bases of the third and fourth veins (20) ................................... Paleoplatyura Meunier
The anterior crossvein not obliterated by the fusion of the base of the third and fourth veins .................................................. 9

9. Basal section of fourth vein absent (Isoneuromyia, Neoplatyura, Proceroplatus, Lapyruta, Mierapemon) (9) .................. Platyura Meigen
Basal section of fourth vein present ............................................. 10

10. Ocelli wanting; anterior branch of third vein ending in the costa.
    Hesperodes Coquillett
Ocelli present, anterior branch of third vein ending in the first vein (21) .................................................. Apemon Johanssen

11. Fork of fourth vein distal of fork of third vein (22) . Ditomyia Winnertz
Fork of fourth vein basal of fork of third vein (14) . Symmerus Walker

12. First and third veins arising separately at base of wing; venation defective; proboscis elongate (Lygistorrhinae) (Probolaeus) (2, 3).
Lygistorrhina Skuse
First and third veins arising from a common stem well beyond base of wing .................................................. 13

* Checked by Dr. O. A. Johanssen.
13. Eyes joined above the antennae by a narrow bridge; anterior crossvein long, appearing like the base of the third vein, the latter short and transverse, resembling a crossvein. See Sciaridae. Eyes not joined by a narrow band above the antennae; base of third vein and the anterior crossvein in most cases oblique.  

14. Prothorax without long bristles, antennae inserted above the middle of the head, occiput flat or concave, venation defective (Manotinae) (1).

Manota Willistom

Prothorax with long bristles, occiput convex, antennae inserted at or below the middle of the head.  

15. Microtrichia of wings irregularly arranged or absent; auxiliary vein usually long; lateral ocelli in most cases far from margin of compound eyes (Sciophilinae Edwards = Sciophilinae Johannsen + Series I of Mycetophilinae Johannsen 1911).  

16. Microtrichia in more or less definite longitudinal lines; auxiliary vein usually short; lateral ocelli touching compound eyes (Mycetophilinae Edwards, Mycetophilinae Johannsen 1911, Series II).

Mycetophilidae: 1.—1, Manota defecta; 2, 3, Lygistorrhina singularis; 4, Macrocera concinna; 5, Ceroplatus longimanus; 6, 7, 8, Sciarana (Sciaridae); 9, Platyura ignobilis; 10, Sciophila diluta; 11, Neoempheria maculipennis; 12, Phthinia fraudulenta; 13, Leia nitens; 14, Symmerus; 15, Mycetophila insipiens; 16, Tetragoneura sylvatica; 17, Dynatosoma fuscicornis.
16. Ocelli two, approximated; wings without macrotrichia (hairs) on membrane; auxiliary vein reaching at least the base of the third vein; fine tibial setae in regular longitudinal rows. 19
Ocelli three, if but two (in *Eudicrana*) they are close to the eye margin. 17

17. Wing with macrotrichia (hairs) on membrane. 20
Wing without macrotrichia on membrane. 18

18. Apical segment of first vein several times longer than the anterior crossvein; branches of fourth vein longer than the petiole. 32
Apical segment of first vein short, in most cases not much longer than the crossvein, or if longer the branches of fourth vein scarcely longer than the petiole. 38

19. Costa not produced beyond tip of third vein; no spurious vein between third and fourth veins; wing not banded (23). *Mycomya* Rondani
Costa produced beyond tip of third vein; spurious vein usually present between third and fourth veins; wing banded or spotted (11). *Neoempheria* Osten Sacken

Ocelli three, remote from compound eyes. 21

21. Fork of fifth vein situated nearer to wing base than is the fork of fourth vein. 22
Fork of fifth vein, if present, situated beyond fork of fourth vein. 27

22. Postnotum with hairs or bristles. 23
Postnotum bare. 26

23. Anterior branch of fourth vein complete or nearly so. 24
Anterior branch of fourth vein faint or defective at base; third vein undulate (*Odontopoda*). 24, *Neuratelia* Rondani

24. Subcostal crossvein before middle of auxiliary vein (25). *Allocotocera* Mik
Subcostal crossvein beyond middle of auxiliary vein. 25

25. Third vein straight; costa not produced beyond its tip (Diomonus) (26). *Leptomorphus* Curtis
Third vein undulate; costa produced beyond its tip (27). *Polylepta* Winnertz

26. Metapleura hairy; auxiliary vein ending in first vein; body stout (28). *Syntemna* Winnertz
Metapleura bare; auxiliary vein ending in the costa; body long and slender (29). *Paratinia* Mik

27. Legs slender and extremely long; basal tarsal segment of anterior legs twice as long as the tibia; fourth vein forks broadly (12). *Phthinia* Winnertz
Legs normal; fork of media pointed. 28

28. Second branch of fourth vein complete. 29
Second branch of fourth vein detached, present only as a short element on the wing margin (30). *Azana* Walker

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FAMILY MYCETOPHILIDÆ—THE FUNGUS GNATS
29. Subcostal crossvein well beyond origin of third vein; mesopleura bare.  
   **Megalopeima** Enderlein  
   Subcostal crossvein just before, above or immediately beyond origin of third vein .................................................. 30

30. Fifth vein forked; mesopleura with small hairs (10) ...Sciophila Meigen  
   Fifth vein simple; mesopleura bare ........................................ 31

31. Macrotrichia (hair) reflected toward base of wing (31) ...Monoclonia Mik  
   Macrotrichia decumbent (32) ........................................... *Acnemia* Winnertz

32. Seventh abdominal segment large in both sexes (for **Polylepta leptogaster**)  
   Seventh abdominal segment small and retracted, at least in the male .......................... 33

33. Fifth vein forks well beyond fork of fourth (33) ....... **Coelosia** Winnertz  
   Fifth vein forks before, below or just beyond fork of fourth ........................................ 34

34. Auxiliary vein ends in the first vein ........................................ 35  
   Auxiliary vein ends in the costa .......................................... 36

35. Proboscis produced, about as long as the head (34) **Hadroneura** Lundstrom  
   Proboscis not produced (35) ........................................... **Dziedzickia** Johannsen

36. Proboscis very elongate (36) ........................................... *Gnoriste* Meigen  
   Proboscis not elongate .................................................. 37

37. Subcostal crossvein well beyond middle of auxiliary vein (**Empalia**)  
   Subcostal crossvein absent or near middle of auxiliary vein (38, 55).  
   **Boletina** Staeger

38. Auxiliary vein ends in the costa (extremity may be faint in species of **Leia**) .................................................. 39
   Auxiliary vein short, ending free or in the first vein .................. 40

39. Last section of first vein over twice as long as anterior crossvein;  
   anterior branch of fourth vein in most cases detached at base; sub-  
   costal crossvein wanting (39) ........................................... **Rondaniella** Johannsen  
   Last section of first vein scarcely longer than the crossvein, in some  
   cases shorter (13) .................................................. **Leia** Meigen

40. Palpi minute, consisting of a single segment; female wingless; in the  
   male the basal section of fourth and fifth veins are coalescent so  
   that both branches of the fifth appear to arise from the basal sec-  
   tion of the fourth vein (47) ........................................... *Pnyxia* Johannsen  
   Palpi well developed, female winged, venation various .................. 41

41. Lateral ocelli contiguous with the margin of the compound eyes; last  
   section of first vein long, petiole of fourth vein short; hypopleura  
   hairy (10) .......................................................... *Docosia* Winnertz  
   Lateral ocelli remote from eye margins; last section of first vein  
   shorter ................................................................................. 42

42. Hypopleura hairy; hind tibial comb present (41).  
   **Megophthalmidia** Dziedzicki  
   Hypopleura bare; no tibial comb ........................................ 43

43. Auxiliary vein rather long, ending in first vein; fifth vein forks near  
   base of wing .......................................................... **Ectrepesthioneura** Enderlein  
   Auxiliary vein very short, ending free; fifth vein forks near the middle  
   of the wing (16) .......................................................... **Tetragoneura** Winnertz
Mycetophilidae III.—44, Rhymosia; 45, Brachypeza; 46, Allodia; 47, Pnyxia scabei; 48, Cordyla; 49, Phronia; 50, Trichonta; 51, Mycetophila dominicana; 52, Epicypta; 53, Zygomyia; 54, Sceptonia; 55; Boletina incompleta.
44. Mesopleural and hypopleural bristles absent; hind coxa with a fairly strong bristle at base
Mesopleural bristles present; hind coxa usually without basal bristle

45. Costa produced beyond tip of third vein
Costa ends at tip of third vein

46. Fifth vein forks beyond fork of fourth
Fifth vein forks below or before fork of fourth

47. Second anal vein strong and distinct
Second anal vein weak or absent

48. First anal vein very long and distinct, attaining the middle of the fork of the fifth vein
First anal vein shorter and less distinct

49. Pteropleural bristles present; tibial bristles long and strong
Pteropleural bristles absent

50. Tibial bristles long and strong; auxiliary vein ends in first vein
Pronotal lobes with long bristles; fifth vein forks scarcely if any before the anterior crossvein

51. Second palpal segment greatly thickened
Second palpal segment normal

52. Fifth vein forks beyond fork of fourth; auxiliary vein ends free
Fifth vein forks below or before fork of fourth; auxiliary vein ends normally in the first

53. Fifth vein forked
Fifth vein simple

54. Anterior branch of fifth vein slightly divergent apically from second branch of fourth but parallel with or convergent towards second branch of fifth; hypopleura and pteropleura generally quite large
Anterior branch of fifth parallel with second branch of fourth but slightly divergent from second branch of fifth

55. Pronotal lobes with long bristles; fifth vein forks scarcely if any before the anterior crossvein
Pronotal lobes without long bristles; fifth vein forks well before the anterior crossvein

56. Second branch of fourth and first branch of fifth vein slightly divergent; hypopleura and pteropleura large; middle tibia with ventral bristles
Second branch of fourth and first branch of fifth vein parallel; hypopleura and pteropleura small; middle tibia without ventral bristles
Family Bibionidæ—The March Flies

Slender flies of small to medium size, ranging from four to twelve millimeters in length.

Head usually somewhat flattened; eyes of the males approximate or contiguous, of the females, broadly separated; face rather short, sometimes elongate in Dilophus; eyes round; ocelli large. Antennae composed of eight to twelve segments, cylindrical or somewhat flattened, the segments rather closely united. Proboscis short, with thickened, hairy labellæ; palpi with two to five segments, usually short, sometimes long. Thorax without transverse suture; scutellum hemicircular. Abdomen composed of seven to nine segments, more or less flattened, the male genitalia rather small. Legs moderately long, the anterior femora usually thickened, sometimes greatly swollen, the other femora usually somewhat swollen; anterior tibiae usually modified, often greatly swollen in Bibio; legs slender in Plecia. Pulvilli and usually the empodium distinct. Wings large, the anterior veins stout, the others usually considerably weaker; costa ending at or before the wing-tip; second vein present or absent; fourth vein furcate; basal cells complete; anal cell rarely closed; posterior crossvein absent.

The larvae feed upon decaying vegetable matter, especially upon the roots of grass, and pupation takes place in the soil. The adults are frequently very common and may be found almost anywhere in the open. The name ‘March Flies’ has been given the family in this country because of the frequent occurrence of Bibio albipennis Say in large numbers during this month. ‘Harlequin Flies’ is used in England, while ‘March Flies’ is applied to other flies in Australia. The family has been reviewed by MacAtee*.

KEY TO GENERA

1. Third vein furcate (6, 7) ................................................................. 2  
   Third vein not furcate (5) .......................................................... 5

2. Fourth and fifth veins forked ...................................................... 3  
   These veins not forked ......................................................... Eupeitenus Macquart

3. Antennæ with not more than 12 segments ................................... 4  
   Antennæ with 16 segments (7) .............................................. †Cramptonomyia Alexander

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† For a discussion of the position of this genus and its allies see Alexander, 1931, Bull. Brooklyn Ent. Soc. xxvi, pp. 7-11.
4. Distance between the fork of the fourth vein and the anterior crossvein more than twice the length of the crossvein (4).

   Hesperinus Walker

Distance between fork of fourth vein and anterior crossvein much less than twice the length of the crossvein (6)........Plecia Wiedemann

5. Anterior tibiae produced apically to form two spurs (3)................... 6
   Anterior tibiae without such spurs but with two or three series of teeth
   (2) ......................................Dilophus Meigen

6. Third and fourth longitudinal veins coalescent for a short distance (1) ......................................Bibiodes Coquillett
   Third and fourth veins not coalescent, joined by the anterior crossvein (3, 5) ......................................Bibio Latreille

Bibionidae.—1, Bibiodes; 2, Dilophus, front tibia; 3, Bibio, front tibia; 4, Hesperinus; 5, Bibio; 6, Plectia; 7, Cramptonomyia.
Scatopsidae 1.
Family Scatopsidæ—The Minute Black Scavengers

Small black or brownish flies, the appendages and thorax often partly yellowish.

Head more or less orbicular—subquadrate or elongate oval; antennæ composed of seven to twelve segments; usually slightly longer than the head; three ocelli; proboscis short and stout. Thorax gently convex, rarely flattened. Legs short, the femora robust. Wings with the veins thin, the first and third strong, the second simulating a crossvein, the fourth vein furecate or simple. Abdomen subcylindrical, composed of six or seven segments, the male genitalia large.

The Scatopsidæ breed in decaying vegetable and animal matter and excrement. They often breed in sewers and privies and frequently become very numerous in houses, where they cause more anxiety than harm. In the autumn they are frequently common on windows, when they are most easily collected. The species range in size from .75 to 3 mm. in length and the family may be readily recognized by the wing venation. Melander* has revised the North American species.

KEY TO GENERA

1. Wings of normal size. .......................................................... 2
   Wings about half normal size, the adults flightless (4).
   Cobaldia Melander

2. Front tibiae ending in a spur (5) .................. Aspistes Meigen
   Front tibiae without apical spur .................................. 3

3. Anterior branch of the fourth vein without appendage ............... 4
   Anterior branch of the fourth vein with an appendage near the base
   on the anterior side (12) .................................. Scatops Geoffroy

4. Anterior branch of the fourth vein not disconnected at the base (10) 5
   Anterior branch of the fourth vein disconnected basally (7) .......... 7

5. Petiole of the fourth vein more than twice as long as the anterior
   branch (10) .................................. Swammerdamella Enderlein
   Petiole of the fourth vein at most a little longer than the anterior
   branch .......................................................... 6


Scatopsidæ I—1, 2, 3. Rhegmoclema atrata, larva, pupa, adult; 4, Coboldia formicarum; 5, Aspistes berolinensis; 6, Psecatosciara californica.
6. Third vein ending well beyond the middle of the wing (9).

Reichertella Enderlein

Third vein ending before or at the middle of the wing (1, 2, 3, 11).

Rhegmoclema Enderlein

7. Third vein ending at or near the middle of the wing (7).

Aldrovandiella Enderlein

Third vein ending at the apical fourth of the wing (6, 8).

Psectrosciara Kieffer

Scatopsidae II.—7. Aldrovandiella; 8, Psectrosciara; 9, Reichertella uncinata; 10, Swam-merdamella brevicornis; 11. Rhegmoclema aterrima; 12. Scatopse notata. (All figures after Melander.)
Family Rachiceridae

Flies of medium size, elongated, very thinly pilose, resembling sawflies.

Males dichoptic. Empodium developed pulvilliform, the pulvilli present. Antennae composed of twenty to thirty-eight segments, often strongly serrate. Squamae small or rudimentary. Veins strong; discal cell three times as long as wide; fourth posterior cell closed and petiolar; anal cell closed apically. Legs moderately long.

The only genus belonging to this family is Rachicerus Walker of which only about a score of species are known. Six species have been described from the Nearctic region, but one is unrecognizable.

The larvae are found in decaying wood and are presumed to be predaceous.

Rachicerus has usually been placed in the Rhagionidae (s. 1.) but should no doubt be isolated since the large number of antennal segments, all of which are freely articulate, indicates a more primitive condition than that accorded even the Coenomyiidae of the present work.

KEY TO NEARCTIC SPECIES OF RACHICERUS

1. Antennae reddish toward the base, pectinate below, the lower processes conspicuously longer than the upper..........................obscuripennis Leew
   Antennae not reddish basally, the lower processes on the segments short, at most slightly longer than the upper.................................2
2. Mesonotum brownish yellow, sometimes with brown vittae, never blackish .................................................................4
   Mesonotum black or brownish black........................................3
3. Halteres yellow; wings hyaline with a dark median cloud in front;
   mesonotum shining black......................................................nitidus Johnson
   Halteres brownish; wings tinged with brown; mesonotum shining dark brown.................................................................niger Leonard
4. Mesonotum without brown vittae; ♀ antennae serrate, with 21 or 22 segments, ♂ antennae sub-pectinate below, with 28 to 35 segments.
   fulvicollis Haliday
Mesonotum with two broad brown vittae; antennae sub-pectinate below, with 22 or 23 segments.........................honestus Osten Sacken

Rachicerus, head and wing.
Family Stratiomyidæ—The Soldier Flies

Small to moderately large, nearly bare or thinly pilose flies, without bristles.

Head usually short, sometimes produced either at or below the antennæ, usually wider than the thorax; ocelli present; eyes dichoptic in the females, usually holoptic in the males; proboscis short, never longer than the headheight, palpi two segmented or rudimentary. Antennæ with three to ten segments, the third always annulate and usually bearing an apical style or arista or a dorsal arista. Thorax never strongly convex, often elongate; scutellum often with spines, tubercles or projections on the margin. Abdomen composed of five to seven segments, variable in shape, sometimes short and very broad or long and narrow, rarely petiolate. Legs thinly soft haired; pulvilli and empodium pad-like, the tibiae without spurs. Costal vein not reaching beyond the tip of the wing, the veins crowded anteriorly, the posterior ones weak; discal cell present and of characteristic shape; four or five posterior cells and one or two submarginals; anterior branch of third vein short and often indistinct or wanting.

The name "soldier flies" has been given to this family because of their conspicuous markings. Most of the species may be found on flowers, some of them hover, while others may be found on foliage and in long grass near water.

The larvae are predaceous or live in decaying vegetation, under bark, in rotting fruit, etc. A few species are confined to the sea coast while others occur in fresh water or mud.

I have adopted a number of changes in the nomenclature, and, as I do not use the names proposed in Meigen's "1800" paper Eulalia does not replace the well-known Odontomyia. The name Stratiomyia is an emendation of the original spelling, Stratiomys, and not only
changes the spelling but also the meaning. I suspect that Geoffroy had in mind the mouse-like character of the typical species of the family when he proposed the name, and that he was better aware of his intentions in this connection than those who have followed the spelling of Macquart. It is unfortunate that such a well known name as *Clitellaria* Meigen must be replaced by *Adoxomyia* for the American species previously listed under *Clitellaria*. The other changes are mostly a return to the original spellings or the realignment of genera based upon structural characters.

The family is a difficult one, the generic limits being, often, difficult to define if they actually exist. Unfortunately I lack representatives of a few of the genera and must rely upon descriptions, so that some characters which might be used have, of necessity, been omitted.

There is great need of a monograph of the American species of this family: my synopsis of the Canadian species* may prove helpful but it contains only keys and these are incomplete for most of the genera.

**KEY TO GENERA**

1. Abdomen with seven visible dorsal segments ........................... 2
   Abdomen with five or six segments ....................................... 9

2. Three posterior veins or stumps of veins, the third usually arising from the discal cell ................................................................. 4
   Four posterior veins or vestiges of them, all arising from the discal cell ................................................................. 3

3. Posterior femora thickened ........................................... *Neexaireta* Osten Sacken
   Posterior femora but little thickened, the posterior tibiae noticeably thickened (82) ................................................................. *Actina* Meigen

4. Scutellum with spines or denticulations ..................................... 6
   Scutellum without spines ......................................................... 5

5. Third vein branched (33) ............................................... *Allognosta* Osten Sacken
   Third vein not branched (1, 87) ........................................... *Chiromyza* Wiedemann

6. Scutellum with fewer than ten spines .................................. 7
   Scutellum with ten or twelve spines or teeth ................................ 8

7. Head hemispherical; antennae situated near the middle of the head (2, 3) ........................................ *Beris* Latreille
   Head not hemispherical; antennae situated well below the middle of the head ................................................................. *Berismyia* Giglio-Tos.

8. Scutellar spines long .................................................. *Heteracanthia* Macquart
   Scutellum with about twelve short teeth .................................. *Antissops* Enderlein

9. Three posterior veins, all arising from the discal cell ................ 10
   Four posterior veins, the first and third sometimes vestigial but at least represented by angulations of the discal cell .................. 22

FAMILY STRATIOMYIDÆ—THE SOLDIER FLIES

Stratiomyidae III—37, Oxyera albovittata; 38, Rhingiopsis restrata; 39, Plecticus testaceus; 40, Neorondania chalybea; 41, Gowdeyana mirabilis; 42, Odontomyia (sp. Panama); 43, Cacosis; 44, Eucilidellaria; 45, Chrysocroma nigricornis; 46, Heritia (n. sp. Panama); 47, Cyphomyia; 48, Microchrysa polita.
10. Antennæ situated at most a little below the middle of the head in profile; scutellum never with two spines ........................................... 13
   Antennæ situated far below the middle of the head, near the lower edge of the eyes; scutellum with at least a pair of spines.................. 11

11. Third antennal segment not furcate; scutellum bispinose............. 12
   Third antennal segment furcate, the upper branch with a terminal arista
   and a lateral process (72, 78) ..............................................Neochauna Williston

12. Eyes bare ................................................Pssegmomma Enderlein
   Eyes pilose (6, 86) ..........................................................Acanthinomyia Hunter

13. Third vein branched .................................................. 15
   Third vein simple ............................................................. 14

14. Third antennal segment elongate (55, 56).........................Berkshiria Johnson
   Third antennal segment short, as broad as long (54, 58).
   Zabrachia Coquillett

15. Third antennal segment elongate........................................... 16
   Third antennal segment as wide as long or nearly so.................. 17

16. Scutellum prolonged and obtusely pointed, without conspicuous rim on lower edge .......................................................Cypipimorpha Brauer
   Scutellum broadly rounded apically and with a strong rim on the lower
   margin (55, 56) ...............................................................Berkshiria Johnson

17. Scutellum prolonged, its sides more or less parallel apically or triangular with a very broad preapical depression, the lower edge not margined (4, 5, 60) .....................................................Psphiocera Enderlein
   Scutellum rounded apically, its lower edge sometimes very strongly
   margined .................................................................................... 18

18. Arista short plumose or with very long pubescence of isolated hairs (49) ..............................................................Lophoteles Low
   Arista short pubescent or bare ............................................. 19

19. Antennæ arising at most slightly below the middle of the head........20
   Antennæ arising conspicuously below the middle of the head (61).
   Pachygaster Meigen

20. Scutellum with a strong marginal rim below ................................21
   Scutellum with at most a very weak rim below (27, 57).
   Neopachygaster Austen

21. Rim of scutellum strongly serrate (62) .................Eupachygaster Kertesz
   Rim of scutellum so finely serrate as to appear smooth except under
   high magnification (41, 51) ..............................................Gowdeyana Curran

22. All the posterior veins arise from the discal cell .................. 23
   The fourth posterior vein arises from the second basal cell........... 39

23. Scutellum with spines .................................................. 24
   Scutellum without spines, sometimes denticulate........................ 32

* I have not seen the type of this European genus and it may be that the species
   described by Malloch as belonging here belongs to Vittiger Kertesz.
Stratiomyidae IV.—49, Lophoteles pallidipennis, after Williston; 50, Neurota tricolor; 51, Gowdeyana mirabilis; 52, Zabrachia polita ♂; 53, Berismia nigrofemorata; 54, Zabrachia polita ♀; 55, Berkshiria, scutellum; 56, Berkshiria; 57, Neopachygaster maculicornis; 58, Zabrachia polita; 59, Gynenyparea lasiophthalmus; 60, Psephiocera minuta, after Williston; 61, Brachygastrer pulcher; 62, Enpachygaster punctifer; 63, Merosargus bulbifrons.
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<td>Antennae with three segments, the third annulate (28) ............................................. Scoliopelta Williston</td>
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<td>Second antennal segment twice as long as the first ................................................ Glaris Kertesz</td>
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<td>Second antennal segment not longer than the first (20, 21, 90) ............................... Euparyphus Gerstäcker</td>
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<td>Antennae with a bristle-like style (23) .............................................................. Pelagomyia Williston</td>
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<td>Antennal style almost as long as the third antennal segment, quite flat and shining; the thin sides densely fringed with long pubescence (9, 10, 46) ................................................. Hermetia Latreille</td>
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<td>38.</td>
<td>Antennal style different in structure or the antennae with an arista ................................ Arkionia Hine</td>
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<td>Third antennal segment without an arista, the style absent or but poorly differentiated, rarely short and bristly ................................................................. 40</td>
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<td>Third antennal segment with an arista ........................................................................ 51</td>
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<td>Third vein without anterior branch ........................................................................... 44</td>
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<td>Head strongly produced anteriorly and with a porrect spine or protuberance below the antennae (35, 38, 83) ...................................................... Rhingiopsis Röder</td>
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<tr>
<td>44.</td>
<td>Head not produced, the face sometimes produced conically downward ......................... 42</td>
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Stratiomyidae V.—64, Nemotelus arator; 65, Euclitellaria subulata; 66, Neurota tricolor; 67, Raphiocera armata; 68, Euryneura panamensis, n. sp.; 69, Premetanisa nasuta; 70, Analcocerus; 71, Histiodroma inermis; 72, Neochauna; 73, Chordonota; 74, Stratiomys mutabilis; 75, Nothomyia calopus; 76, Gyneuryparea lasiophthalmus; 77, Aloipa cingulatus.
42. Eyes bare ......................................................43
Eyes thickly pilose in the ♀, pilose on lower half in ♂ (59, 76).

*Gyneuryparia* Enderlein

43. Antennae situated near the lowest level of the eyes (32).

*Myxosargus* Brauer

Antennae situated near the middle of the eyes in profile (17, 47).

*Cyphomyia* Wiedemann

44. Scutellum without spines ........................................45
Scutellum with spines ..........................................46

45. Third antennal segment with eight annuli (73, 80). *Chordonota* Gerstaecker
Third antennal segment with five or six annuli (11, 12, 12).

*Odontomyia* Meigen

46. Costa not thickened distally ....................................47
Costa strongly thickened distally (26, 70) ....................Analcocerus Loew

47. Third antennal segment composed of seven or eight annuli ..........50
Third segment composed of not more than six annuli ..........48

48. Head very strongly produced forward, the face strongly receding (69, 85).

*Promeranisa* Walker

Head rarely produced forward, if so the antennal prominence not con-
stricted .................................................................49

49. First antennal segment three times as long as the second (13, 74, 79).

†*Stratiomys* Geoffroy

First segment less than three times the length of the second (11, 12, 12).

*Odontomyia* Meigen

50. First antennal segment two or three times as long as the second.

*Campeprosopa* Macquart

First antennal segment but little longer than the second, the third ter-
minating in a bristle (40) ........................................ *Neorondania* Osten Sacken

51. Scutellum with spines ............................................52
Scutellum without spines .......................................53

52. Third vein not furcate (75) .....................................54
Third vein furcate (31, 67) ...................................... *Raphiocera* Macquart

53. Space between the second vein and the costa chitinized, the costa ex-
panded on the apical half (19, 71) ............................. *Histiodroma* Schiner
Wing normal .......................................................54

54. Arista terminal, thick and long pubescent on the basal fourth.

*Acrochaeta* Wiedemann

Arista terminal or dorsal, normal in shape and practically bare ......55

55. Lower lobe of the squamae with a strap-like prolongation near the outer
end .................................................................58
Lower lobe of squamae transverse apically ..............................56

† In a forthcoming contribution Mr. M. T. James will propose a new genus for *S. constans*,
*mutabilis*, etc.
Stratiomyidae VI.—78, Neochauna; 79, Stratiomyia mutabilis; 80, Chordonota carbonaria; 81, Cacosis nigra; 82, Actina viridis; 83, Rhingiopsis rostrata; 84, Oxyera albivittata; 85, Promeranisa nasuta; 86, Acanthomyia; 87, Chiromyza; 88, Pedicella lucens; 89, Chrysochroma nigricornis; 90, Euparyphus; 91, Chrysochloa.
56. Third vein with a branch near the end of the first vein. Aloipha Enderlein

57. Second antennal segment subtriangularly produced into the third on the inner side (15, 16, 39). Ptecticus Loew
Second antennal segment at most moderately convex on its inner end, never subtriangular (18, 63). Merosargus Loew

58. Ocellar triangle situated far from the vertex and almost or quite twice as long as wide (14, 88). Pedicella Bigot
Ocellar triangle not or but little longer than wide, in the female partly behind the upper angles of the eyes, in the male usually somewhat in front of this point. Chrysochroma Williston

59. Ocellar triangle in female lying almost all in front of the posterior angle of the eyes, the males without the eyes divided into definite zones of differently sized facets; anal cell much narrower than the combined basal cells (45, 89). Microchrysa Loew

Family Coenomyiidae

Flies of medium to large size, the antennae elongate, with the third segment annulate and more or less clearly subdivided.

Males holoptic or dichoptic. Antennae never with a distinctly differentiated style although the terminal annulus may resemble one to a certain extent. Empodium developed pulvilliform, the pulvilli present. Squamae small. Wing venation well developed, the discal cell always present, the fourth posterior cell sometimes closed.

As here defined this family includes insects of diverse structure but there seems to be no good character for their separation. The genus Coenomyia has been placed in various families, including the Rhagionidae, Tabanidae and Stratiomyidae. It appears, however, because of the facial structure, to be best placed between the two last mentioned families. Upon general structure alone Cocnonymia might well be isolated from the remainder of the other included genera except that Arthropeas magnus Johnson is very similar in appearance, differing only in having bare eyes and in lacking the scutellar spines.

The adults are found in woods, especially near moist places, while the larvae mostly occur in decaying wood, under the bark of trees or in the soil and are carnivorous and predaceous. The opinion has been expressed that the larvae of Coenomyia may live upon the immature stages of Cicadas. A revision of the North American species will be found in Leonard* "Revision of the Rhagionidae in the United States and Canada."

I might add that I cannot agree that the genus Solva Walker belongs to the Stratiomyidae although there is no doubt that there is some relationship. Both the facial shape and wing venation exclude it from that family.

KEY TO GENERA

1. Eyes bare ................................................................. 2
   Eyes pilose (9, 11) .................................................. Coenomyia Latreille
2. Anterior tibiae with one terminal spur .................................. 3
   Anterior tibiae without terminal spur ................................... 4
3. Antennae acute at the tip, the apical annulus elongate (1, 8)  
   Arthropeas Latreille
   Antennae obtuse at the tip, the apical annulus short and broad (3, 7).
   †Xylophagus Meigen
4. Fourth posterior cell open .............................................. 5
   Fourth posterior cell closed (5, 12) .................................. Solva Walker
5. Face with a very large, prominent pilose swelling on either side (2, 10) 
   Glutops Burgess
   Face not strongly swollen laterally, bare (4, 6) .................. Arthroceras Williston

FAMILY COENOMYIIDAE

Family Tabanidae—The Horse Flies

Chrysops species.

Bristleless flies of medium to large size, the eyes usually bi-colored in life.

Head large, the occiput flattened or concave. Eyes large, short pilose or bare, usually holoptic in the males and often with some of the facets much larger than the others; ocelli present or absent. Proboscis projecting, sometimes longer than the body; palpi with two segments, the second segment variable in different genera and sometimes in the two sexes. Antennae porrect, composed of three segments, the third composed of three to eight annuli. Thorax and abdomen clothed with fine hairs. Abdomen broad, composed of seven visible segments; genitalia never prominent. Legs moderately stout, the tibiae sometimes much dilated; middle tibiae always with two spurs at the tips; empodium developed pulvilliform, the pulvilli always present. Wings with two submarginal and five posterior cells; basal cells large; anal cell usually closed near the wing margin; costa extending around the entire wing. Squamae large.

The Tabanids are common in all parts of the world. They have been given various common names, such as Horse Flies, Deer Flies, Greenheads, Bullheads, etc. The adults of most species are serious pests of mammals and man is not excepted. One type of filariasis is transmitted by the adults and both the fly and host are essential in the life cycle of the parasite causing the disease. One of the best ways of collecting these insects is to capture those causing irritation during collecting trips. Since the larvae of many species are aquatic the adults may usually be found near water and in the ease of some species the males are rare except adjacent to the breeding places, and, as this sex does not suck blood they must be looked for in places other than in the vicinity of warm blooded animals, the same being true for most of the genera of the Pangoniinae, although the genus Chrysops of this
subfamily contains some of the most serious pests of man. The males of some species feed upon pollen and nectar and may be found upon most melliferous flowers, hovering over streams or pools or even along paths. The sexes are frequently very different in appearance and difficult to associate.

The transmittal of disease by Tabanids may be a purely mechanical operation or the flies may serve as intermediate hosts of the parasitic organisms causing disease. *Tularamia* is spread mechanically and is transmitted by *Chrysops discalis* Williston. Normally it is a disease of rodents (particularly rabbits) but man sometimes develops the disease after being bitten by the fly. It has also been demonstrated that *Anthrax* may be carried on the proboscis of Tabanids and cause infection as a result of the bite of the fly and various species of trypanosomes are transmitted. In Africa a filarial disease caused by *Loa loa* Cobbold, and known by that name, is transmitted by two species of *Chrysops*. The details have been worked out by A. and S. A. Connal (Trans. Roy. Soc. Trop. Med. Hyg., xv, pp. 131-134, 1913).

The eggs are laid, as a rule, in large masses on leaves and stems of plants overhanging water and are usually brown or black in color. They show characteristic generic arrangement and sometimes specific characters but too little is known about them to permit of their identification. The larvae are predaceous. Larvae have been found in rotten wood, under stones, in mud, etc. Pupation takes places near the surface of the soil. There are many papers dealing with the biology of North American Tabanidae, but most of them are quite short. Papers by Cameron* and Marchand† on the immature stages are the most comprehensive.

The number of species of Tabanidae is large, the genus *Tabanus* alone containing about 1200 described species. The first (and only) North American monograph of the family was published by Osten Sacken in 1875 and 1878. Since that time the number of species has greatly increased and the difficulty of identifying specimens is relatively greater. Hine has published on the Tabanidae of Ohio‡, while there are numerous short papers scattered through the literature.

Fascicle 175 of "Genera Insectorum", by Dr. J. Sureouf, deals with this family but the treatment has been rather unfavorably criticized by other workers in the field. Several American students are now studying the family and excellent revisions of the nearctic species may be expected to appear in the near future.

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‡ Hine, 1903, Ohio State University Bulletin, Ser. 7, No. 19.
KEY TO GENERA*

1. Hind tibiae with apical spurs, which may be quite small (Pangoniinae) 2
   Hind tibiae without apical spurs (Tabaninae) .......................... 15

2. Eyes with distinct pile .................................................. 3
   Eyes bare ................................................................. 9

3. First posterior cell open .................................................. 4
   First posterior cell closed ............................................. 5

4. Face not produced, at most slightly convex (Osca Walker) (22).
   Face much produced, snout-like ..................................... Neopangonia Ad. Lutz

5. Fourth posterior cell closed (15, 20) .................................. Scione Walker
   Fourth posterior cell open ............................................. 6

6. Third antennal segment furcate ........................................... 7
   Third antennal segment not branched .................................. 8

7. Third antennal segment branched, dorsally and ventrally (1).
   Third antennal segment branched only dorsally ..................... Elaphella Bezzi

8. Coxae and femora slightly hairy ....................................... Fidena Walker
   Coxae and femora densely covered with long pile (Erephopsis Rondani)
   (34, 35) ................................................................. Melpia Walker

9. First posterior cell closed; face merely convex, not snout-like; ocelli present; palpi long, sabre-shaped (25, 29)............ Esenbeckia Rondani
   First posterior cell open ............................................... 10

10. Third antennal segment composed of at least seven annuli ......... 11
    Third antennal segment composed of not more than five annuli; proboscis short ......................................................... 13

11. Posterior border of eye acutely angulate in female; proboscis very short; fork of third longitudinal vein without appendix; wings brownish in front, hyaline behind (1, 2, 3, 9) ............ Goniops Aldrich
    Eyes of female not acutely angulate above; wings not so marked .... 12

12. Proboscis but little longer than palpi; frons of female very wide below; fork of third longitudinal vein with appendix (5)........ Apatoletes Williston
    Proboscis much longer than palpi; frons of female narrow and almost parallel-sided (31, 33) ........................................ Buplex Austen

13. Second antennal segment only half as long as the first (16, 26).
    Silvius Meigen
    Second antennal segment much more than half as long as the first.... 14

14. Abdomen inflated, much wider than thorax; fork of third longitudinal vein with long appendix ........................................... Neochrysops Walton
    Abdomen normal, depressed, not much wider than thorax; fork of third longitudinal vein without appendix (10, 19) ............ Chrysops Meigen

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* Checked by Dr. J. Bequaert.
† Kräber, 1926, Stett. Ent. Zeitung, lxxxvii, pp. 211-353, two plates; and, Neotropical, 1925, Konowia, iv, pp. 210-375, five plates.
Tabanidae II.—14, Dichelacera analis; 15, Scione aurulans; 16, Silvius pollinosus; 17, Lepiselaga crassipes; 18, Diachlorus ferrugatus; 19, Chrysops meleena; 20, Scione aurulans; 21, Lepiselaga crassipes; 22, Scaptia; 23, Stibasoma theotenia panamensis; 24, Dichelacera analis; 25, Esenbeckia prasiniventris; 26, Silvius gigantulus; 27, Tabanus albocirculus.
15. Third antennal segment with four annuli; frons of female wide; fork of third longitudinal vein with appendix (7, 28). *Haematopota* Meigen
Third antennal segment usually with five annuli; when with less the frons of female is narrow and the fork of third longitudinal vein bears no appendix ........................................ 16

16. Third antennal segment not at all or barely angulated above......... 17
Third antennal segment with distinct angle or process near the base above; ocelli rudimentary or absent................................. 20

17. Ocelli present and of normal size; all tibiae not or hardly swollen.
*Merycomyia* Hine
Ocelli absent; at least fore tibiae swollen................................. 18

18. Fore tibiae swollen; mid and hind tibiae normal; palpi swollen at base, pointed at apex (8, 18). *Diachlorus* Osten Sacken
All tibiae swollen, the fore pair most; palpi flat and broad.............. 19

19. Third antennal segment broad and flat; subcallus divided by a median line .................................................. *Selasoma* Macquart
Third antennal segment narrow and slender; subcallus not divided medially (6, 17, 21) ....................................... *Lepiselaga* Macquart

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20. Dorsal process of third antennal segment unusually long, extending to third annulus ................................................................. 21
Dorsal process moderately long or forming a tooth, sharp edge, or weak angle ................................................................. 22

21. Fore tibiae strongly swollen; hind tibiae ciliate with long hairs (23, 30).
   Stibasoma Schiner
   Fore tibiae not or hardly swollen; hind tibiae not ciliate (14, 24).
   Dichelacera Macquart

22. Subcallus strongly swollen; first antennal segment much enlarged.... 23
Subcallus normal; first antennal segment not or slightly enlarged
   (11, 12, 27, 32).............................................................Tabanus Linnaeus

23. First antennal segment subgloabular as well from above as from the sides; all tibiae strongly swollen.......................Bolbodimyia Bigot
First antennal segment much produced downward (in side view), but not widened seen from above; tibiae not or hardly swollen (13).
   Snowiellus Hine
Family Pantophthalmidæ

Pantophthalmus sp., natural size.

Very large, usually broad, bristleless flies.

Eyes large, contiguous above the antennæ in the male; face rather short but often produced below into a distinct beak. Proboscis short, not adapted for piercing, with fleshy labellæ; palpi three-segmented, the basal segment short; ocelli present. Antennæ elongate, the third segment annulate and with a style-like apical section which may or may not be well differentiated. Squamae small. Wings with two submarginal and five posterior cells, the fourth posterior cell and the anal cell closed. Tibiæ without apical spurs; posterior femora usually with a strong spur on the under surface beyond the middle; empodia pad-like.

The three genera placed in this family are closely related and there has always been much doubt concerning the validity of Rhaphiorhynchus which is undoubtedly but poorly separated from Pantophthalmus (Acanthomera Wiedemann). The genus Ataphomyia Austen contains one species which is readily recognized by its slender, Mydas-like form. Austen* has revised the family but does not present keys to the species.

The Pantophthalmidae occur only in the American tropics. The larvae bore in solid wood (often in living trees) and the rasping sound made by them may be audible for a distance of several feet.

KEY TO GENERA

Pantophthalmus species.

1. Abdomen not or scarcely more than twice as long as wide, short and broad .......................................................... 2
   Abdomen three times as long as wide, long and narrow; Mydas-like species ........................................ Atopomyia Austen

2. Third palpal segment almost always cylindrical, even when somewhat swollen and more or less pointed below, usually obtuse apically; facial beak, if present and fairly long, strongly tapering and the ventral spur on the posterior femora greatly reduced or almost absent.
   Pantophthalmus Thunberg

   Third palpal segment broadened and laterally compressed, especially in the female, pointed below; face with a long, narrow beak and the posterior femora with a strong ventral spur.
   Rhaphiorhynchus Wiedemann
Family Rhagionidæ—The Snipe Flies

Small to medium sized, nearly bare or thinly pilose flies.

Face very strongly receding, the middle convex but lying much below the level of the eyes in profile; males holoptic or the eyes very narrowly separated. Antenna composed of three segments, the third bearing a terminal or dorsal arista or rather slender style. Scutellum unarmed. Legs long; empodium developed pulvilliform (but slightly developed in Hilarimorpha). Wing venation strong; four or five posterior cells, the discal cell absent only in Hilarimorpha. Abdomen long and usually tapering.

The Snipe Flies are common in woods, especially near moist places and may be found on foliage, in long grass and on tree trunks. They are predaceous in both the adult and larval stages. Leonard* has revised the Nearctic species.

There has been much confusion in regard to the limits of this family, those genera which I have placed in the Cœnomyiidæ being included by Williston. Hilarimorpha has been placed in the Empidæ, and Bombyliidæ but from its general structure I feel certain that it belongs here, despite the poorly developed empodium. The shape of the face excludes it from both families mentioned and the wing venation cannot be considered of prime importance.

KEY TO GENERA

1. Anterior tibiae without terminal spur.................. 4
   Anterior tibiae with one or two terminal spurs........ 2

2. Antennae with a long terminal arista or style which is very much longer than the antenna proper (1); alula present or absent... 3
   Antennae with a short, thick terminal style; alula present.

   Bolbomyia Læw

3. Alula present; scutellum haired; males holoptic (7, 14) (Triptotricha Læw) .................................................. Dialysis Walker
   Alula absent; scutellum bare; males dichoptic (1, 3) (Pheneus Walker).

   Vermileo Macquart

4. Discal cell present; five posterior cells.......................... 5
   Discal cell absent; four posterior cells (11).... ....Hilarimorpha Schiner

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Ragionidae II.—8, Atherix variegatus; 9, Ptiolina majuscula; 10, Rhagio incisus; 11, Hilarimorpha; 12, Symphoromyia; 13, Atherix variegatus; 14, Dialysis elongata; 15, Chrysopillus.
5. Third antennal segment round, oval or conical. ............... 7
   Third antennal segment kidney-shaped, with dorsal or subdorsal arista. 6

6. Posterior tibiae with two terminal spurs (8, 13) ....... Atherix Meigen
   Posterior tibiae with one terminal spur (4, 12) ... Symphoromyia Frauenfeld

7. Posterior tibiae with one terminal spur .......................... 8
   Posterior tibiae with two terminal spurs (2, 10) ... Rhagio Fabricius

8. Antennæ bearing a terminal style ............................... 9
   Antennæ with a long, slender terminal arista which is decidedly longer
   than the basal three segments combined (6, 15) ... *Chrysopilus Macquart

9. Style situated near the middle of the third antennal segment (5, 9).
   *Ptiolina Zetterstedt
   Style situated at the lower end of the third antennal segment.
   Spania Meigen.

Family Scenopinidae—The Window Flies

**Pseudatrichia longurio**, dorsal and lateral view, and *Scenopinus fenestralis* (right), dorsal view.

Flies of moderate or small size, usually blackish in color.

Front not excavated; face bare, short and broad; ocelli present; males usually holoptic; proboscis concealed; palpi cylindrical, bristly at the apex. Antennae approximated at the base, the basal two segments short, the third elongate, simple, without style or arista. Thorax rather long, moderately convex above, the head situated low on the thorax; scutellum broad and short, convex apically and unarmed. Abdomen flattened or cylindrical, composed of seven segments. Legs short; empodia absent. Wing venation simple, the third vein branched; apical cell open or closed: basal cells long, the first much longer than the second.

The adults, with the exception of *Scenopinus fenestralis* Linnaeus, are not common in collections. The larvae have been recorded as living in decaying fungi and wood and under carpets. *S. fenestralis* is sometimes common on windows and is said to live upon carpet beetle larvae, being predaceous. The common name of the family is derived from the window-frequenting habit.

Some authors have used the name *Omphvra* Meigen instead of *Scenopinus* Latreille, but I do not recognize Meigen's "1800" names. The family has been treated by Kröber in Genera Insectorum* and keys to the species are given.

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* Fascicle 161, 1914.
KEY TO GENERA

1. Antennæ longer than the width of the head (Brazil). Cerocatus Rondani
   Antennæ at most half as long as the width of the head. .......... 2

2. Apical cell closed and petiolate ........................................ 3
   Apical cell open (1, 2) .................................................. Scenopinus Latreille

3. Body with metallic scales (3, 4) ....................................... Metatrichia Coquillett
   Body without metallic scales (5) ................................. Pseudatrichia Osten Sacken

Scenopinidae.—1, 2. Scenopinus fenestratus; 3, 4. Metatrichia; 5. Pseudatrichia.
Family Mydaidæ—The Mydas Flies

Nemomydas pantherinus.

Large to very large, thinly haired or nearly bare, elongated flies. Venation complicated, the basal cells long, the fourth vein always ending at or before the tip of the wing. Antennæ composed of four segments, the fourth always elongate. Both sexes dichoptie, the front excavated between the eyes; ocelli, except the anterior one, absent. Proboscis with fleshy labellae, or rudimentary; palpi usually absent or extremely small, rarely long and slender. Empodia not developed pulvilliform.

The Mydas flies are easily recognized by the shape of the head, four-segmented antennæ and peculiar venation. The majority of the species are tropical in distribution and it is probable that the larvae of all live in decaying wood.

The generic limits in the family are but poorly understood and only an abundance of material will enable one to properly limit the genera. Johnson* has dealt with the Neartic forms, while papers by Bezzi† and Seguy‡ must receive attention in any attempt to deal with the family.

Mydiidae.
KEY TO GENERA

1. Posterior tibiae ending in a spur (5, 8) .................................................. 2
   Posterior tibiae without spur (6) .................................................. 5

2. Spur of the posterior tibiae longer than the width of the first tarsal segment, giving the tibia an arcuate appearance, the terminal bristle shorter than the spur; antennae (always?) similar in both sexes.... 3
   Spur small and straight, shorter than the tarsal thickness or the terminal bristle; antennae differing in the two sexes; palpi absent (1, 2, 3, 5, 7) .................................................. Phyllomydas Bigot

3. Palpi wholly absent or represented by a bulbous swelling (8, 10; see colored plate) .................................................. Mydas Fabricius
   Palpi well developed, slender and sometimes half as long as the proboscis .................................................. 4

4. Posterior femora rather strongly swollen; posterior trochanters without bristles (13) .................................................. Lampromydas Seguy
   Posterior femora not swollen; posterior trochanters bearing short, stout bristles (4, 12) .................................................. Opomydas, n. g.

5. No vein reaching the posterior border between the anal cell and tip of the wing .................................................. 6
   A vein (the fifth) extends to the wing margin (4, 12) .................................................. Opomydas, n. g.

6. Proboscis extending well beyond the oral opening (6, 11).
   Proboscis small, not extending beyond the oral opening (9).
   ‡Nemomydas, n. g.
   ‡Nomoneura Bezzi

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⁹ Lampromydas was based on specimens in which there is no vein extending to the wing margin between the anal vein and the tip of the wing but the character is not generic in this case. Of two specimens of (Mydas) luteipennis Loew, one has a vein in one wing while the other specimen has none. This species and maculiventris Westwood, as well as two unidentified species before me, belong to Lampromydas unless the genotype of Lampromydas lacks palpi.

† Ectyphus Gerstaecker is not known from North America but apparently occurs in South America. The three described North American species belong to Opomydas of which E. limbatus Williston is the genotype.

‡ leptomydas Gerstaecker is not known from America. The genus is distinguished by the hairy pleura, both the above genera having pile only on the pteropleura and supraspiracular convexities. The genotype of Nemomydas is Leptomydas pantherinus Gerstaecker.
Asilidae I.—1, Leptogaster; 2, Leptogaster, antenna; 3, Leptogaster, end of tarsus; 4, Damalis, antenna; 5, Dicranus, claw; 6, Scleropegon, antenna; 7, Microstylum galactoides; 8, Psilocerus, antenna; 9, Laphystia, antenna; 10, Ceratargus cruciatus; 11, Myelaphus melas; 12, Dioctria, antenna; 13, Blepharepium coareatum, claw; 14, Diogmites winthemia; 15, Diogmites, antenna; 16, Lestomyia fraudigera; 17, Taracticus, end of tibia; 18, Taracticus, antenna; 19, Buckellia, antenna; 20, Nicocles rufus; 21, Psendorus, tibial spur; 22, Atomosia puella; 23, Pogonoseoma dorsata; 24, Dasylechia atrox; 25, Bomgomima, antenna; 26, Laphria, Lampria; 27, Omnatius, antenna; 28, Eccritosia; 29, Mallophora, claw; 30, Promachus; 31, Promachus, claws; 32, Promachus, antenna.
Family Asilidae—The Assassin Flies

Species of moderate to large size, rarely small, usually rather elongate in form, often thickly hairy and always with bristles, entirely predaceous in habit.

Head flattened, broad and short, separated from the thorax by a neck (the prothorax) and freely movable. Front excavated above, usually broad in both sexes, rarely narrow. Ocelli present, usually situated upon a rounded tubercle; front with bristles. Antennae porrect, usually composed of three simple segments, the third more or less elongate and with or without a terminal style or arista, the latter very rarely pectinate, the style rarely strongly thickened and forming one or two additional segments. Probosces of moderate length, horny and adapted for piercing, directed downward or forward; labella never fleshy; palpi composed of two segments, the basal one often small and not freely articulated with the second. Thorax variable in shape, convex, usually bearing bristles. Abdomen composed of eight segments, the hypopygium and ovipositor usually prominent. Legs strong, usually bristly, of moderate length, the femora often, the posterior tibiae sometimes thickened, the legs sometimes very long and rather slender; empodium present or absent; the puvilli rarely absent or greatly reduced. Wings lying parallel over the abdomen when at rest; basal cells long; two or three submarginal cells, five posterior cells (four in a very few genera); first and fourth posterior cells and the anal cell either open or closed.

The members of this family have usually been termed "Robber Flies" but I adopt "Assassin Flies" as much more suitable as a common name. All the Asilidae are predaceous in the adult and probably in the larval stages. The adults are found everywhere but many groups of genera are restricted in habitat. Some will be found in clearings in and around the edges of woods, some on sand near water, others in open fields or on fallen trees or fenceposts. Some of the species are found almost entirely on tree trunks while others sit on the tips of dead branches of trees or the tops of dead weeds. The species of Leptogaster prefer long grass, particularly in moist places. Sandy beaches will usually yield a few species. The species of Laphria and Bombomina will usually be found resting upon leaves in the sun in or at the edges of woods while the genera related to Asilus mostly frequent open fields.
Asilidæ II.—31, Psilocerus caudatus; 35, Leptopteronia gracilis (Brazil); 36, Holcocephala, head from in front. 37, Scleropogon turqui; 38, Archilestris magnificus; 39, Chrysoceria picitarsis; 40, Dizonias; 41, Pseudorus bicolor; 42, Atonia mikii; 43, Atomosia macquartii, antenna; 44, Cerotainia, antenna; 45, Lampria, hind leg; 46, Andrenosoma.
Many of the Asilids resemble bees and are quite powerful. They devour insects of all kinds, catching them during flight, and bees form the principal article of diet of some species although the variety of food is usually limited only by the intended victim's ability to escape. The prey is pierced by the powerful proboscis and the juices sucked out, the digestion taking place by the injection into the victim of a powerful "enzyme" which breaks down the muscular tissue. The collector should be careful in handling the larger species as they not infrequently bite, resulting in a painful, if not serious, wound.

The family is a large and popular one and includes many fine species. For the most part the classification is simple but in some genera it is difficult to separate the species by means of the available literature. There has been no monograph of the Nearectic species although Back* has dealt with about half the family. However, since the appearance of his contribution many additional species have been described.† Otherwise the literature is scattered although not difficult to obtain.

In the key will be found many references to keys to species which should prove very helpful in tracing out the species. I have not followed the practice of recognizing subfamilies as the characters previously used obviously separate related genera and some genera are difficult to place where the system is followed. For Cuban species see Bromley "The Asilidae of Cuba." (Ann. Ent. Soc. Amer., xxii, pp. 272-294); also Texas Asilidae by the same author.‡

KEY TO GENERA

1. Anterior tibiae with a terminal, sharply curved, ventral spur........... 2
   Anterior tibiae with only straight or gently curving apical bristles..... 17

2. Marginal cell closed and petiolate (121) ..................................... 3
   Marginal cell open ........................................................................... 4

3. Face bare except for a very few hairs on the oral margin (121, 122).
   (Doryclus Jaenicke
   Face with strong hairs and many on the oral margin (21, 41).
   (Pseudorus Walker

4. Middle of mesonotum raised and bearing a crest of long, dense hairs
   (50, 86)..........................................................................................‡Comantella Curran
   Mesonotum never with crest of dense hair................................. 5

5. Antennae with distinct, two-segmented apical style....................... 13
   Antennae either with a short, broad, one-segmented style bearing a
   spine in the depression, without style, or excised and bearing a spine
   above ................................................................. 6

* 1909, Tr. Amer. Ent. Soc., xxxv, pp. 137-400, plates II-XII.
Asilidae III.—47, Pilica sp. (Panama); 48, Atomesia tibialis, head from in front; 49, Neopogon; 50, Comantella fallei; 51, Cerdistus dolichomerus; 52, Callinicus calanus; 53, Senoprosopis (Panama); 54, Hodophylax aridas; 55, Panamasitus xyloza; 56, Plesioma; 57, Heteropogon macerinus; 58, Lastaurus.
6. Third antennal segment with an apical depression or style in which is inserted a small short spine ........................................ 8
   Third antennal segment excised above beyond the middle and bearing a short spine .................................................. 7

7. Pulvilli present and large (17, 18, 71, 112) .................. Taracticus Løw
   Pulvilli absent .......................................................... Parataracticus Cole

8. Posterior pulvilli not more than one-third as long as the claws, (13, 96, 123) ........ Blepharepium Rondani
   Posterior pulvilli more than half as long as the claws ............. 9

9. Abdomen thickly pilose, at least laterally ................................ 10
   Abdomen almost bare .................................................. 11

10. Face convex, pilose on lower two-thirds (Brazil) ........... Lastaurina, n. g.
    Face flat above, pilose on less than lower half (58, 95). Lastaurus Løw

11. Fourth posterior cell closed and petiolate at apex ...................... 12
    Fourth posterior cell open or closed in the wing margin (88, 102).

12. Abdomen clavate; scutellum without bristles (138, 153)
    Abdomen not clavate; scutellum with bristles (14, 15, 150).

13. Face gibbous in the middle, leaving a flattened space immediately below the antennae (16, 91) ........ Lestomyia Williston
    Face evenly convex or prominent below ...................... 14

14. The dense mystax occupies the lower half of the face (81, 87).
    The dense mystax is limited to the lowest fourth .................. 15

15. Scutellum without bristles or hair .......................... Cophura Osten Sacken
    Scutellum with bristles or hair .................................. 16

16. Scutellum with fine hair on the disc (20, 97) .......... Nicocles Jænnicke
    Scutellum with bristles only (19, 83, 98) ................... Buckellia Curran

17. Marginal cell open or closed in the costa ............... 18
    Marginal cell closed and petiolate .......................... 59

18. Pulvilli vestigial or wanting ..................................... 19
    Pulvilli normal, the posterior pair sometimes shortened ........ 25

19. Third antennal segment with a terminal arista or arista-like style, very slender species .......................... 22
    Third antennal segment with or without terminal style, if stylate the abdomen robust .................. 20

20. Claws very long and with an elongated tooth at the base of each claw (5) .................. Dicranus Løw
    Claws normal ....................................................... 21

Asilidae IV.—59, Neoitamus flavofemoratus; 60, Ommatus; 61, Lampria mexicana; 62, Pogonosoma melanoptera; 63, Mallophorina clausicella; 64, Negabilis belli; 65, Proctacanthus micans; 66, Atractia dispar; 67, Mallophora oricina; 68, Pachychepta copulata; 69, Machimus occidentalis; 70, Erax (Panama); 71, Taracticus octopunctatus.
21. Face wholly thickly pilose .......................... Ablautus Lcéw
   Mystax limited to the lowest fourth of the face, the face sparsely
   haired above (54, 100) ................................ Hodophylax James
22. Anal cell absent, the wings extremely narrow at the base (140).
   Anal, cell present .................................... 23
23. Mesonotum without dorsocentrals in front of the middle........... 24
   Mesonotum with a pair of dorsocentrals in front of the middle.
   Schildia Aldrich
24. Empodia entirely absent (117) .......................... Psilonyx Aldrich
   Empodia present, about half as long as the claws (1, 2, 3, 148, 149).
25. Antennæ with a slender terminal arista (4, 89) ...................... *Damalis Fabricius
   Antennæ with or without a terminal style ................................ 26
26. Only four posterior cells (93) ................................ Townsendia Williston
   Five posterior cells ..................................... 27
27. Head slightly higher than broad; face narrow above, swollen and
   broadened below ........................................... 28
   Head obviously broader than high ................................ 30
28. Antennæ with a terminal style ................................ 29
   Antennæ without visible style; fourth posterior cell closed before the
   border of the wing (118) .................................... Ospriocerus Lcéw
29. Metapleura bare (6, 37, 130) ................................ †Stenopogon Lcéw
   Metapleura with hair or bristles (6, 37, 130) .......................... †Scleropogon Lcéw
30. Antennæ apparently five segmented, the segments of the style simu-
   lating antennal segments ..................................... 31
   Antennal style usually strongly differentiated from the third antennal
   segment, absent, or the fifth segment longer than the second ........... 33
31. Third and fourth antennal segments very deeply emarginate apically
   (11) ......................................................... Myelaphus Bigot
   Third and fourth segments not concave apically .......................... 32
32. Fifth antennal segment not longer than the second (103).
   Ceraturgopsis Johnson
   Fifth antennal segment about as long as the third (10, 132).
   Ceraturgus Wiedemann
33. Fourth posterior cell closed .................................. 34
   Fourth posterior cell open, rarely almost closed ....................... 40
34. Face haired above the mystax .................................. 36
   Face bare except along the oral margin ................................ 35
35. Metanotal callosities bare (38, 136) ........................... Archilestris Lcéw
   Metanotal callosities with hair or short bristles (7, 101)
   Microstylum Macquart
36. First posterior cell closed and long petiolate (109) .............. Trielis Lcéw
   First posterior cell open or closed in the wing margin ............... 37

Asilidae V.—72, Eumecosoma shropshirei; 73, Laphystia sexfasciata; 74, Dioctria baumhaueri; 75, Dicolonus simplex; 76, Metapogon; 77, Cerotainia propinqua; 78, Holopogon guttula; 79, Psilocerus birdi; 80, Bombomima flavicollis; 81, Aphantartania; 82, Bathropsis basalis; 83, Buckellia stylosa; 84, Laisopogon opaculus; 85, Echthodopa.
37. Antennae without distinct style .............................................. 38
Antennae with the style short and broad, two-segmented, easily distinguisable (9, 73, 92) .............................................. *Laphystia Læw

38. Anterior femora on the basal half of the under side with a large patch of dense, very short bristles .............................................. Sphageus Læw
Anterior femora without such bristles .............................................. 39

39. Third antennal segment very much longer than the basal two combined (40, 124) ......................................................... *Dizoniae Læw
Third antennal segment not or scarcely longer than the basal two combined, elongate oval, swollen (8, 31, 79) .......... *Psilocerus Læw

40. Antennal style as broad as the third antennal segment and simulating a segment, sometimes closely appressed and not easily differentiated. 41
Antennal style narrower than the third segment or absent .............. 44

41. Lateral slopes of the metanotum bare ...................................... 42
Lateral slopes of the metanotum with pile (75, 91) .................. Dicolonus Læw

42. Face bare except below ......................................................... 43
Face haired between mystax and antennæ (103) .......... Ceraturgopsis Johnson

43. Posterior femora with very short, stout bristles below on the apical half (85) ......................................................... Ecthopoda Læw
Posterior femora without short, stout bristles below, but with short, erect pile on the whole length (12, 74, 90) .......... †Dioctria Meigen

44. Front narrowed posteriorly ..................................................... 45
Front not narrowed posteriorly ..................................................... 46

45. Ocelli situated far forward on the front (56, 133) .......... Plesioma Macquart
Ocelli situated near the vertex .................................................. Dolichodes Macquart

46. Face bare except on the oral margin (cf. Holcocephala) .......... 47
Face with hair between the mystax and antennæ, or evenly haired .... 49

47. Third antennal segment swollen, about twice as wide as the second.
Willistonia Back
Third antennal segment elongate, more or less tapering from the base or only slightly wider than the second .............................. 48

48. Third antennal segment elongate, longer than the basal two combined (49) ......................................................... Neopogon Bezzi
Third antennal segment oval, not as long as the basal two combined.
Lissoteles Bezzi

49. Head very wide, the face with a deep, transverse groove above the oral margin and with only two to six hairs above the mystax (36, 141).
Holcocephala Jaenricke
Head narrower, the face without the transverse depression .......... 50

50. Mesonotum with the dorsocentral bristles strong and extending in front of the suture, if rather weak anteriorly there are no acrostical hairs .......................................................................................................................... 51
Dorsocentrals absent or not strongly differentiated; mesonotum hairy; the acrostical hair always present .............................................. 52

† Melander, 1923, Psyche, xxx, p. 212.
Asilidae VI.—86, Comantella fallei; 87, Aphamartania murina; 88, Saropogon intensus; 89, Damalis; 90, Dioctria baumbaueri; 91, Dicolonus simplex; 92, Lephystia sexfasciata; 93, Townsendia argyrata; 94, Leptomyia sabulonum; 95, Lastaurus; 96, Blephareplum secabilis; 97, Nicoles politus; 98, Buckelia pollinosa; 99, Lasiopogon tetragrammus; 100, Hodophylax aridus; 101, Microstylum galactoides; 102, Saropogon birdi; 103, Ceraturgopsis cornutus.
51. No acrostical hairs (76, 112)........................... *Metapogon* Coquillett
   Acrostical hairs present, usually abundant but short (81, 99).
   †Lasiopogon Lœw

52. Mesonotum with the hair appressed and usually with distinct, sub-
   appressed dorsocentral bristles posteriorly........................... 53
   Mesonotal hair erect, the bristles, if present, very fine and erect........ 56

53. No trace of dorsocentral bristles (type *Lasiopogon terricola* Johnson)
   (81, 99) .................................................. Alexiopogon, n. g.
   Distinct, though weak dorsocentrals posteriorly........................ 54

54. Abdomen elongate, more or less narrowed basally in the males........ 55
   Abdomen short and broad, rather strongly tapering in both sexes; hair
   rather abundant but short...................................... Pycnopogon Lœw

55. Disc of scutellum with hairs toward either side (52, 126). Callinicus Lœw
   Scutellum with marginal bristles and hairs only (39).
   Chrysoceria Williston

56. Face decidedly gibbous, the swelling clearly limited above........... 57
   Face flat or evenly, gently convex.................................. 58

57. The third vein branches before the apex of the discal cell; style long
   (129, 151)........................................................................... §Eucyrtopogon Curran
   The third vein branches conspicuously beyond the apex of the discal
   cell; style short (128, 152).............................................. §Cyrtopogon Lœw

58. Posterior tibiae strongly swollen, about twice as large as the anterior
   ones (78, 143)...................................................................... Holopogon Lœw
   Posterior tibiae not enlarged (57, 127).................................... Heteropogon Lœw

59. Antenna with a terminal arista............................................. 77
   Antennæ with or without a terminal style which is never bristle-like.. 60

60. Wing with only two submarginal cells..................................... 61
   Wing with three submarginal cells (23, 62).............................. Pogonosoma Rondani

61. Third antennal segment with an apical style, which is rarely difficult
   to discern ................................................................. 62
   Third antennal segment without style...................................... 66

62. Third antennal segment excised and bearing a very short bristle be-
   yond the middle on the upper side, the style slender (66, 108).
   Atractia Macquart
   Third antennal segment not excised above.................................. 63

63. Face with strong, isolated bristles and short, fine hair............... 65
   Face with soft hair, which may be long and contain some coarse ones.. 64

64. Face perpendicular, more prominent above or almost evenly convex;
    mesonotum not with dense, long yellow pile (9, 73, 92).
   †Laphystia Lœw
   Face most prominent below the middle, strongly convex; mesonotum
   with dense, long yellow pile (24).................................... Dasylechia Williston

‡ Curran, 1925, Can. Ent. Iv, p. 95.
FAMILY ASILIDÆ—THE ASSASSIN FLIES

65. First antennal segment less than twice as long as the second; style strongly differentiated (12, 110) .................. Atonia Williston
First antennal segment more than three times as long as the second; style poorly differentiated (82, 145) .................. Bathropsis Hermann

66. Third antennal segment at least three times as long as the basal two combined ........................................... Aphestia Schiner
Third antennal segment not more than twice as long as the first two combined ........................................... 67

67. Metanotal slopes or callosities bearing pile or short, stout bristles... 68
Metanotal callosities without pile or bristles.......................... 73

68. Mesonotum evenly clothed with dense pile, most of which is yellow, some erect and some appressed; no bare areas outside the dorso-central area; large species (25, 80) .................. *Bombomima* Enderlein
Mesonotum without dense hair concealing the ground color....... 69

69. Front at least slightly widening above, never narrowed......... 70
Front narrowed above (22, 43, 48) .......................... † Atomosia Macquart

70. First antennal segment at least three times as long as the second... 71
First antennal segment not twice as long as the second........... 72

71. Seventh abdominal segment elongate (107) ........... Protichisma Hermann
Seventh abdominal segment short, three or four times as wide as long, or apparently absent (44, 77, 116) .................. ‡ Cerotainia Schiner

72. Face strongly gibbous below and with rather abundant hair above (47) ............................................... Pilica Curran
Face weakly gibbous below and with only a row of hairs on either side (72, 114) ........................................... ‡ Eumecosoma Schiner

73. Face with a strong swelling occupying the lower half, most prominent in the middle .............................................. 75
Face very gently convex or concave and most prominent just above the oral margin ........................................... 74

74. Scutellum with long marginal bristles; large, elongate species (55).
Panamasilus Curran
Scutellum with extremely short, upturned marginal hair; smaller, robust species (135) .................. Cerotainiops Curran

75. Proboscis laterally compressed .................................. 76
Proboscis dorsoventrally compressed (46) .......................... ‡ Andrenosoma Rondani

76. Metasternum with long hairs (26, 45, 61) .................. Lampria Macquart
Metasternum bare (26) ........................................... † Laphria Meigen

77. Arista pectinate below (27, 60) .......................... o Ommatius Wiedemann
Arista not pectinate ........................................... 78

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* This name replaces Dasyllis, a strictly South American genus. Unless the presence of metanotal hairs is a valid character the genus does not differ from Laphria. For key see Banks, 1917 (Dasyllis) Bull. Brooklyn Ent. Soc., xii, p. 52.
‖ McAtee, 1918, Ohio Journ. Sci., xix, p. 143.
Asilidae VIII.—122. Doryclus (n. sp.) ; 123. Blepharepium secalis ; 124. Dizonias lucasi ;
125. Eras anomalous; 126. Callinicus calanus; 127. Heteropogon sp. (Utah); 128. Cytopogon curtistylus; 129. Eucyrtopogon; 130. Scleropogon; 131. Neopogon; 132. Ceraturgus nigripes;
133. Plesioma lineata; 134. Promachina nims; 135. Cercrivipus; 136. Archilestris magnificus;
137. Senoprosopis; 138. Senobasis mendax; 139. Proctacanthus micans.
78. Third antennal segment long, with a bristle-bearing excision above (66, 108). ........................................... Atractia Macquart
Third antennal segment usually short, never with a bristle-bearing concavity above ........................................... 79

79. Slopes or lateral swellings of the metanotum pilose.................. 92
Slopes or lateral swellings of the metanotum bare....................... 80

80. Third antennal segment very long and narrow, tapering, with a short, thick arista; face very narrow (53, 137)....... Senoprosopis Macquart
Third antennal segment short, with long arista; face not unusually narrow ........................................... 81

81. Claws acute apically .................................................. 84
Claws obtuse apically, thick almost to the apex.......................... 82

82. Front and face wide; space between antennae and posterior ocelli strongly transverse ................................. 83
Front and face narrow; space between the antennae and posterior ocelli as great as the width or practically so (134)..... Promachina Bromley

83. Face evenly, gently convex, evenly pilose, the oral margin with bristles (63, 103)........................................... *Mallophoria, n. g.
Face more or less strongly gibbous below, not uniformly pilose (29, 67).
†Mallophora Macquart

84. Third antennal segment strikingly haired above...... Anarmostus Læw
Third antennal segment bare or with only a few short hairs above...... 85

85. Three submarginal cells ................................................. 86
Two submarginal cells ....................................................... 87

86. The crossvein separating the second and third submarginal cells is situated well beyond the apex of the discal cell (30, 31, 32). Promachus Læw
This crossvein is situated well before the apex of the discal cell (70, 125)
‡Erax Scopoli

87. The posterior branch of the third vein meets the costa before the apex of the wing ........................................... 88
The posterior branch of the third vein reaches the wing margin behind the apex of the wing........................................... 90

88. The ♀ ovipositor ends in a circlet of spines; abdomen of males longer than the wings (65, 139)......................... Proctacanthis Macquart
The ♀ ovipositor is laterally compressed or bears many short spines above; wings reaching beyond the tip of the abdomen in males.... 89

89. Female ovipositor with many short, stout spines above; upper ocelli situated on the front slopes of the ocellar swelling (28, 111). Eccritosia Schiner
Female ovipositor laterally compressed; upper ocelli on the top of the ocellar swelling (70, 125).............................. ‡Erax Scopoli

Asillidae IX.—140, Eurhabdus zephyrea; 141, Holcocephala calva; 142 Taracticus octopunctatus; 143, Holopogon guttula; 114, Eumecosoma gibbus; 145, Bathropsis basalis; 146, Cerotainia propinqua; 147, Psilonyx, front tarsal claws; 148, Leptogaster, front tarsal claws; 149, Leptogaster; 150, Deromyia litoralis; 151, Eucyrtopogon varipennis; 152, Cyrtopogon willistoni; 153 Senobasis analis.
90. Face with a strong gibbosity occupying the lower half or more (70, 125)..............................*Erax Scopoli
Face only weakly gibbous............................... 91

91. Mystax dense, extending to above the middle of the face (104, 115, 117).
   Proctacanthella Bromley
Mystax sparse, composed of bristles (68)..............Pachycheleta Bigot

92. Abdomen without bristles ............................................. 93

93. Facial gibbosity shining black................................. Rhadiurgus Loew
Facial gibbosity pollinose, weakly developed............... 94

94. Scutellum with at least two bristles.......................... 95
   Scutellum without bristles (61, 106)......................Negasilus, n. g.

95. Mystax composed of bristles only (116)....................†Asilus Linnaeus
Mystax composed mostly of very fine hair.............Antiphrisson Loew

96. Occipital cilia abundant, rather long and curved at almost right angle
   at or near the apical third (59).......................†Neoitamus Osten Sacken
Occipital cilia shorter and stouter, not strongly curved........ 97

97. Facial gibbosity strongly developed and reaching at least to slightly
   above the middle of the face (Tolmerus Loew) (69)....†Machimus Loew
Facial gibbosity weakly developed, not extending above the lower third
   of the face .......................................................... 98

98. Dorsocentraals extending in front of the suture (51).......†Cerdistus Loew
Dorsocentraals not extending in front of the suture.......... 99

99. Female ovipositor armed at the apex with four or six stout, short
   bristles; forceps of male genitalia strongly curved and leaving a
   large open space on the apical half (114, 120)............†Philonicus Loew
Female ovipositor without bristles; male genitalia compact, never
   leaving a large open space from dorsal view (113, 119).
   †Heligmonoeura Bigot

Alexiopogon, new genus

Distinguished from Lasiopogon Loew by the absence of dorsocentral
bristles. The figures of Lasiopogon will serve also for this genus. Genotype:—Lasiopogon terricola Johnson.

Mallophorina, new genus

Claws robust, obtuse apically; marginal cell closed and petiolate,
the first posterior cell open or closed; antennae with long, terminal arista-
like style; face evenly gently convex or almost flat, and with almost uni-
form hair; front and face wide; body rather thickly pilose. Genotype,

—Mallophora guildiana Williston. Species included: laphroides Wiedemann, clausicella Macquart, acra Curran, all previously placed in Mallophora.

Negasilus, new genus

Related to Asilus Linnaeus but at once distinguished by the absence of scutellar bristles. Artista short and style-like; face moderately convex on the lower half, the mystax composed of bristles only; occipital bristles straight; four pairs of dorsoceentrals on the posterior half of the mesonotum; mesonotal hair all short and appressed; abdomen elongate and without bristles on the second and following segments. Genotype:—N. beli, n. sp.

N. beli is black, cinerous-yellowish pollinose, the male genitalia, apices of the femora and the tibiae reddish.
Family Therevidae—The Stilleto Flies

Thereva species.

Flies of moderate size, more or less bristly and often pilose, with predaceous habits.

Front not excavated, the eyes of the males usually holoptic or nearly so; proboscis projecting, the labellæ broad; palpi two-segmented; ocelli present. Antennæ with three segments and usually a sharp terminal style. Abdomen elongate, the genitalia small but exposed, the ovipositor with a circlet of spines. Legs with bristles; empodia absent; pulvilli usually present. Third vein furcate; five posterior cells, the fourth sometimes closed; anal cell closed toward the margin of the wing or narrowly open.

The adults are found in various places but are most abundant in dry areas, such as meadows, pastures and along sandy beaches. They often occur in considerable numbers in burnt-over areas and are always most abundant during hot weather. Cole* has revised the family and given keys to the North American species. A number of species have been described during recent years but most of the species will be found in Cole's paper.

The larvae are not well known but are all believed to be predaceous and they may prove to be of considerable importance in the control of certain insects.

Therevidae II.—10, 11, 12, Pherocera signatipennis; 13, 14, Henicomyia hubbardi; 15, 16, Nebrius pellucidus; 17, Nebrius pellucidus, ♀ genitalia.
KEY TO GENERA

1. Body largely clothed with scales (4, 5) .................. Chromolepida Cole
   Body with tomentum but never with irridescent scales ............. 2

2. Third antennal segment appearing annulated; labrum narrow (Mexico).
   Ozodiceromyia Bigot
   Third antennal segment not annulated, usually with a terminal style
   or short spine .................................................. 3

3. First antennal segment longer than the head and bristled (Mexico;  
   cf. Metaphragma Coq.) .................................. Euphycus Kröber
   First antennal segment rarely as long as the head ................ 4

4. Five posterior cells ........................................ 5
   Four posterior cells (Bombyliidae) ........................... Canotus Cole

5. Parafacials bare ............................................ 8
   Parafacials with pile ........................................ 6

6. Basal antennal segment long and greatly swollen, much larger than  
   the second and third combined (1, 7) ....................... *Tabuda Walker
   Basal antennal segment not unusually large, never greatly swollen.. 7

7. Third and fourth veins connected by a crossvein beyond the furcation  
   of the third vein (6) ........................................ Metaphragma Coquillett
   Wings without such crossvein (8) ........................... Thereva Zetterstedt

8. Third antennal segment not more than twice as long as the first.... 9
   Third antennal segment at least two and a half times as long as the  
   first (Southern) (13, 14) ................................. Henicomyia Coquillett

   Basal antennal segment pollinose ................................ 10

10. Basal antennal segment swollen and hairy (1) ................... 11
    Basal antennal segment not strongly swollen ..................... 12

11. Males dichoptic; lower front pilose (1, 7) ................... *Tabuda Walker
    Males holoptic or nearly so; lower front bare of pile .. Dialineura Rondani

12. Intercallary and fifth veins reaching the wing margin .......... 13
    Intercallary and fifth veins not reaching the wing margin (10, 11, 12).
    Pherocera Cole

13. Antennal style projecting from under the tip or from the apex of the  
    third segment ............................................... 14
    Style arising from a hollow near the apex of the third segment (9).
    Epomyia Cole

14. Antennal style projecting from under the tip of the third segment.
    Furcifera Kröber
    Antennal style apical (2, 3) ...................... Psilocephala Zetterstedt

* Tabuda fulvipes Walker, 1852, is a synonym of Thereva nervosa Walker, 1848. The latter becomes the genotype.
Family Apioceridae

Apiocera species.

Large, elongate flies, with three-segmented antennae and rather thinly pilose.

Antennae with or without a short, terminal style. Front not excavated, wider in the female; ocelli present; face short; proboscis longer than the length of the head, not adapted for piercing, the labella not horny. Empodia wanting. Third vein usually furcate; basal cells long; five posterior cells, the fourth closed. Male forceps enlarged.

These flies are apparently restricted to arid or semi-arid regions and are not at all common in collections. Like the Nemestrids they are great hoverers and make a loud noise while in flight. The immature stages are unknown.
KEY TO GENERA

1. Proboscis more than twice as long as the head-height ............... 2
   Proboscis not longer than the head-height (1, 2) ... *Apiocera Westwood.

2. Anal cell closed before the wing margin (3, 4).
   Anal cell open.............................................. Apomidas Coquillett


Apioceridae.—1, 2, Apiocera haruspex; 3, 4, Rhaphiomydas acton.
Family Bombyliidae—The Bee Flies

Small to moderately large flies, often with pictured wings and frequently clothed with abundant, delicate hairs or scales which are easily abraded, rarely with conspicuous bristles.

Head narrower than or as broad as the thorax, more or less hemispherical in shape; usually closely applied to the thorax. Face variable, usually short, often prominent below. Eyes large, often contiguous in the male, rarely so in the female. Antennæ three-segmented, porrect, rarely long; usually of moderate length, sometimes small; third segment simple; style usually small, never more than two-segmented, sometimes absent. Ocelli present. Probosces sometimes short and with broad labella, usually more or less elongate and projecting from the oral cavity. Thorax convex above, sometimes strongly so, usually with bristles. Abdomen composed of six to eight segments, slender in a few genera, usually depressed but often cylindrical and more or less tapering. Legs moderately long and weak, usually with short, weak bristles or spines; pulvilli sometimes rudimentary, the empodia usually absent. Squamae small. Wings often pictured; two to four submarginal cells (rarely with only one) discal cell almost always present (absent in some genera occurring outside North America); anal cell closed or narrowly open.

The family comprises almost two thousand described species and occurs throughout the world, being most abundantly represented in the tropical and subtropical regions. They are found particularly in warm spots, a relatively small number occurring in woods, and I have taken none in heavy shade. They like the warmest time of the day and most of them rest upon the dry soil, dried grass or upon grass in sandy places when not visiting flowers. Some species are found mostly at bloom, others but rarely. They are (mostly) great hoverers and generally very rapid fliers although they frequently fly but a short distance when disturbed. In the tropics I found many species in sunny places near the trees at the edge of the beach and along the trails in the forest, and similar places are productive in the north. Many of the species buzz persistently when captured.

Taxonomically the family is (in North America) in almost hopeless condition, the literature being extremely scattered. Only a few of the described species have been properly figured and without illustrations and usable keys the student is greatly handicapped. In addition to this unfortunate state of affairs the flies themselves present an obstacle, as the hairs are easily abraded and great care must be exercised in collecting them. Only a very few specimens should be placed
Bombyliidae 1.—1, Genus incertae; 2, Hyperalonia; 3, Litorhynchus; 4, Exoprosopa, hind claw; 5, Anthrax, antenna; 6, Villa, antenna; 7, 8, Exoprosopa, antenna; 9, Bombylus major; 10, Pantarhes; 11, Pantarhes, antenna; 12, Systoechus; 13, Lordotus; 14, Lordotus, antenna; 15, Phthiria; 16, Phthiria, antenna; 17, Sparnopolius, antenna; 18, Geron; 19, 20, Geron, antenna; 21, Toxophora; 22, Toxophora, antenna; 23, Systropus; 24, Systropus, antenna; 25, Mythicomyia, wing; 26, Mythicomyia, antenna.
in the killing bottle and they must never be placed with other insects else they be ruined for all practical purposes. Without the hairs they are of no value and cannot be properly identified.

The larvae are parasitic upon bees, wasps, grasshoppers and certain Lepidoptera, but not a great deal is known about most of the genera.

**KEY TO GENERA**

1. The second vein arises transversely opposite or almost opposite the anterior crossvein .......................................................... 2
   The second vein arises at an angle at a considerable distance from the anterior crossvein .................................................. 19

2. Antennal style separated from the third segment by a distinct suture, sometimes short ................................................. 3
   Antennal style not separated from the third segment .................. 7

3. Antennal style terminating in a pencil of hairs (5, 54, 64).
   *Anthrax* Scopoli
   Antennal style not terminating in a pencil of hairs.................. 4

4. Pulvilli vestigial or absent.................................................. 5
   Pulvilli large (49, 52)...................................................... *Aldrichia* Coquillett

5. Four submarginal cells (2).................................................. *Hyperalonia* Rondani
   Three submarginal cells.................................................. 6

6. Proboscis projecting more than the length of the labelle beyond the anterior oral margin (3)........................................... †*Litorhynchus* Macquart
   Proboscis projecting less than the length of the labelle (4, 7, 8, 57).
   †*Exoprosopa* Macquart

7. Anal cell open; eyes of ♀ not contiguous................................ 8
   Anal cell closed; eyes of ♀ contiguous at the vertex.
   *Astrophanes* Osten Sacken

8. Anal cell widest at the middle.......................................... 9
   Anal cell widest at the wing margin (36).............................. *Mancia* Coquillett

9. Second vein strongly contorted and - shaped at the apex........ 10
   Second vein not strongly contorted.................................. 11

10. Three submarginal cells ................................................ *Dipalta* Osten Sacken
    Two submarginal cells.................................................. *Neodiplocampta*, n. g.

11. Two submarginal cells ................................................... 13
    Three submarginal cells................................................ 12

12. Proboscis extending but little beyond the oral opening (6)..... *Villa* Lioc
    Proboscis extending far beyond the anterior oral margin (34, 51).
    *Stonyx* Osten Sacken

13. Face wholly without scales; labelle long and narrow.
    *Poecilanthrax* Osten Sacken
    Face with scales.................................................................. 14

14. Anterior tibiae with spicules in regular rows........................ 16
    Anterior tibiae with at most two or three very small spicules...... 15

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Curran, 1927, Can. Ent. lix, p. 84 (partial key).
15. Face acute, strongly projecting...............Chrysanthrax Osten Sacken
   Face not strongly projecting, the oral margin rounded (28).
   Thyridanthrax Osten Sacken
16. Proboscis projecting far beyond the anterior oral margin.............. 17
   Proboscis projecting but little beyond the oral margin................ 18
17. Abdomen with broad scales on basal half (27).
   *Lepidanthrax Osten Sacken
Abdomen without broad scales on basal half.......Rhynchanthrax Painter
18. Face conical, acute at oral margin........................Paravilla Painter
   Face obtuse below, the oral margin rounded.......................Villa Liy
19. With four posterior cells........................................... 24
   With only three posterior cells................................... 20
20. Slender, elongate species, with long, slender legs.................... 21
   Shorter, more thick-set species, the abdomen tapering apically...... 22
21. Abdomen enlarged apically; eyes holoptic (23, 24) . Systropus Wiedemann
   Abdomen not enlarged apically, cylindrical; males only holoptic.
   Dolichomyia Wiedemann
22. Three submarginal cells or the third antennal segment obtuse....... 23
   But two submarginal cells; third antennal segment acute (18, 19, 20, 29).
   †Geron Meigen
23. Body clothed mostly with scales, the thorax with bristles; abdomen
decumbent; antennae long (21, 22)......................Toxophora Meigen
   Body clothed chiefly with hair; abdomen not decumbent (41, 66).
   Rhabdopselaphus Bigot
24. Apical (first posterior) cell open or closed in the wing margin...... 31
   Apical cell closed before the margin of the wing and petiolate........ 25
25. Two submarginal cells .............................................. 27
   Three submarginal cells ............................................ 26
26. Head broader than the thorax; posterior orbits not excised (10, 11).
   Pantarbes Osten Sacken
   Head narrower than the thorax; posterior orbits excised . . Triplasius Loew
27. Proboscis protruding far beyond the anterior oral margin............ 28
   Proboscis not protruding beyond the oral margin.............Anisotamia Macquart
28. First basal cell much longer than the second.......................... 29
   First basal cell not longer than the second....................... 30
29. Posterior orbits of the eyes convex or only slightly emarginate in
   the middle; head small (9, 63).........................Bombylius Linnaeus
   Posterior orbits broadly and deeply emarginate; head as wide as the
   thorax ..................................................‡Heterostylum Macquart
30. Shape of the face concealed by dense hair; vein closing the discal cell
   anteriorly half as long as the ultimate section of the vein behind it.
   Anastoechus Osten Sacken
   Shape of the face plainly visible; vein closing the discal cell anteriorly
   not nearly half as long as the ultimate section of the vein behind it
   (12) .................................................. Systoechus Loew

† Painter, 1932, Tr. Amer. Ent. Soc., Iviii, pp. 139-167.
Bombylidae III.—42, Prorates; 43, Desmatomyia; 44, Eclimus; 45, Lepidophora vetusta; 46, Mythicomyia; 47, Desmatomyia; 48, Lepidophora vetusta; 49, Aldrichia; 50, Amphicarimus cincturus; 51, Stonyx clelia; 52, Aldrichia.
31. Two submarginal cells ........................................ 36
   Three submarginal cells ....................................... 32
32. Abdomen very elongate, slender and almost bare; tibiae without spicules
   (50, 53) ......................................................... Amphicosmus Coquillett
   Abdomen robust and short; pilose species; tibiae with spicules ........ 33
33. Antennae as long as the head, the third segment not longer than the
   basal two together ........................................... 34
   Antennae shorter than the head, the third segment twice as long as
   the basal two combined ....................................... Exepacmus Coquillett
34. Scutellum deeply sulcate longitudinally (38) ............. Geminaria Coquillett
   Scutellum not sulcate ......................................... 35
35. First antennal segment greatly swollen (Ploas Latreille) (60).
   Conophorus Meigen
   First antennal segment not thickened (13, 11) .............. Lordotus Læw
36. Anal cell closed ............................................... 37
   Anal cell open .................................................. 41
37. Proboscis projecting beyond the anterior oral margin .......... 39
   Proboscis short, not projecting beyond the anterior oral margin ...... 38
38. Abdomen elongate and tapering ................................ Caenotus Cole
   Abdomen short and broad, thickly pilose (35) .............. Ogecodocera Macquart
39. The intercallary vein between the fourth and fifth vein arises from the
   discal cell ...................................................... 40
   The intercallary vein arises from the fourth vein (42 Empidæ 5, 10).
   Prorates Melander
40. Face bare or short pilose; third antennal segment bare or with short,
   bristly hairs above (15, 16) ................................. Phthiria Meigen
   Face with long hair; third antennal segment with long, bristly hairs.
   Neacreotrichus Cockerell
41. The second vein ends in the first vein .......................... 42
   The second vein ends in the costa ................................ 43
42. Discal and second basal cells united (33) (Pachyneres Greene).
   Glabellula Bezzi
   Discal and second basal cells separated (25, 26, 46).
   Mythicomyia Coquillett
43. Body clothed chiefly with scales ................................ 43a
   Body clothed with hair or nearly bare, sometimes with some scales .. 44
43a. First antennal segment at least as long as the third, densely clothed
   with scales; abdomen elongate (45, 48) ...................... Lepidophora Westwood
   First antennal segment not half as long as the third, without scales;
   abdomen short .................................................. Neodischistus Painter
44. First basal cell much longer than the second .................. 46
   First basal cell only slightly longer than the second ............ 45
45. First antennal segment greatly swollen, widest apically (30).
   Calopeltea Green
   First antennal segment only a little swollen, widest in the middle.
   Sparnopolius Læw

* Painter, 1925, Tr. Amer. Ent. Soc., ii. p. 120.
Bombyliidae IV.—53, Amphicosmus cincturus; 54, Anthrax; 55, Paracosmus morrisoni; 56, Metacosmus mancipennis; 57, Exoprosopa; 58, Aphæbanthus cervinus; 59, Epaenmus modestus; 60, Conophoras; 61, Neodioplocampta rederi; 62, Parabombylius; 63, Bombylus; 64, Anthrax irroratus; 65, Desmatoneura argentifrons; 66, Rhabdoselaphus sigma.
Bombyliidae V.—67, Anisotamia; 68, Dipalta; 69, Geminaria canalis; 70, Ogcodocera; 71, Astrophanes; 72, Heterostylum; 73, Sparnopolius; 74, Anastoechus; 75, Geron; 76, Mancia nana; 77, Heterostylum; 78, Litorbynchus; 79, Conophorus; 80, Desmatoneura; 81, Epacmus, Aphæbantus.
46. Proboscis projecting strongly beyond the anterior oral margin, the labellae long and pointed ......................... 47
    Proboscis not or scarcely projecting beyond the oral margin, the labellae short and broad .......................... 51
47. Face bare, the sides above, or the clypeus with hair ......................... 49
    Face with hair in the middle at least below ......................... 48
48. Posterior border of the eyes emarginate, the facets bisected by a short bare line opposite the emargination ........................ 53
    Posterior border of the eyes not emarginate, the eyes without a bare, bisecting line posteriorly (62) ............. *Parabombylius* Williston
49. Anterior crossvein situated beyond the basal third of the discal cell .... 50
    Anterior crossvein situated at or before the basal fourth of the discal cell (17) ................................ Sparnopolius Leew
50. The anterior branch of the third vein arises only a little before the apex of the second vein (31) ...................... Sphenoidoptera Williston
    The anterior branch of the third vein originates only a little beyond the apex of the discal cell and far before the apex of the second vein (44) ................................ Eclimus Leew
51. Ocellar tubercle situated near the middle of the front (32, 56). Metacosmus Coquillett
    Ocellar tubercle situated near the vertex .......................... 52
52. Style of antenna broad and flattened, two segmented, simulating segments (43, 47) ...................... Desmatomyia Williston
    Style not broad and flattened .................................. 53
53. Posterior border of the eyes at least weakly indented and with a short, unfacettetd stripe ........................................ 54
    Posterior border of the eyes not at all indented and without any unfacetted stripe (40, 55) ....................... Paracosmus Osten Sacken
54. Third antennal segment bulbous basally and with a long, almost parallel-sided apical part .................................. 55
    Third antennal segment sub-triangular, tapering ..................... 57
55. The second vein arises at an almost right angle beyond the base of the discal cell (65) ...................... Desmatoneura Williston
    The second vein arises at an acute angle before the base of the discal cell ........................................ 56
56. Proboscis strongly projecting beyond the anterior oral margin, the labellae long and narrow; face produced; pulvilli absent (59). Epacmus Osten Sacken
    Proboscis rarely strongly projecting, the labellae broad; face usually receding; pulvilli present if the face projects (58). Aphaebantus Leew
57. Anterior oral margin close to the base of the antennae. Anisotamia Macquart
    Anterior oral margin very far from the antennal base (37, 39). Eucssia Coquillett

Neodiplocampta, new genus

Proposed for *Diplocampta raderi* Curran. The genus differs from *Diplocampta* Schiner in having the face produced, the third antennal segment rather long and conical, broad abdomen, different wing venation, etc. *Anthrax paradoxa* Jiennieke also belongs to this genus.

Family Nemestrinidae

Neohirmoneura bradleyi Bequaert.

Flies of moderate size, rather stout and compact in appearance, with many veins; thinly or densely pilose.

Head moderate in size, narrower or slightly wider than the thorax; eyes holoptic or dichoptic in the males, females dichoptic except in *Hyrmophlaha*; proboscis long to rudimentary. Antennae short and small, three segmented, and with a stout, jointed terminal arista. Tibiae without spurs; empodia pulvilliform but the pulvilli often minute. Venation complicated, the fourth and fifth veins curving forward to terminate before the apex of the wing; anterior crossvein very oblique and simulating a longitudinal vein, the basal cells both long; five or six posterior cells and two or three submarginals.

The Nemestrinids are not numerous in collections and are usually difficult to catch. I have found them only in open fields in which the vegetation is of considerable height and have observed them in considerable numbers. They hover persistently and dart quickly away at the least motion; when present in numbers their "buzz" is very obvious and they may be heard at a considerable distance. Those with long proboscis often visit flowers. In the American species the venation is relatively simple but in some species of the genus *Nemestrinus* there are numerous crossveins in the wings, and some of them have the proboscis greatly elongated. The genus *Hirmoncura* is known to live upon root feeding beetle larvae in the larval stage and it is probable that all the species are parasitic.

Three papers by Bequaert* cover the North American species, of which there are about a dozen.

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KEY TO GENERA

1. Eyes bare ................................................................. 3
   Eyes densely pilose; proboscis short and thick .......................... 2

2. Three submarginal cells, both sexes holoptic (3, 4). Hyrmpophleba Rondani
   Two submarginal cells ........................................... *Hirmoneura Meigen

3. Three submarginal cells .............................................. 4
   Two submarginal cells; proboscis short and thick (text figure).
   Neohirmoneura Bequaert

4. Proboscis very small, hardly visible, without fleshy labellae; alula rudimentary (1, 2) ........................................... *Parasymymictus Bigot
   Proboscis elongate and protruding; alula broad (5 6).
   Neorhynchocephalus Lichtwardt

* No North American species are at present known.

Nemestrinidae. 1, 2, Parasymmyctus clausa O. S.; 3, 4, Hirmophleba texana; 5, 6, Neorhynchocephalus volaticus, a third submarginal cell. b-f posterior cells.
Family Cyrtidæ

Small to moderately large flies, never elongate, pilose or nearly bare. Head small to very small, composed chiefly of the compound eyes which are usually contiguous in both sexes, the front, face or both obliterated; none, two or three ocelli present. Antennæ composed of two or three segments, with or without an apical arista, the third segment sometimes with apical bristles. Proboscis rudimentary or long, sometimes greatly exceeding the length of the body. Thorax large and convex, the squamae and scutellum large. Abdomen inflated, convex, rather orbicular. Legs moderately stout, the empodia and pulvilli pad-like. Venation variable, the veins sometimes weak and indistinct; often a supernumerary crossvein between the third and fourth veins.

This family contains a small number of species and may be recognized by the swollen thorax, inflated abdomen and small head. Ten genera are known to occur in North America. Cole* has revised the family. Insofar as known the members of the family are parasitic on spiders.

KEY TO GENERA

1. Prothoracic lobes greatly enlarged and meeting in front of the mesonotum; proboscis elongate (3, 4) .................. Philopota Wiedemann Prothoracic lobes not forming a shield in front of the mesonotum... 2
2. Proboscis small and aborted ........................................ 4 Proboscis elongate ...................................................... 3
3. Palpi absent; usually two ocelli (13, 14) .................. Lasia Wiedemann Palpi present; three ocelli situated on a more or less prominent tubercle (11, 12) ........................................ Eulonchus Gerstäcker

4. Antennæ elongate, the third segment large ...................... 5
   Antennæ short, the third segment small .......................... 7
5. Eyes pilose or pubescent ........................................... 6
   Eyes bare .......................................................... 6
6. Third antennal segment without terminal bristles (9, 10)
   *Ocnea Erickson
   Third antennal segment with terminal bristly hairs...Pialeoida Westwood
7. Antennæ inserted below the middle of the head .................. 8
   Antennæ inserted above the middle of the head .................. 9
8. Third antennal segment with three terminal setæ (7, 8).
   Pterodontia Gray
   Third antennal segment with an apical arista (5, 6).....Ogcodes Latreille
9. Eyes pilose (text figure) ........................................... 10
   Opsebius Costa
   Eyes bare (1, 2) .................................................. 11

Family Empidæ—The Dance Flies

Flies of small to medium size, though rarely over 10 mm. in length. Head more or less spherical, loosely connected with the thorax; males holoptic or dichoptic, the face sometimes almost obliterated by the approximate eyes; ocelli present. Antennæ porrect, composed of two or three segments, with or without an apical style or arista, or with dorsal arista; face receding or slightly prominent below, never with a strong mystax. Proboscis short or long, usually rigid. Thorax sometimes long and narrow, usually short, often strongly convex above. Male genitalia generally of complicated structure, often large or very large; ovipositor sometimes long and chitinized. Wing venation simple, the wings rarely absent or reduced in size; squamae small; anal and second basal cell sometimes absent or incomplete. Legs usually slender, sometimes with structural peculiarities such as elongated coxae or femora, the femora or tibiae often thickened and with spines or tubercles or with processes or fringes of scales; pulvilli distinct; empodia usually membranous and linear.

The adults are found almost everywhere but the Empids are rare in arid regions. They are most abundant in moist places, especially in woods, along streams and on the shores of ponds and lakes. All are predaceous, feeding upon smaller insects, mites, etc. As a general rule they are observed upon foliage and grass but many of them are confined to restricted habitats and others appear to be very local in distribution. Certain genera are found almost entirely on the trunks of trees and may be collected most easily by placing the mouth of the killing bottle over them, while others occur in large numbers on small flowers, notably Prunus virginiana. A few genera are found only along the seashore where they dart about among the pebbles, feeding upon small insects or upon freshly killed invertebrates.

The mating habits of the Empidæ are extremely interesting, but no more than mention of them can be made here. In some cases the males capture prey and use this food as a lure to attract the females. Sometimes the females devour the offering or it may be discarded as soon as the mating is completed. In other cases the male provides a balloon like bubble to attract the female. In some cases it is believed that copulation cannot be completed unless food is provided.

The immature stages are not well known but the larvae live in decaying vegetation, under bark, and in streams.
Melander has covered this family in Genera Insectorum* describing many new North American genera and species and presenting keys. Unfortunately the price of this work is prohibitive to the average worker so the family will no doubt receive little attention until a more readily accessible work is available.

KEY TO GENERA

1. Discal cell always united with the second basal, the anal cell always incomplete ........................................ 55
   Second basal closed apically or the anal cell complete .................. 2

2. Mesopleura obliquely longer than high ....................................... 3
   Mesopleura distinctly higher than long ................................... 4

3. Anterior pair of legs far from the middle pair, raptorial ............... 52
   Anterior legs not distant from the middle pair and not raptorial ... 43

4. Auxiliary vein distinct and separated from the first vein ............ 5
   Auxiliary vein weak and lying close to the first vein ................ 13

5. Anal cell very much longer anteriorly ..................................... 22
   Anal cell longest posteriorly, transverse apically or but little longer in front than at the middle .................................... 6

6. Costa ending at the third or fourth vein; two veins emitted by the discal cell ........................................ 8
   Costa continuing around the wing; three veins emitted by the discal cell ........................................ 7

7. Third vein forked (14) .................................................. Brachystoma Meigen
   Third vein simple (28) ................................................. Anomallemis Melander

8. Fourth vein not forked .................................................. 9
   Fourth vein forked (30) ................................................ Meghypeurus Loe

9. Pedicel of the second and third veins arising beyond the middle of the second basal cell ........................................ 10
   Pedicel arising near the basal fourth of the second basal cell (25).
   Syneches Walker

10. Vein between the first and second basal cells distinct, the first basal cell not much wider than the second .................. 11
    Vein between the first and second basal cells very weak, the first basal very much wider than the second (31) .................. Syndyas Loe

11. Third and fourth veins convergent apically .............................. 12
    Third and fourth veins parallel or diverging (1, 21) ............. Hybos Meigen

12. Disc of mesonotum without pile; palpi elongate (35).
    Lactistomyia Melander
    Disc of mesonotum more or less densely pilose; palpi short.
    Eubybos Coquillett

13. Discal cell present .................................................. 15
    Discal cell absent .................................................. 14

* Fascicle 185, 1927.
Empidæ II.—13, Oreothalia; 14, Brachystoma; 15, Hemerodromia; 16, Tachypeza; 17, Lampremis; 18, Tachypeza, front leg; 19, Drapetis; 20, Drapetis, antenna; 21, Hybos; 22, Empis; 23, Geron (Bombyliidæ); 24, Empimorpha; 25, Syneches; 26, Chelifera; 27, Hilara.
14. Posterior legs simple (41) .................. Bicellaria Macquart
Posterior femora much enlarged and spinose .... Hoplocyrtoma Melander

15. Discal cell emitting three veins apically or, if open, the fourth vein branched ............................................. 17
Discal cell emitting two veins apically .......................... 16

16. Third antennal segment conical, the arista apical; middle tibiae with several sets of bristles .................. Leptopeza Macquart
Third antennal segment oval; the arista sub-dorsal; middle tibiae with only apical bristles (7) ............................. Ocydromia Meigen

17. Posterior femora enlarged and spinose beneath (53, 57) . Edalia Meigen
Posterior femora not swollen .................................. 18

18. Posthumeral bristles present; antennae apparently two segmented.... 19
Posthumeral bristles usually absent, the antennae with three segments.
   Euthyneura Macquart

19. Antennae ending in a style ................................ 20
Antennae without style or arista (51, 59) .................. Allanthalia Melander

20. Antennae situated near the middle of the head, the third segment elongate ............................................. 21
Antennae situated much below the middle of the head, the third segment broad (60, 63) ............................. Anthalia Zetterstedt

21. Third antennal segment extremely long (45, 52) ....... Axelempis Curran
Third antennal segment normal ................................. Trichina Meigen

22. Basal and anal cells very small; third vein never forked; abdomen shorter than the robust thorax .......................... 23
Basal and anal cells not unusually short; third vein often furcate; abdomen as long or longer than the thorax ................. 25

23. Eyes pubescent ............................................. 24
Eyes bare (37) ................................................. 24

24. Face broadened below and more or less hairy; costa continuing around the wing (48, 55) .................. Parathalassius Mik
Face not broadened below and with only oral hairs .. Microphorella Becker

25. Antennae with three segments .................................. 26
Antennae apparently two-segmented .......................... Hormopeza Zetterstedt

26. Proboscis directed obliquely forward or horizontal, the face broad, convex and short .................................. 27
Proboscis normally vertical, if more or less oblique the face is long and narrow ............................................. 31

27. Auxiliary vein entire, ending in the costa .................. 28
Auxiliary vein obsolete apically ................................ Brochella Melander

28. Third vein furcate ............................................. 29
Third vein simple ................................................ 29

29. Arista terminal, sometimes style-like .......................... 30
Arista dorsal (31) ............................................... 30

30. Hypopleura bare (38) ....................................... Iteaphila Macquart
Hypopleura haired (4) ........................................ 30

Gloma Meigen

Oreogeton Schiner
31. Metapleura with hairs or bristles in front of the halteres.......................... 35
   Metapleura bare ......................................................... 32

32. Auxiliary vein ending in the costa................................................. 33
   Auxiliary vein obsolete apically (2, 9)........................... Toreus Melander

33. Auxiliary vein bending apically to meet the costa; anal angle prominent (27, 39).Hilara Meigen
   Auxiliary vein almost straight, the anal angle broadly rounded........ 34

34. Thoracic bristles strong; antennae below the middle of the head (29).
   Phileatus Melander
   Thoracic bristles almost absent; antennae at the middle of the head (3, 11).Hesperempis Melander

35. Style three times the length of the third antennal segment.
   Opeatocerata Melander
   Style not longer than the third segment............................ 36

36. First antennal segment nearly or quite as long as the third, the antennae situated high upon the head............................. 37
   First segment much shorter than the third, situated at most a little above the middle of the head............................. 38

Empidæ IV.—37, Microphorus velutinus; 38, Itaphila macquarti; 39, Hilara; 40, Empis;
41, Bicellaria; 42, Proclinopyga amplexans.
37. Arista much shorter than the third antennal segment (17).
   Lamprempis Wheeler and Melander
   Arista much longer than the third segment . . . . Porphyrochroa Melander

38. Face hairy ................................................................. 39
   Face bare ........................................................................... 40

39. Third vein furcate (21) .............................................. Empimorpha Coquillett
   Third vein simple (36) .................................................. Neocota Coquillett

40. Third vein furcate (22, 40) ......................................... Empis Linnaeus
   Third vein simple ................................................................ 41

41. Third antennal segment many times longer than wide (45, 52).
   Third antennal segment normal.............................. Rhamphomyia Meigen

43. Third antennal segment remarkably lengthened, strap-like, and without
   evident style ................................................................. 44
   Third antennal segment not remarkably long ...................... 45

44. Antennæ inserted above the middle of the head ...... Niphogenia Melander
   Antennæ inserted below the middle of the head ... Ceratempis Melander

45. Antennæ situated at the middle of the head, the third segment with a
   short style which terminates in a bristle-like segment.   Boreodroma Coquillett
   Antennæ situated above the middle of the head, the third segment
   usually with a long arista ............................................... 46

46. Third vein simple .......................................................... 47
   Third vein branched ....................................................... 48

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Empidæ V.—43 Wiedemannia hamifera; 44, Clinocera binotata; 45, Axelempis fulvithorax;
46, Chersodromia houghi; 47, Chelipoda elongata; 48, Parathallasius aldrichi; 49, Platypalpus coquilletti.
Empidæ VI. 50, Platypalpus coquilletti; 51, Allanthalia pallida; 52, Axelemis fulvithorax; 53, Edalia ohiensis; 54, Tachydromia postica; 55, Parathallasius aldrichi; 56, Chersodromia houghi; 57, Edalia ohiensis; 58, Stilpon pectiniger; 59, Allanthalia pallida; 60, Anthalia bulbosa; 61, Tachydromia pusilla; 62, Wiedemannia hamifera; 63, Anthalia lacteipennis; 64, Clinocera taos; 65, Tachyempis simplicior; 66, Chelipoda elongata.
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<td>Thorax very elongate, the humeri large; proboscis slender and not tapering</td>
<td>56</td>
</tr>
<tr>
<td></td>
<td>Thorax more robust, the humeri rarely large; proboscis thick basally and more or less strongly tapering</td>
<td>58</td>
</tr>
<tr>
<td>56.</td>
<td>Anal crossvein completely absent</td>
<td>57</td>
</tr>
<tr>
<td></td>
<td>Anal crossvein present (16, 18)</td>
<td>Tachypeza Meigen</td>
</tr>
<tr>
<td>57.</td>
<td>Front narrow, its sides nearly parallel (54, 61)</td>
<td>Tachydomia Meigen</td>
</tr>
<tr>
<td></td>
<td>Front V-shaped, wide above (65)</td>
<td>Tachyempis Melander</td>
</tr>
<tr>
<td>58.</td>
<td>First basal cell equal to or longer than the second</td>
<td>59</td>
</tr>
<tr>
<td></td>
<td>First basal cell decidedly shorter than the second</td>
<td>64</td>
</tr>
<tr>
<td>59.</td>
<td>Legs with strong bristles</td>
<td>60</td>
</tr>
<tr>
<td></td>
<td>Legs without conspicuous bristles</td>
<td>62</td>
</tr>
<tr>
<td>60.</td>
<td>Wings about one-third normal length (32)</td>
<td>Thinodromia Melander</td>
</tr>
<tr>
<td></td>
<td>Wings as long as the abdomen</td>
<td>61</td>
</tr>
<tr>
<td>61.</td>
<td>Two pairs of presutural dorsocentrals (8)</td>
<td>Coloboneura Melander</td>
</tr>
<tr>
<td></td>
<td>One pair of presutural dorsocentrals (46, 56)</td>
<td>Chershodromia Walker</td>
</tr>
<tr>
<td>62.</td>
<td>Eyes bare</td>
<td>63</td>
</tr>
<tr>
<td></td>
<td>Eyes pubescent</td>
<td>Megagrapha Melander</td>
</tr>
<tr>
<td>63.</td>
<td>Arista apical</td>
<td>Charadrodromia Melander</td>
</tr>
<tr>
<td></td>
<td>Arista dorsal</td>
<td>Micrempis Melander</td>
</tr>
<tr>
<td>64.</td>
<td>Anal cell entirely absent</td>
<td>65</td>
</tr>
<tr>
<td></td>
<td>Anal cell partly formed (19, 50)</td>
<td>Platypalpus Macquart</td>
</tr>
<tr>
<td>65.</td>
<td>Arista dorsal (58)</td>
<td>66</td>
</tr>
<tr>
<td></td>
<td>Arista apical or subapical (19, 20)</td>
<td>Drapetis Meigen</td>
</tr>
</tbody>
</table>
Family Dolichopidæ—The Long-headed Flies

Small flies rarely exceeding 10 mm. in length, usually metallic green or blue, partly dusted with whitish, brownish or grayish, rarely yellow or blackish. Diseal cell united with the second basal cell.

Head about as wide as the thorax, sometimes a little wider, usually a little higher than wide; face variable in width, sometimes practically eliminated by the approximation of the eyes, generally wider in the females than in the males; front usually wide and widening above, rarely obliterated by the approximation of the eyes in the males; with bristles above. Posterior orbits usually with orbital cilia which may be replaced below by fine hair. Proboscis fleshy, short, usually retracted; palpi flat, usually reposing on the proboscis, sometimes modified and highly ornamental. Antennæ composed of three segments, bearing a dorsal or apical arista; third segment usually more or less oval, sometimes elongated, especially in the males. Thorax convex above, sometimes with a conspicuous depression before the scutellum. Abdomen with five or six segments, conical, cylindrical, flattened, laterally compressed or more or less laterally compressed apically; hypopygium large, or small and concealed. Coxæ usually short, rarely a little elongate, the legs of moderate length, the femora usually somewhat enlarged, the tarsi of the males frequently beautifully modified, the tibiae rarely so although sometimes brightly colored. Wings hyaline or with dark markings, sometimes ornamented with black and white or of peculiar shape. Second basal and discal cells united, the anal cell short, the sixth vein short or absent, the fourth vein usually straight or only gently curved forward, rarely forming a crossvein.

The adults occur everywhere in the vicinity of water and are particularly abundant in swamps and along lightly shaded streams where they occur on mud or sand; on foliage, usually in the sun; on stones in streams; on the trunks of trees and on fallen logs. Species of Medeterus and Neurigona are normally found on tree trunks, especially those having smooth bark; Hydrophorus and Campsicnonus occur on the surface of small pools; most genera occur on mud along water, some only on sand; Diaphorus, Chrysotus and Hercostomus occur chiefly on foliage and the same is true of Condylostylus, etc. Many of the species are extremely local in habitat, occurring only where conditions are perfectly suitable. The adults are all predaceous, feeding upon smaller insects and mites. I have frequently observed them devouring midges and also small larvae occurring in the mud.
Many of the adults have very unusual mating dances which may be observed without difficulty as the species are common and soon return to their "mud flats" if disturbed. An excellent account of several of the species is given in the revision of Dolichopus by Van Duzee, Cole and Aldrich.

Little is known about the immature stages which are passed, for the most part, in mud, although some species live in the stems of grass and those of Medeterus live under the bark of trees and are definitely predaceous. Some species are said to feed upon decaying vegetation but they are probably predaceous.

The males are easily determined but the females are often difficult to name as they present less striking characters than the males. The American species were revised by Becker* but so many new forms have been described since that this work will furnish only a basis for the study of the family. The females present few structural characters and it is difficult to separate a few of the genera except by association and familiarity with the group. Several characters not previously used are employed in the key presented and most of the females are keyed out separately. With a little experience this sex should be as easily located in the correct genus as is the opposite sex and the males will trace out quite readily in this section of the key, although two or three genera are omitted as females are not available.

**KEY TO GENERA†**

1. Fourth vein with a widely divergent fork beyond the posterior cross-vein and with an appendage at the bend (16); mesonotum scarcely longer than wide ........................................ 2
   Fourth vein without such fork though often with strong curvature; mesonotum usually conspicuously longer than wide .................. 8
2. Front scarcely excavated above from anterior view .................. 3
   Front strongly excavated above from anterior view .................. 4
3. Sixth (anal) vein present .............................................. Psilopiella Van Duzee
   Sixth vein absent .............................................. Leptorhethum Aldrich
4. Arista not differentiated from the third antennal segment which is produced style-like and extremely long ...................... Megistostylus Bigot
   Arista clearly differentiated ...................................... 5
5. Arista apical ........................................................... Chrysosoma Guerin
   Arista dorsal, rarely sub-apical .................................. 6
6. Lower part of the face with hairs (83) ............................ Laxina, n. g.
   Lower part of the face without hair ................................ 7
7. Scutellum with four bristles (16, 85) .............................. Condylostylus Bigot
   Scutellum with a pair of strong bristles and sometimes a weak basal hair on either side (17, 71) ................................ Sciapus Zeller

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† Syntormon Lew appears to be distinct from Synarthrus to which our American species belong.
8. Thorax almost as broad as long; head wider than high; the front deeply excavated from anterior view; face wide (48, 51).  
*Mesorhaga* Schiner

Thorax and head different ........................................ 9

9. Basal segment of the posterior tarsi with stout bristles above (24, 42, 57). ........................................... ♦*Dolichopus* Latreille

Basal segment of the posterior tarsi without bristles above............... 10

10. Mesopleura produced as a finger-like strip along the posterior edge of the anterior coxae (20). ........................................... ♦*Liancalus* Læw

Mesopleura normal, not produced as above ................................ 11

11. Males .......................................................... 12

Females .......................................................... 64

12. Hypopygium long, extending forward under the venter .................. 13

Hypopygium short, only the lamellæ sometimes extending forward ... 25

13. Arista long pubescent, sub-plumose ................................ 14

Arista quite short pubescent or bare ................................ 16

14. Third antennal segment very large, acuminate...........*Leptocorypha* Aldrich

Third antennal segment normal, short and somewhat pointed ......... 15

15. Face wide below, roof-like over the mouth, concave in the middle (22, 25, 46, 77)........................................... ♦*Pelastoneurus* Læw

Face narrow, especially below (66, 79).............................. ♦*Sarcionus* Aldrich

16. About the posterior third of the mesonotum concave or flattened ...... 17

Mesonotum flattened only immediately before the scutellum .......... 20

17. Second antennal segment prolonged along the inner side of the third (67, 73)........................................... ♦*Celloglatus* Aldrich

Second antennal segment not prolonged along the third ................ 18

18. Hypopygium pedunculate, at least not sessile, reaching almost to the base of the abdomen ...................................... 19

Hypopygium sessile, the basal part not reaching half way to the base of the abdomen although the lamellæ may do so (45, 81).

♦*Paraphrosylus* Becker

19. Third and fourth veins strongly converging apically, the distance between them at their apices not more than half as great as opposite the posterior crossvein; bristles rarely yellow (63, 86).

*Medeterus* Fischer

Third and fourth veins separated apically by at least two-thirds the distance separating them opposite the anterior crossvein; hair and bristles yellow (31, 59)................................... ♦*Thrypticus* Gerstäcker

20. The face hangs down apron-like below the eyes (15, 38).

♦*Polymedon* Osten Sacken

The face is not produced as a long, thin ribbon.......................... 21
21. Third and fourth veins parallel apically ........................................ 22
   Third and fourth veins strongly converging apically or the fourth
   strongly curved forward ...................................................... 23
22. First antennal segment bare above (8, 33) .......... *Peloropeodes* Wheeler
   First antennal segment haired above at apex (55, 70).
   †Gymnopternus Loe\w
23. Fourth vein with a rather sharply rounded curvature and parallel
   with the third at the tip (46) .............................................. Paracaelius Bigot
   Fourth vein straight beyond the crossvein or with a gentle curvature
   (44, 61) .............................................................................. 24
24. Head conspicuously higher than wide, the face extending to the lower
   edge of the eyes; fourth vein curved beyond the posterior crossvein
   (29, 41) .............................................................................. †Tachytrechus Walker
   Head but little higher than wide, the face not reaching the lower edge
   of the eyes; fourth vein straight beyond the crossvein (61, 76).
   Hercostomus Loe\w
25. Costa reaching to the fourth vein .................................................. 26
   Costa ending at the third vein (58) ......................................... §Asyndetus Loe\w
26. First antennal segment bare above .............................................. 27
   First antennal segment haired above, at least apically .......... 27
27. Arista dorsal, rarely subapical .................................................... 29
   Arista apical or practically so ................................................ 28
28. Third antennal segment bilobed or with a strong angular projection
   below on the basal third (30, 40) ......................................... Hypocharassus Mik
   Third antennal segment triangular or subtriangular (18, 74).
   †Argyra Macquart
29. Acrostical setae absent .............................................................. 31
   Acrostical setae present, two-rowed ..................................... 30
30. Fourth vein doubly bent at nearly right angles (68, 82).
   Syntomoneurum Becker
   Fourth vein not sharply curved (3, 37) ...................... Stolidosoma Becker
31. Arista long pubescent or plumose ........................................... 32
   Arista very short pubescent or bare .................................. 33
32. Third and fourth veins parallel or only a little convergent.
   Phylarchus Aldrich
   Fourth vein strongly curved forward, very close to the third at its
   apex; (Some species of Sarcionus and Pelastoneurus might come
   here as a few have short genitalia).
33. Palpi very small; face very narrow (1) ..................... Anepsiomyia Bezzi
   Palpi larger; lower section of face twice as wide as long (5, 31).
   Diostracus Loe\w
34. Mesonotum with an elongate, longitudinal depression on the posterior
   third or slightly less ......................................................... 35
Mesonotum without such depression, usually with a slight, transverse depression ................................................................. 42

35. Acrostical setulae present, at least at the anterior edge of the thorax. 36
   Acrostical setulae absent ........................................... Micromorphus Milk

36. Third and fourth veins almost parallel beyond the crossvein .......... 37
   Third and fourth veins converging before the apex (52).
   *Neurigona Rondani

37. Acrostical setulae present only on the anterior margin of the meso-
   notum (60) ............................................................... Xanthochlorus Loew
   Acrostical setulae extending at least to the suture .............. 38

38. Sixth (anal) vein present ........................................... 39
   Sixth (anal) vein absent ........................................... 40

39. Hair and bristles wholly yellow (11) ................................ Chrysotimus Loew
   Hair and bristles not yellow (52) ................................ *Neurigona Rondani

40. Arista apical (36) ................................................... 41
   Arista sub-apical; third antennal segment pointed (62) ....... †Achalcus Loew

41. Pleura metallic (6, 7) .............................................. Collinellula Aldrich
   Pleura yellow; third antennal segment rounded apically (4, 36).
   †Xanthina Aldrich

42. Fourth vein ending well before the tip of the wing; posterior cross-
   vein very oblique (19) .............................................. 43
   Fourth vein ending but little before the tip of the wing, usually in or
   slightly behind it .................................................... 44

43. Dorsocentral bristles strong (19) ................................ Plagioneurus Loew
   Dorsocentral bristles hair-like ................................... Edematopus Van Duzee

44. Posterior crossvein situated less than its own length from the wing
   margin along the fifth vein, the basal segment of the posterior tarsi
   longer than the second (43) .................................... 45
   Posterior crossvein much shorter than the ultimate section of the
   fifth vein, or the first segment of the posterior tarsi decidedly
   shorter than the second (9) ........................................... 49

45. Pteropleura haired in front of the posterior spiracle ............... 46
   Pteropleura bare ...................................................... 47

46. First antennal segment with stout setulae below (72) ....... Melanderia Aldrich
   First antennal segment bare below (Hydrophorus pt) (80).
   Millardia, n. g.

47. Pteropleura produced to form a mammiform projection in front of
   the posterior spiracle (27, 28) ................................... §Secllus Loew
   Pteropleura plain ................................................... 48

48. Middle of the propleura haired; third antennal segment subrectangu-
   lar, the arista dorsal (26, 43, 56, 78) ...................... §Hydrophorus Fallén

† The only difference in these two genera appears to be in the shape of the third antennal
   segment. They should probably be united.
§ Van Duzee, 1926, Pan.-Pac. Ent., iii, p. 5.
Dolichopidae III.—29, Tachtytrechus; 30, Hypocharasus; 31, Thrypticus; 32, Neosyntormon; 33, Peloropeodes brevis; 34, Diostracus prasinus; 35, Parasyntormon asellus; 36, Xanthina subcura; 37, Stolidosoma permutatum; 38, Polymodon dilaticosta; 39, Chrysotus discolor.
Middle of propleura bare; third antennal segment rather triangular, the arista apical (45, 81). *Paraphrosylus Becker 49. Acrostical setulae present, though weak. 50
Acrrostical setulae absent (11). Thrinophilus Wahlberg 50. Arista apical or practically so, sometimes arising a little above the tip of the pointed third antennal segment. 51
Arista dorsal. 58 51. Propleura bare or with a single bristly hair in the middle. 53
Propleura haired in the middle. 52 52. Second antennal segment produced thumb-like into the third on the inner surface (9, 81). ‡Synarthrus Løw
Second antennal segment not strongly convex apically (21, 47, 49). §Rhaphium Meigen 53. Second longitudinal vein very strongly sinuous (65) (Eutarsus Aldrich, Van Duzee, not Løw). Diaphorus Meigen
Second vein at most gently undulate. 54
54. Second antennal segment produced thumb-like into the third; abdomen elongate and not tapering apically (35, 54). Parasyntormon Wheeler
Second antennal segment usually transverse, rarely strongly convex apically, if so the abdomen short, cylindrical and tapering from base to apex. 55
55. Body silvery white pollinose; middle of propleura with a single bristle (61) Leucostola Løw
Body rarely silvery pollinose; middle of propleura bare. 56
56. Lower section of face not differentiated. Second antennal segment transverse or gently convex apically. 57
Lower section of face strongly differentiated and large (45, 81). *Paraphrosylus Becker 57. Front narrow, if wide the apex of the abdomen with four bristles (23, 75). ‡Diaphorus Meigen
Front wide, the face usually very narrow, the apical abdominal segment without strong bristles (13, 39). §Chrysotus Meigen 58. Second antennal segment produced thumb-line into the third on the inner surface (32, 50, 69). Neosyntormon, n. g.
Second antennal segment transverse or gently convex apically. 59
59. Middle of propleura bare. 60
Middle of propleura haired. 63
60. Abdomen flattened dorsoventrally (2). *Campsicnemus Walker
Abdomen not flattened dorsoventrally. 61

* Van Duzee, 1924. Pan.-Pac. Ent., 1, p. 73.
§ Van Duzee, 1925, Tr. Amer. Ent. Soc., 1, pp. 257-257 (Syntormon).
Dolichopidae IV.—40, Hypochaiassus; 41, Dolichopus; 42, Sympycnus; 43, Hydrophorus; 44, Tachytrechus sanus; 45, Paraphrosylus; 46, Petastoneurus; 47, Rhaphe; 48, Mesorhaga, head from in front; 49, Rhaphe abdomen from side; 50, Neosyntormon; 51, Mesorhaga; 52, Neurigona; 53, Sympycnus; 54, Parasyntormon; 55, Gymnopternus; 56, Hydrophorus; 57, Dolichopus, 1st segment of posterior tarsus; 58, Asyndetus syntormoides; 59, Thrypticus; 60, Xanthochlorus; 61, Hercostomus; 62, Achalcus; 63, Medeterus.
FAMILY DOLICHOPID.E.—THE LONG-HEADED FLIES 225

61. Abdomen long and slender, more or less cylindrical, the genitalia small (42, 53) .................................................. *Sympycnus* Læw
Abdomen either tapering or short with large, asymmetrical hypopygium .................................................................. 62

62. Abdomen tapering; genitalia small; scutellum without secondary basal bristles .......................................................... Teuchophorus Læw
Abdomen short and chunky, the genitalia large, asymmetrical (Kophosoma Van Duzee, Pachypygæ Parent) (8, 33) ... †Peloropeodes Wheeler

63. Third and fourth veins rather approximate apically (12).
†Nematoproctus Læw
Third and fourth veins almost parallel beyond the crossvein (10).
Keirosoma Van Duzee

Females

64. Costa continuing to the fourth vein .................................................. 65
Costa ending at the third vein (58) .................................................. §Asyndetus Læw

65. Pteropleura produced to form a mammiform protuberance in front of the posterior spiracle (27, 28) .............................. Scellus Læw
Pteropleura not produced ........................................................................ 66

66. First antennal segment haired above .............................................. 67
First Antennal segment bare above ..................................................... 80

67. Arista plumose or very long pubescent .......................................... 68
Arista short pubescent or bare ............................................................. 70

68. No acrostical setulae ........................................................................ Phylarchus Aldrich
With acrostical setulae ....................................................................... 69

69. Face wide, bulging below (22, 25, 46, 77) ...................................... Pelastoneurus Læw
Face narrower, never strongly bulging below the middle (66, 79).
Sarcionus Aldrich
†Leptocorypha Aldrich

70. Arista dorsal .................................................................................. 72
Arista apical ......................................................................................... 71

71. Third antennal segment subtriangular or triangular (18, 74).
Argyra Macquart
Third antennal segment either furcate or with a strong, angular projection basally (30, 40) ............................................... Hypocharassus Mik

72. Propleura with hair or a single bristy hair on the median portion ... 73
Propleura entirely bare on the median portion (5, 31) ... Diostracus Læw

73. Pteropleura with a small tuft of very fine short hairs in front of the posterior spiracle (these are sometimes difficult to discern in most views); fourth vein not curved forward near the apex (55, 70).
Gymnopternus Læw
Without such hairs, or the fourth vein strongly curved forward apically ................................................................. 74

* Van Duzee, 1930, Pan-Pac. Ent., vii, pp. 35-36.
† Van Duzee, 1926, Tr. Amer. Ent. Soc., iii, pp. 39-46 (Kophosoma).
‡ Van Duzee, 1930, Psyche, xxxvii, p. 167.
* Female unknown.
Dolichopidae V.—64, Leucostola cingulata; 65, Diaphorus nigripennis; 66, Sarcionus pectinatus; 67, Cœlogluts bicoloripes; 68, Syntomoneurum alatum; 69, Neosyntormon; 70, Gymnopternus; 71, Sciapus tener; 72, Melanderia mandibulata; 73, Cœlogluts bicoloripes; 74, Argyra; 75, Diaphorus; 76, Hercostomus; 77, Pelastoneurus abbreviatus.
74. Third and fourth veins conspicuously converging apically or the fourth strongly curved ........................................... 75
    Third and fourth veins parallel beyond the posterior crossvein, or nearly so (1).............................................. Anepsiomyia Bezzi

75. Fourth vein approaching the third in a broad curve and running parallel with it at the apex.................................. Paracleius Bigot
    Fourth vein not so strongly approaching the third or not parallel with it apically (3).............................................. 76

76. A second pair of weak scutellar bristles or hairs; metaleura bare; fourth vein sometimes angularly curved........................................... 77
    A single pair of scutellar bristles; metasternum with two or three minute hairs in front of the posterior spiracle, visible only in some lights; fourth vein with single curve (3, 37)........... Stolidosoma Becker

77. Fourth vein straight beyond the posterior crossvein, though approaching the third (61, 76)............................. Hercostomus Læw
    Fourth vein curved beyond the crossvein.............................................................. 78

78. Sixth (anal) vein extending close to the margin of the wing (68).... 79
    Sixth (anal) vein extending little more than half way to the margin of the wing beyond the anal cell (15, 38).............. Polymedon Osten Sacken

79. Fourth vein bent twice in middle of apical section (68, 82).
    Syntomoneurum Becker
    Fourth vein not bent at nearly right angles (29, 44). . . Tachytrechus Læw

80. A longitudinal flat or slightly concave area on the posterior third of the mesonotum ............................................ 81
    No such area although there is usually a more or less distinct transverse depression immediately before the scutellum........ 91

81. Third and fourth veins parallel or almost so beyond the posterior crossvein ........................................... 82
    Fourth vein converging toward the third.............................................................. 86

82. Hair and bristles wholly yellow.................................................. 85
    Hair and bristles partly or wholly black or brown............................................. 83

83. Acrostical setulae in two rows.................................................. 88
    Acrostical setulae distinct only on the anterior border of the mesonotum, or absent ............................................. 84

84. Yellowish species (60).......................................................... Xanthochlorus Læw
    Black or green species....................................................................................... Micromorphus Mik

85. Sixth (anal) vein absent (31, 59)........................................... Thrypticus Gerstaecker
    Sixth vein present (11)......................................................................................... Crystotimus Læw

86. Fourth vein conspicuously doubly curved forward beyond the crossvein; sixth (anal) vein reaching the wing margin or practically so, strong and curved backward at the tip; usually large species (52).
    * Neurigona Rondani
    Fourth vein straight beyond the posterior crossvein; sixth vein weak, sometimes represented by a fold and usually curving toward the apex of the wing before its end....................... 87

87. Second antennal segment produced along the inner side of the third (67, 73) .................................................................................. Coeloglutus Aldrich
Second antennal segment not produced along the third (63, 86).
Medeterus Fischer

88. Sixth (anal) vein absent .............................................................. 89
Sixth (anal) vein extending almost to the wing margin (52).
* Neurigona Loew

89. Arista subapical (62) ................................................................. Achalcus Loew
Arista apical .................................................................................. 90

90. Pleura yellowish (4, 36) ............................................................. Xanthina Aldrich
Pleura metallic green (6, 7) ......................................................... † Collinellula Aldrich

91. Fourth vein ending well before the tip of the wing, its outer edge concave just beyond the bend ......................... 92
Fourth vein ending but little before the tip of the wing, if curved beyond the posterior crossvein there is no concavity on the outer side .............................................................. 93

92. Dorsocentral bristles strong (19) ............................................. Plagioneurus Loew
Dorsocentral bristles hair-like .................................................. (Edematopus Van Duzee

93. Posterior crossvein as long or longer than the ultimate section of the fifth vein; basal segment of the posterior tarsi longer than the second .............................................................. 94
Posterior crossvein rarely as long as the ultimate section of the fifth vein, if so, the basal segment of the posterior tarsi shorter than the second .............................................................. 97

94. Pteropleura haired in front of the posterior spiracle............... 95
Pteropleura bare in front of the posterior spiracle.................... 96

95. First antennal segment with stout setulae below (72). Melanderia Aldrich
First antennal segment bare below (Hydrophorus pt) (80).
Millardia, n. g.

96. Middle of the propleura haired (26, 43, 56, 78) ............... Hydrophorus Meigen
Middle of the propleura bare (45, 81) ................................. Paraphrosylus Becker

97. Acrostical setule present ............................................................. 98
Acrostical setulae absent (14) .................................................. Thinophilus Wahlberg

98. Arista apical or practically so, sometimes arising a little above the tip of the pointed third antennal segment ......................... 99
Arista dorsal, rarely arising a little beyond the middle of the third segment .............................................................. 105

99. Propleura bare or with a single bristle in the middle ........... 101
Propleura haired in the middle .................................................. 100

100. Second antennal segment projecting thumb-like into the third on the inner side (9, 81) ...................................................... Synarthrus Loew
Second antennal segment transverse or only gently convex apically (21, 47, 49). .............................................................. ‡ Rhaphium Meigen

† I have not seen specimens of Collinellula but the genus is very close to Xanthina and no structural differences are mentioned in the description.
101. Second antennal segment produced thumb-like into the third on the inner side (35, 54)..........................Parasyntormon Wheeler Second antennal segment transverse or only gently convex apically...102

102. Middle of propleura wholly bare...........................................103 Middle of propleura with a single bristly hair (61)......Leucostola Læw

103. Lower section of the face not differentiated, the face short......104 Lower section of the face strongly differentiated, the face reaching practically to the lower level of the eyes (45, 81). Paraphrosylus Becker

104. Diaphorus Meigen and Chrysotus Meigen come here but there are no good characters for the separation of the females.

105. Second antennal segment produced thumb-like into the third on the inner side (32, 50, 69)..............................Neosyntormon, n. g. Second antennal segment with the apex at most a little convex on the inner side ..............................................106

106. Middle of propleura bare..........................................................107 Middle of propleura haired.............................................................109

107. Abdomen flattened dorsoventrally, rarely swollen; face narrowest in the middle (2)..............................Campsicnemus Walker Abdomen cylindrical or tapering..............................................108

108. Abdomen short and tapering......................................................110 Abdomen long and slender, usually cylindrical or laterally compressed (12, 53)..............................Sympycnus Læw

109. Third and fourth veins parallel or nearly so beyond the posterior crossvein (10)..............................Keirosoma Van Duzee Third and fourth veins rather approximate apically (12). Nematoproctus Læw

110. Scutellum with a secondary pair of weak marginal scutellars situated between the base and the strong pair; sixth vein strongly developed; anal lobe distinct (8, 33).................................Peloropeodes Wheeler Scutellum without secondary basals, but with a pair of apical hairs; sixth vein weakly developed; anal lobe very weak...Teuchophorus Læw

**Laxina, new genus**

This genus is erected for those species, formerly placed in Condylostylus, Sciapus and Psilopus, in which the lower section of the face is hairy. The arista is dorsal; mesonotum rather square; scutellum with four bristles and the wings either hyaline or variegated with brown. Genotype:—Dolichopus patibulatus Say.

**Neosyntormon, new genus**

Differs from Parasyntormon Wheeler in having the arista dorsal, even though situated toward the apex of the third antennal segment. The propleura is bare and the hypopleura lacks hair. Both these char-
acters are true of *Parasyntormon* also, but all the species of *Synarthrus* Loew have both the propleura and hypopleura haired. Genitalia small. Genotype:—*Parasyntormon monticagni* Wheeler.

*P. asellus* Wheeler is the only species I have seen belonging to *Parasyntormon*. The genus *Eutarsus* Loew is close to *Neosyntormon* but both the propleura and hypopleura bear fine hair, as in *Synarthrus*. *Eutarsus* does not occur in America.

**Peloropeodes Wheeler**

In his original description of this genus one might infer that the arista is apical, but I believe this is erroneous and that the arista is inserted toward the end of the third segment in the male. The type males of *salax* Wheeler, the genotype, all lack the third antennal segment so the point cannot be cleared up at present. Both females, however, are in excellent condition and since no type has been selected for the species, I now select one of the females. On general structure there can be no doubt that both *Pachytyga* Parent and *Kophosoma* Van Duzee are synonyms.

**Teuchophorus Loew**

Wheeler has described a species from South Dakota which appears to have been correctly placed. The type is not in good condition, both wings being absent and part of the abdomen eaten away, but from what can be seen the specimen agrees well with European material taken near Leningrad. This genus is very close to *Peloropeodes* differing in having small genitalia, as in *Sympycenus*, less evident anal angle to the wings with less developed sixth vein, and the absence of a pair of small basal bristles on the scutellum in addition to the large pair. As a rule there is a pair of small hairs on the apical portion of the scutellum, absent in the species of *Peloropeodes* I have seen.

**Millardia, new genus**

This genus is proposed for the reception of species formerly placed in *Hydrophorus* Meigen in which the pteropleura bears conspicuous fine hairs and most, if not all of the species have several pairs of post-vertical bristles instead of a single pair. Genotype:—*Hydrophorus viridiflos* Walker.
Family Lonchopteridae—The Pointed-wing Flies

Lonchoptera sp.

Small, slender brownish or yellowish flies, the length 2 to 5 mm. Head bristly; ocelli present; antennae short, the third segment rounded, with a terminal arista. Legs moderately long, bristly, the pulvilli very small; empodia absent. Wings pointed apically, with only the basal crossveins, the anal cell closed; first vein very short, the fourth fureate.

The adults are found in moist places and especially along shady brooks. The larvae live under leaves and decaying vegetation; they are flat, with long bristles on the anterior two and apical segments; ten segments, the head not differentiated; posterior apiraicles broadly separated on the apical segment. The larva transforms into a prepupa within the larval skin and later into a true pupa.

The family contains less than two dozen species, all belonging to the genus Lonchoptera Meigen. A key to the American species is given below. Descriptions of them are contained in American Museum Novitates No. 696.
TABLE OF SPECIES

1. Bristles of the vertex and the orbital cilia wholly yellowish............. 4
   At least several of the upper orbital cilia black............................ 2

2. Bristles of the vertex black......................................................... 3
   Bristles of the vertex yellowish; about half the orbital cilia black.... 4

3. Wings very sharply pointed, very slightly concave posteriorly toward
   the apex, or at any rate not generally convex......................... uniseta Curran
   Wings broader and much less sharply pointed, gently convex before
   the apex ................................................................. occidentalis Curran

4. Anal vein widely removed from the border of the wing; base of fifth
   vein with four or five long bristles......................................... borealis Curran
   Anal vein fused with the posterior border of the wing; base of fifth
   vein with numerous setulae............................................... dubia Curran

Wings of Lonchoptera.—1, uniseta Curran; 2, occidentalis Curran; 3, borealis Curran.
(Courtesy American Museum of Natural History.)
Family Phoridae

Small or minute flies, often wingless, usually with a hunch-backed appearance.

Head small, rather flattened; front wide, usually bristled; face short and concave; oral opening large, the proboscis usually fleshy; palpi large, usually bristled; eyes never large, the ocelli sometimes absent in the apterous forms. Antennae with three segments, the third large, the basal two small; arista dorsal or apical. Thorax usually arched, the scutellum absent in some wingless forms. Abdomen short, usually tapering posteriorly, sometimes partly membranous, especially in the wingless forms; male genitalia often large, in the female small and projecting, large and adapted for piercing in some genera. Legs short, well developed, the tibiae with or without bristles; posterior femora usually more or less laterally compressed. Wings large, poorly developed or absent, the fully developed wings with two strong longitudinal veins and four or five fine ones.

The adults are readily recognized by their characteristic antennae and wing venation. They are found almost everywhere but are particularly abundant about decaying vegetation, on leaves and windows or in the nests of termites and ants, and following armies of ants. The alate adults move about on leaves with a quick, jerky movement which is quite characteristic of the family.
The larval habits are diverse. Some are parasitic while others are unquestionably scavengers. The larva of *Apocephalus* lives in the heads of ants, the head dropping off when the larva is mature, while that of *Cataclinusa pachychondyla* lives curled about the necks of ant larvae and feeds upon the food proffered the latter by the ants. Some species live on decaying animal matter and at least one species has been reared from honey comb. The family is one of great interest and offers an excellent field of study for patient, careful students of animal behavior.

The latest revision of the North American species is by Malloch.* The following key is adapted from Schmitz; and may prove unsatisfactory in some respects, but as I lack very many of the genera I am unable to improve upon it. Some of the characters used appear to be of little value from a generic standpoint but the species included in the genera present differences in addition to those given. Despite the title, Schmitz’ paper is little more than a generic revision insofar as the taxonomist is concerned but a complete bibliography is included.

**KEY TO GENERA‡**

1. Prothoracic spiracle lateral ...
   2. Prothoracic spiracle dorsal (18) ... *Enigmatias* Meinert

2. Supra-antennal bristles proclinate, if absent the tibiae lack isolated strong bristles ...
   18. Supra-antennal bristles erect, divergent or reclinate, if absent the tibiae bear strong bristles; never wingless ...

3. Third vein with very evident branch ...
   4. Third vein not forked or only obscurely so ...

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† 1929. Rev. der Phoriden, privately published (Dümmel, Berlin & Bonn).
‡ Checked by Dr. C. T. Brues.

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Phoridae. 8, 9. Echitomyia spinosa, dorsal and lateral views; 10, Plastophora; 11, Triphleba; 12, Aneurina; 13, Pulicophora; 14, Chonocephalus, head of ♀; 15, Beckerina, head showing bristles.
4. At least the middle tibiae with strong bristles.......................... 5
   Tibiae without conspicuous bristles (15, 21)....................... Beckerina Malloch
5. Mesopleura haired, at least in front near the spiracle............... 6
   Mesopleura bare .................................................. 8
6. Mesopleura with very long bristle................................. Chaetopleurophora Schmitz
   Mesopleura without long bristle.................................. 7
7. Posterior tibiae with from one to three rows of closely placed short
   setulae dorsally (19)............................................ Dohrniphora Dahl
   Posterior tibiae without such ciliate rows.. Chaetocnemistoptera Borgmeier
8. Third vein with closely placed setulae above (12).................. Aneurina Liow
   Third vein bare or very sparsely setulose........................... 9
9. Middle tibiae with a strong anterior bristle beyond the middle.  
   Paraspiphiphora Malloch
   Middle tibiae with a very weak bristle beyond the middle, or bare.....10
10. Posterior tibiae with one to three rows of conspicuous, short setulae
    dorsally (25) .................................................... Diploneura Liow
    Posterior tibiae without such setulae (11) ......................... Triphleba Rondani
11. Arista dorsal, at most sub-apical.................................. 12
    Arista apical ..................................................... 17
12. Middle tibiae without dorsal bristles beyond the basal third........ 13
    Middle tibiae with more than one pair of dorsal bristles........... 14
13. Eyes bare (3) ....................................................... Phora Latreille
    Eyes haired .......................................................15
14. Supra-antennal bristles present (6) ................................ Hypocera Liow
    Supra-antennal bristles absent .....................................
15. Ocelli widely separated, their triangle separated from the front an-
    teriorly by a three-ridged depression.............................. Stichillus Enderlein
    Ocelli normal, or the triangle forming a tubercle..................16
16. Eyes very large; front very narrow (26) .................. Trineurocephala Schmitz
    Eyes normal; front wide .......................................... Borophaga Enderlein
17. Posterior tibiae with a pair of bristles on the basal half (4, 24).
    Conicera Meigen
    Posterior tibiae otherwise (22)............................... Coniceromyia Borgmeier
18. Wings entirely normal in size....................................... 19
    Wings smaller than normal or absent ........................................ 46
19. Third vein forked .................................................. 20
    Third vein simple .................................................. 32
20. Posterior tibiae with a dorsal row of contiguous hairs and a postero-
    dorsal row of short cilia or at least one or two short bristles..... 23
    Posterior tibiae without the dorsal row of setulae and the postero-dorsal
    cilia ................................................................. 21
Phoridæ III.—16. Erituncula setosa; 17, Xanionotum; 18, Anigmatias, ♂; 19, Dorniphora alleni; 20, Acontistoptera melanderi; 21, Beckerina neotropica.
21. Anterior orbital bristle present. \(\ldots\) \(\text{Woodiphora}\) Schmitz
At least the anterior orbital bristle absent\(\ldots\) 22

22. All the bristles on the anterior half of the front missing (23).
\(\text{Gymnophora}\) Macquart
\(\text{Metopina}\) Macquart

23. Supra-antennals entirely missing\(\ldots\) 24
At least one pair of supra-antennals\(\ldots\) 26

24. Arista apical or subapical\(\ldots\) 25
Arista dorsal \(\ldots\) \(\text{Cremersia}\) Schmitz

25. Hypopygium large; anal segment laterally compressed, the outline lancet-shaped; fifth sternite with long apical hairs.
\(\text{Neodohrniphora}\) Malloch
Hypopygium small, the anal segment long and linear; ovipositor of female chitinized and projecting\(\ldots\) \(\text{Apocephalus}\) Coquillett

26. Front with four rows of bristles\(\ldots\) 27
Bristling of the front incomplete; arista apical.
\(\text{Acanthophorides}\) Borgmeier

27. Upper pair of post-antennal bristles erect, directed more or less outward \(\ldots\) 28
Upper pair of post-antennals proclinate or reclinate, not directed outward \(\ldots\) 29

28. Upper post-antennals distinctly proclinate and directed a little outward \(\ldots\) \(\text{Pseudohypocera}\) Malloch
Upper post-antennals directed outward (7) \(\ldots\) \(\text{Apocephalus}\) Coquillett

29. Weak vein beyond the third vein weak or absent \(\ldots\) \(\text{Syneura}\) Brues
This vein distinct \(\ldots\) 30

30. Epistoma strongly produced, tube-like \(\ldots\) \(\text{Trophithauma}\) Schmitz
Face normal, not produced \(\ldots\) 31

31. Proboscis very long and thin \((c'\ unknown)\ldots\) \(\text{Rhyncophoromyia}\) Malloch
Proboscis normal \((\text{Phalocrotophora}\) Enderlein) \((2, 5)\ldots\) \(\text{Megaselia}\) Rondani

32. Bristling of the front complete (as in \text{Megaselia}) or with additional bristles \(\ldots\) 33
Bristling incomplete, the anterior orbital or other bristles absent \(\ldots\) 37

33. Front with additional bristles on the median area.
\(\text{Pseudacteon}\) Coquillett
Front with normal number of bristles \(\ldots\) 34

34. The weak vein lying parallel with the costa absent or indistinct \(\ldots\) 35
This vein distinct \((2, 5)\ldots\) \(\text{Megaselia}\) Rondani

35. Costa short, widened and almost filling the costal cell.
\(\text{Parametopina}\) Borgmeier
Costa short but not abnormally widened \(\ldots\) 36

36. Apices of first and third veins approximate \(\ldots\) \(\text{Syneura}\) Brues
Apices of first and third veins not approximated \((10)\ldots\) \(\text{Plastophora}\) Brues
37. Bristles of the front normal except for the absence of the anterior pair of frontals. 38
Bristles of the front differing in other ways. 44

38. A weak vein lies parallel with the costa beyond the third vein. 39
This vein absent. 41

39. First vein wholly bare. 40
First vein with one or two small bristles basally (20).
Acontistoptera Brues

40. Third and fourth weak veins very strongly curved toward each other. 41
Metopina Macquart
Third and fourth veins normal (1, 13). Pulicophora Dahl

41. First vein present. 42
First vein absent (8, 9). Ecitomyia Brues

42. Front with two pairs of post-antennal bristles. 43
Front with one pair of post-antennal bristles (17). Xanionotum Brues

43. Post-antennal bristles of equal size. Ecitophora Schmitz
Post-antennal bristles of two sizes. Ecitoptera Borgmeier and Schmitz

Phorid: IV.—22. Coniceromyia vespertilio; 23, Gymnophora verrucata; 24, Conicera;
25, Diploneura; 26, Trineurocephala.
44. Post-antennal bristles not distinguishable from others along the anterior border of the front. \( \rightarrow \) \textit{Cataclinusa} Schmitz
Post-antennals absent \( \rightarrow \) \textit{45}

45. Front bristled only at the vertex and along the upper, inner margins of the antennal grooves which are narrower than the space between them; wings without basal transverse vein (11).
\textit{Chonocephalus} Wandolleck
Front narrow, only the post-antennal and pre-ocellar bristles absent.
\textit{Melaloncha} Brues

46. Wings wholly absent or microscopic. \( \rightarrow \) \textit{52}
Wings distinctly developed though small. \( \rightarrow \) \textit{47}

47. Ocelli present \( \rightarrow \) \textit{48}
Ocelli absent \( \rightarrow \) \textit{50}

48. Wings with trace of several veins. \( \rightarrow \) \textit{49}
Wings with at most the costal vein visible; halteres absent.
\textit{Ecitophora} Schmitz

49. Proboscis geniculate or bent, distinctly elongate.
\textit{Ecitoptera} Borgmeier & Schmitz
Proboscis normal \( \rightarrow \) \textit{Commoptera} Brues

50. Wing rudiments with long bristles. \( \rightarrow \) \textit{51}
Wing rudiments with hairs or cilia (8, 9) \( \rightarrow \) \textit{Ecitomyia} Brues

51. Eyes situated well behind the front margin of the head in profile;
halteres present, though small (17). \( \rightarrow \) \textit{Xanionotum} Brues
Eyes situated at the front margin of the head in profile; halteres absent (20) \( \rightarrow \) \textit{Acontistoptera} Brues

52. Ocelli present (1, 13) \( \rightarrow \) \textit{Pulicophora} Dahl
Ocelli absent \( \rightarrow \) \textit{53}

53. Thorax without bristles (14) \( \rightarrow \) \textit{Chonocephalus} Wandolleck
Thorax with bristles (16) \( \rightarrow \) \textit{Ecituncula} Schmitz
Family Platypezidæ—The Flat-footed Flies

These are small flies with short hair and bristles, characterized by the wing venation and peculiarly shaped posterior tarsi, the basal segment being (usually) much flattened and sometimes strikingly ornamented.

Head hemispherical, as broad or broader than the thorax and closely applied to it; face depressed, short and broad; eyes bare, holoptic in the males and in some females; ocelli present. Antennæ porrect, the basal two segments short, the third more or less elongate-oval, pyriform or conical, with a terminal arista. Thorax rather stout, the mesonotum and scutellum with bristles. Legs short and strong, the posterior pair more or less thickened and at least the basal segment of their tarsi thickened or variously ornamented. Wings rather large; third vein simple, the fourth sometimes forked; apical cell open; basal cells rather small; posterior crossvein rarely absent. Abdomen rather short, broad and tapering or laterally compressed; hypopygium generally small.

The larvæ have been found in fungi and are flat, oval in outline, with jointed thread-like appendages on the sides of the segments. The puparia are rather similar to the larvæ in appearance.

For the most part the Platypezids are not common in collections nor are they often met with in the field. Willisthon states that they have been observed dancing in small swarms but they are usually found upon the leaves of bushes and low trees where they move about in a characteristic, jerky but remarkably agile manner. Mr. Johnson has obtained most of his specimens of Agathomyia by sweeping foliage. The species of Callimyia prefer moist woods. Fewer than thirty North American species are known.
FAMILY PLATYPEZIDÆ—THE FLAT-FOOTED

Platypezidae.—1. Platycnema; 2. Callimyia; 3. Callimyia, hind tarsus of ♂; 4-7, Platypeza, wings and posterior legs; 8, Agathomyia, antenna; 9, Microsania pectipennis; 10, Platypezoides diversa; 11, 12, Agathomyia; 13, Callimyia.
KEY TO GENERA

1. Fourth vein furcate ........................................ 4
   Fourth vein not furcate .................................... 2

2. Discal cell closed apically .................................. 3
   Discal cell open ........................................... 5

3. First vein bare; third antennal segment elongate conical (8, 11, 12).
   *Agathomyia Verrall
   First vein setulose above; third antennal segment rather short (2, 3, 13) ..........................†Callimyia Meigen

4. The fourth vein branches close to the posterior crossvein, the posterior branch reaching the wing margin (10) .... Platypezoides Johnson
   The fourth vein branches nearer to the wing margin than to the posterior crossvein, the posterior branch not reaching the wing margin (4, 5, 6, 7) ...........................................*Platypeza Meigen

5. Third vein obsolete except apically (9) ............. Microsania Zetterstedt
   Third vein complete; three closed cells (1) ........... Platycnema Zetterstedt

† Johnson, 1916, Psyche, xxiii, pp. 27-33.
Family Pipunculidae—The Big-headed Flies

This family is characterized by the very large head and thinly pilose or practically bare body.

Head broader than the thorax, nearly spherical, composed chiefly of the large eyes; eyes of the male contiguous above the antennae or closely approximated, in the female separated by a narrow front; face narrow. Antennæ small, three segmented, the third segment oval, reniform or aculeate below; arista dorsal. Ocelli present; proboscis small, usually concealed. Abdomen composed of six or seven segments, small, cylindrical; hypopygium conspicuous, often large; ovipositor usually elongate and extending forward under the abdomen. Legs simple; tarsi broad, the basal segment elongate; pulvilli present. Wings much longer than the abdomen; basal cells elongate; anal cell reaching close to the wing margin, rarely incomplete; apical cell narrowed apic ally but always open; three posterior cells; venation incomplete in Chalarus Walker. Squamae vestigial. The wings are held flat over the abdomen when the insect is at rest.

The larvae are parasitic on bugs of the families Cicadellidae and Miridae, and perhaps on other Homoptera and Heteroptera. The larvae are elliptical, thick, depressed and narrowed at either end, naked and small. The oval, shining black puparia are obtuse at either end and somewhat smaller than the larvae.

Pipunculidae are found commonly wherever their hosts are to be found, but more especially near the edges of woods, in clearings and along shaded lanes. I have found them in large numbers in a small clearing in which the ground was kept constantly moist from a spring at one end and also along the edges of streams. Almost one hundred species are known from North America, most of which belong to the genus Pipunculus. Cresson* has monographed the family.

KEY TO GENERA

1. Discal cell closed ......................................................... 2
   Discal cell open apically the venation incomplete (3) .......... Chalarus Walker

2. Scutellar bristles present.............................................. 3
   Scutellar bristles absent (1, 2)..................................... Pipunculus Latreille

3. Ocellar bristles absent; occiput widely visible from the side (6, 7).
   \textbf{Nephrocerus} Zetterstedt
   Ocellar bristles present; occiput narrow (4, 5)................. Verrallia Mik

Family Syrphidæ—The Flower Flies

Small to large flies, the wing with a "spurious vein" lying between the third and fourth longitudinal veins.

Head variable, but never elongated, except rarely the produced epistoma. Face moderately wide to wide; eyes usually holoptic in the males, always dichoptic in the females. Oral opening large; proboscis usually short. Antennæ short or elongate, composed of three segments, usually with a dorsal arista, rarely with a terminal style. Ocelli present. Thorax rather large and robust, rarely with bristles. Abdomen composed of four to six visible segments; hypopygium rarely prominent, though often large. Legs variable but never elongate. Wings comparatively large; third vein never branched, straight or dipped into the apical cell, the apical cell closed; basal cells long; anal cell closed before the margin of the wing, always long; between the third and fourth veins a strong fold or "spurious vein", rarely absent, which is characteristic of the family.

The Syrphidæ comprise one of the largest and most popular groups of Diptera. They may be found anywhere and many species are very common. Most of them visit flowers but some occur only in woods, in moist places, in fields, or near ants' nests, depending upon their habits. The adults display great variation in habitus but may be recognized at once by their characteristic wing venation. Any locality with varied habitat should yield at least a hundred species and the general collector is certain to have many of them in his collection. Most of the common species are easily recognized by the use of "Williston's Synopsis" but on the whole the family is a difficult one, many of the genera and species being difficult to separate by means of keys and descriptions. Unfortunately there is no recent revision of the North American forms of which less than half are included in Williston's work. The number of short papers dealing with the family is very large and the literature scattered through numerous periodicals. Many attempts have been made to divide the Syrphidæ into subfamilies but with little success. Some of the groups may be well defined in one region but almost every character thus far used is found to lose its value when the study is extended to include the world fauna.

Almost all of the Syrphids are beneficial and they are second in importance only to the bees as pollinators of plants. Many of them live upon aphids, (plant lice) and mealy bugs in the larval stages. A few are known to be definitely injurious.
The larvae are variable in habits and form. Some live in the nests of ants, termites, bees, etc., but nothing is known regarding their relationship to their hosts. Most of them live in decaying vegetation, while a very few are injurious to growing plants and bulbs. Among the well-known larval forms are the rat-tailed maggots which may be found in liquid media containing decaying vegetation and very rarely in carrion. The larvae may be divided into four types: the Microdon type, with an unusually hard, convex upper surface and flat, soft ventral surface; the Syrphus type, some of which approach the first group in appearance, living upon aphids, decaying vegetation and plants; the short-tailed maggots, living in decaying vegetation; and the rat-tailed maggots which live in liquid media.

In the key to the genera several minute characters are used. These may prove difficult at first but once the student is familiar with them they will be found to be most useful. In some cases there may be difficulty in deciding the genus to which a species belongs but comparison with specimens of known genera will aid in reaching a decision. The final recourse, after careful study, is to send the puzzle to a specialist and receive his opinion. Most of them will gladly tell you what it is and return the specimen.

KEY TO GENERA

1. Antennae with a terminal style, the third antennal segment tapering... 2
   Antennae with a dorsal arista, if sub-apical the third segment is not tapering from the base .................................. 3

2. Eyes bare (24, 46, 51) ...................................... * Cerioides Rondani
   Eyes pilose .................................................. Callicera Panzer

3. Arista bare; antennae usually longer than the convex, pilose face; third vein usually with a stump of vein extending into the apical cell; anterior crossvein situated before the middle of the discal cell; apical crossvein often recurrent .................................. 4
   Arista variable; antennae usually shorter, if elongate the humeri are bare, or the arista plumose; face concave, tuberculate or carinate, never rather evenly convex ........................................ 6

4. Third vein with a stump of vein extending into the apical cell.... 5
   Third vein without such stump but there may be one from the fourth vein and from the apical crossvein .................. Mixogaster Macquart

5. Abdomen spatulate ........................................... Rhopalosyrphus Arribalzaga
   Abdomen not spatulate (1, 53, 59) .................................. † Microdon Meigen

6. Humeri pilose ............................................. 7
   Humeri bare, often mostly concealed by the occiput .................. 18

Syrphidae II.—25, Ferdinandea; 26, Volucella fasciata; 27, Eunymiolepta auricaudata; 28, Syritta pipiens; 29, Xylofa pigra; 30, Pipizella; 31, Platycheirus erraticus; 32, Syrphus wiedemannii; 33, Sericomyia militaris; 34, Polydontomyia curvipes; 35, Sceva pyrastris; 36, Tropidea quadrata; 37, Baccha lemur; 38, Trichopsomyia; 39, Baccha; 40, Apophysophora (S. Amer.); 41, Chrysotoxum.
7. Face perpendicular, with a swelling above; anterior crossvein at the basal fourth of the discal cell; antennae elongate and porrect; abdomen strongly constricted basally..............Mixogaster Macquart 8

8. All the femora with a patch of black setulae on their bases anteriorly; third vein strongly curved into the apical cell................................. 91

9. Arista plumose, rarely pectinate; legs never with bristles.......... 10

10. Apical crossvein recurrent............................................. 11

11. Face with three strong tubercles, one on either side of the median tubercle (76)......................*Ornidia St. Fargeau and Serville 15

12. Arista bushy plumose, appearing more or less strap-like (14, 65, 75). 12

13. Arista pectinate, the upper rays long, the lower ones extremely short. Volucellosia Curran 13

14. Eyes of the male widely separated, the front much longer than the face .......................................................... Megametopon Gigli-Tos 14

15. Facial side margins very distinct and extending almost to the base of the antennae .............................................. 43

16. Apical crossvein strongly recurrent, the first posterior cell longest in the middle and usually with an appendage at this point (66, 78). Citibaena Walker 16

17. Genitalia entirely concealed by the strongly convex abdomen when seen from the side; third antennal segment orbicular, very large; anterior crossvein situated before the middle of the discal cell (67, 79). Nausigaster Williston 17

18. Antennae elongate and porrect; thorax and abdomen with bright yellow markings; wasp-like flies (23, 41, 82)..........................§Chrysotoxum Meigen 42

† Curran, 1930, Amer. Mus. Novit. No. 413, p. 3.
§ Shannon, 1926, Pr. U. S. N. M., lxix. Art. 11, p. 3.
Antennæ shorter, if somewhat elongate they are decumbent and the abdomen drooping or wholly black. 19

19. Face and scutellum more or less yellowish or translucent (if the face is entirely black the abdomen is oval and little more than twice as long as wide) 20
Face wholly black, the scutellum rarely with a yellow tip 38

20. Abdomen drooping, never with yellow fasciae in American species though often largely reddish; third antennal segment more than twice as long as broad; small species (7, 80) Paragus Latreille Abdomen not normally drooping; antennæ usually short, the third segment rarely twice as long as wide, the abdomen usually with yellow spots or bands 21

21. Abdomen margined (the immediate lateral margins raised and not curving under) (43) 22
Abdomen not margined, the thin side margins curving under 27

22. Species with long pile, the base of the abdomen broadly pale yellowish, the abdomen moderately broad; eyes pilose (68, 81).

Leucozona Schiner
Species with shorter pile and usually with yellow markings beyond the second segment 23

23. Pleura with very bright, sharply limited yellow markings; front long and narrow Xanthogramma Schiner Pleura with diffuse yellowish markings or none; sides of mesonotum sometimes yellow 24

24. Third vein dipped into apical cell; third antennal segment long, robust, pointed; front not inflated; eyes bare; abdomen broad and flat, with wide fasciae Didea Macquart Third vein rarely dipped into apical cell, if so the eyes are pilose or the abdominal spots are arcuate and the front more or less inflated. 25

25. Male genitalia projecting, long and cylindrical; abdomen of female broadly oval, the fifth segment half as long as the fourth (84, 85).

Eupeodes Osten Sacken Male genitalia normal; if the fifth segment of the female is about half as long as the fourth the abdomen has sub-parallel sides and the front is not whitish yellow immediately above the antennæ. 26

26. Wings practically without villi; front very much swollen; apical cell much broadened on the apical half (35, 86, 87) Seæva Fabricius Wings largely villous; front seldom much swollen; apical cell widened in only a few species (9, 10, 32, 43, 47) *Syrphus Fabricius 27

27. Pleura with sharply limited yellow markings; no yellow prescutellar spots; mesonotum without cinereous vitta; abdomen elliptical.

Xanthogramma Schiner Pleura with or without sharply limited yellow markings, if present the abdomen is long and narrow or the mesonotum bears a cinereous median vitta 28

28. Abdomen dark except for a pair of large, basal yellowish spots; eyes pilose Ischyrosyrphus Bigot Abdomen differently marked; eyes bare 29

Syrphidae IV.—54, Criorrhina caudata; 55, Brachyopa basilaris, head from in front; 56, Brachyopa basilaris; 57, Brachyopa nigricauda; 58, Chalcosyrphus depressus; 59, Microdon fulgens; 60, Cynorhina nigripes; 61, Chalcosyrphus depressus; 62, Chalcomyia aerea; 63, Cynorhina metcalfe; 64, Cynorhina pictipes.
29. Pleura with sharply limited yellow markings or largely yellow, or the abdomen very long and often spatulate. 31
Pleura blackish with at most diffuse yellow markings; rarely a pair of small yellow prescutellar spots; abdomen elliptical or with parallel sides .................................................. 30

30. Abdomen very long, the face and front narrow, the former narrowed below (37, 39, 71). *Baccha Fabricius Abdomen not remarkably long, the face not narrowed below (42).
†Epistrophe Walker

31. Abdomen very long, club-shaped, spatulate or with parallel sides; face strongly narrowed below; if the abdomen is rather short it is almost unicolorous ................................................................. 36
Abdomen of moderate length; never spatulate, if rather short and with parallel sides it bears bright yellow markings......................... 32

32. Large wasp-like species; a pair of small yellow prescutellar spots (83) ................................................................. Doros Meigen
Smaller species, never over 10 mm. in length ...................... 33

33. Mesonotum with a median cinereous or metallic vitta; abdomen usually short oval, always very much flattened.......................... 34
Mesonotum without such vitta; abdomen with parallel sides or pointed apically in female ................................................. 35

34. Posterior femora strongly arcuate in male, the female abdomen tapering apically (89, 90). Toxomerus Macquart
Posterior femora simple; female abdomen obtuse apically.
‡Mesogramma Lœw

35. Male hypopygium globosely enlarged; fifth abdominal segment of the female with fascie which may be broken into spots (72, 88).
§Sphaerophoria St. Fargeau and Serville
Male genitalia small; fifth segment of female with four spots, the median pair longitudinally placed, the outer pair oblique.
ŠAllograpta Osten Sacken

36. Third vein rather deeply looped into the apical cell (Tropical) (11).
Salpingogaster Schiner
Third vein not deeply looped into the apical cell .................. 37

37. Apical crossvein transverse ........................................ Calostigma Shannon
Apical crossvein oblique, usually curved (37, 39, 71). *Baccha Fabricius

38. Abdomen cylindrical basally (37, 39, 71). *Baccha Fabricius
Abdomen with parallel sides or elliptical ................................................ 39

39. Wings shorter than the abdomen (69, 70, 73, 74). Pyrophæa Schiner
Wings longer than the abdomen .............................................. 40

Syrphidae V.—65, Copestylum marginatum; 66, Citibæna; 67, Nausigaster punctulata; 68, Leucozona americanum; 69, Pyrophaena granditarsis; 70, Pyrophaena granditarsis, abdomen; 71, Baccha fuscipectenas; 72, Spherophoria cylindrica, abdomen; 73, 74, Pyrophaena granditarsis, front and middle tibia and tarsi; 75, Copestylum marginatum; 76, Ornidia obesa; 77, Volucella bombylans; 78, Citibæna; 79, Nausigaster; 80, Paragus tibialis; 81, Leucozona americanum; 82, Chrysotoxum; 83, Doros equalis; 84, 85, Eupeodes volucris,♂ abdomen and genitalia; 86, 87, Scava pyrastrî; 88, Spherophoria cylindrica; 89, 90, Toxomerus geminatus, hind leg and head.
40. Abdomen broad and flat; face narrowed below; tip of scutellum usu-
ally yellow ................................................. Xanthandrus Verrall
Abdomen with parallel sides, less flattened; face at most parallel
sided, usually widened below; scutellum wholly black.......... 41

41. Male with the anterior tibiae or tarsi, or both, dilated (31, 100, 101).
*Platycheirus* St. Fargeau and Serville
Legs simple (41, 48)...........................................†Melanostoma Schiner

42. Anterior crossvein situated well before the middle of the discal cell,
or the mesonotum with bristles (91)............................. 43
Anterior crossvein situated at or beyond the middle of the discal cell,
 thorax rarely with short spines (115)............................. 65

43. Eyes bare .......................................................... 44
Eyes pilose ............................................................ 45

44. Facial grooves extending almost to the antennæ; fourth vein joining
the third well before the wing-tip; thorax often with bristles; an-
terior crossvein near the basal third of the discal cell; arista often
plumose (45, 91, 101).............................................‡Cartosyrphus Bigot
Facial grooves less distinct or the anterior crossvein near the middle
of the discal cell ................................................. 50

45. Facial grooves distinct and extending almost to the antennæ (8, 49).
§Cheilosia Meigen
Facial grooves usually forming pits below and never extending dis-
tinctly to near the antennæ........................................ 46

46. Face evenly receding, the anterior oral margin projecting. †Psilota Meigen
Face tuberculate, or the oral margin not conspicuously projecting... 47

47. Face not widening below ........................................... §Pipiza Fallen
Face not wider below than at the antennæ.......................... 48

48. Middle tibiae slender, not convex anteriorly from dorsal view....... 49
Middle tibiae in male conspicuously broadened, in the female slightly
broadened and gently convex anteriorly from dorsal view; middle
coxæ of male with small slender process near their inner end.
†Cnemodont Egger

49. Fifth sternite only half as long as the fifth tergite in the male;
antennæ of female elongate oval................................. §Heryngia Rondani
Fifth sternite three-fourths as long as the tergite; antennæ of female
more than twice as long as wide; eyes usually with an indistinct,
transverse, less thickly pilose stripe (6, 30).................. †Pipizella Rondani

50. Mesonotum with strong bristles, the legs never bristled; abdominal
piles erect; face tuberculate (25, 99).......................... Ferdinandea Scopoli
Mesonotum without bristles or the legs also with bristles.......... 51

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Syrphide V.—91, Cartosyrphus; 92, Chrysogaster nigrovittata; 93, Neoascia globosa; 94, Sphegina infuscata; 95, Rhingia nasica; 96, Hammerschmidtiella ferruginea; 97, Brachyopa notata; 98, Merapioidus villosus; 99, Ferdinandea croesus; 100, Platycheirus quadratus; 101, Platycheirus peltatus, front tibia and tarsus; 102, Chrysogaster; 103, Peleocera pergandei; 104, Cartosyrphus; 105, Sphegina infuscata; 106, Neoascia globosa; 107, Myiolepta nigra; 108, 109, Chalconyx aerea, ♀ ♂; 110, Merapioidus villosus; 111, Brachyopa notata; 112, Rhingia nasica; 113, Hammerschmidtia; 114, Criorrhina.
51. Third antennal segment elongate; apical crossvein more or less recurrent (2, 3, 50) .................. Orthoneura Macquart
Third antennal segment never twice as long as wide ............... 52

52. Disc of abdomen opaque black, the sides shining (1, 52, 92, 102).

Chrysogaster Meigen
Disc of abdomen either wholly shining or with shining spots or bands. 53

53. Abdomen constricted basally or the third antennal segment very large 54
Abdomen broad; third antennal segment of normal size ............ 57

54. Antennae with a terminal arista on the produced upper angle (103).
Pelecocera Meigen
Antennae with dorsal arista, the third antennal segment not produced at point of its insertion ........................................ 55

55. Abdomen not constricted basally ...................... Chamaesyrphus Mik
Abdomen petiolate .................................................. 56

56. Third antennal segment longer than wide; arista shorter than antennae (93, 106) .................. *Neoascia Williston
Third segment at most slightly longer than wide, the arista longer than antenna (91, 105) .................. †Sphegina Meigen

57. Face wholly black in ground color .......................... 58
Face partly yellow in ground color .................................. 61

58. Hair of the thorax and abdomen scale-like and appressed.

Lepidostola Williston
Pile not scale-like, much of it erect .................................. 59

59. Scutellum large, subquadrate; male dichoptic .................. 60
Scutellum rounded apically; male holoptic (107) ............ Myiolepta Newman

60. Mesonotum with a large, flattened rectangle posteriorly (58, 61).

Chalcosyrphus Curran

61. Pile mostly scale-like and closely appressed (27, 124, 125).

‡ Eumyiolepta Shannon
Pile normal ........................................................................ 62

62. Legs bearing distinct bristles (96, 113) .................. Hammerschmidtia Schummel
Legs without bristles ................................................................ 63

63. Epistoma produced into a long, porrect snout (95, 112) .. Rhingia Scopoli
Epistoma not produced snout-like ........................................ 64

64. The costal vein ends at the tip of the wing (55, 56, 57, 97, 111).

§ Brachyopa Meigen
The costal vein ends before the tip of the wing (60, 63, 64).

65. Mesonotum with distinct yellow markings in addition to those on the humeri ........................................... 78
Mesonotum without distinct yellow markings, although the humeri may be yellow, sometimes partly or wholly pollinose........ 66

66. Third longitudinal vein moderately curved into the apical cell........ 83
Third longitudinal at most slightly curved into the apical cell...... 67

67. Face produced downward; usually an indication of facial tubercle... 68
Face produced well forward and somewhat downward or evenly con-
cave and not produced downward................................... 72

68. Pile long and furry; flies bumble-bee-like in appearance.......... 69
Pile shorter; flies not bumble-bee-like.............................. 70

69. Arista placed at the tip of a conically produced third antennal seg-
ment (98, 110)..................................................Merapioidus Bigot
Arista dorsal, not situated on a prominence (54, 114). *Criorrhina Meigen

70. Antennae inserted on a long, conical prominence; face retreating
below (115, 123)..............................................Somula Macquart
Antennae not situated on a strong prominence, inserted lower down on
the head; abdomen shorter and broader............................ 71

71. Posterior femora swollen and with an apical projection below; abdo-
men of the male rather slender, wholly black (116, 126).
Cynorhinella Curran
Posterior femora simple (60, 63, 64)..............................?Cynorhina Williston

72. Epistoma produced forward and downward (117, 152).
Crioprora Osten Sacken
Epistoma not produced downward or forward beyond the antennal
prominence ...................................................... 73

73. Bumble-bee-like flies, the pile very thick (118, 127).
Pocota St. Fargeau and Serville
Not bumble-bee-like, the pile rather thin......................... 74

74. Face tuberculate...........................................‡Calliprobola Rondani
Face concave or carinate ....................................... 75

75. Face carinate; posterior femora greatly swollen...§Planes Rondani
Face concave in profile............................................ 76

76. Pile of the scutellum thick and rather long but not concealing the
ground color; head quite flat or gently concave above from anterior
view; posterior femora with small tubercles below.
Brachypalpus Macquart
Pile thinner and shorter, few of the hairs as long as the scutellum;
head not quite flat above......................................... 77

77. Abdomen bright metallic aeneus with opaque-black bands and brassy
or golden yellow pile; posterior femora slender and with black setae
beneath on almost the whole length; abdomen subcylindrical (Geno-
type, Calliprobola crawfordi Shannon) (119, 128).
‡Chrysosomidia, n. g.

‡ No North American specimens I have seen belong to this genus.
§Shannon, 1926, Pr. U. S. N. M., ixix, Art. 9, p. 12.
Abdomen differently colored; posterior femora usually with low ridge on the apical fourth bearing stout, short, spinose setae; head gently convex above from anterior view; abdomen not wholly pale pilose (29, 130). *Heliophilus Meigen 78. Face produced downward, longer than the front; pale mesonotal markings pollinose (120, 129). †Sphecomyia Latreille Face not conspicuously produced, shorter than the front; if doubtful the pale mesonotal markings are of the ground color. 79

79. Face broadly carinate, convex in profile.............Ceriogaster Williston
Face concave or more or less tuberculate.............................. 80

80. Face produced somewhat downward and weakly tuberculate (60, 63, 64) ........................................*Cynorhina Williston
Face concave, not tuberculate........................................... 81

81. Abdomen with yellow pollinose fasciae............................... 82
Abdomen brassy, with opaque black fasciae (119, 128).
†Chrysosomidia, n. g.

82. Posterior femora with a tooth-like projection below near the apical
end ............................................................*Spilomyia Meigen
Posterior femora simple (21, 22, 132).
†Temnostoma St. Fargeau and Serville

83. Posterior femora with a bifid spur below; face concave, subcarinate
(121, 131)..............................Senogaster Macquart
Posterior femora without such spur..................................... 84

84. Posterior femora very greatly swollen, never with a triangular
preapical protuberance, though usually spinose; head almost circular, the cheeks linear (28, 133, 131)....Syritta St. Fargeau and Serville
Posterior femora much less swollen; head not globose............... 85

85. Posterior femora with a small, toothlike projection below toward the
apex§ (20, 122) .............................................Mileisia Latreille
Posterior femora not toothed, sometimes with a triangular process
apically .......................................................... 86

86. Posterior femora with a triangular projection apically (19, 36, 135).
†Tropidia Meigen
Posterior femora without such process.................................. 87

87. Posterior femora strongly swollen and strongly arcuate, their tibiae
with a median internal spur in the male (136, 137).
Teuchocnemis Osten Sacken
Posterior femora much less swollen and but little curved; tibiae
simple; mesonotum ochraceous pollinose (138).....Pterallastes Law

88. Abdomen with pale spots or fasciae................................. 89
Abdomen without pale spots or fasciae, rarely reddish in ground color
beneath thick reddish pile on the second segment..................... 90

89. Posterior calli with short, stout bristles; abdominal spots more or
less orbicular................................................Condidea Coquillett
Posterior calli without bristles; abdomen with narrow pale fasciae
at least beyond the second segment (16, 33, 139)....[Sericomyia Meigen

90. Face very broad and swollen; body pile almost unicolorous.
Pyritis Hunter
Face not unusually broad; pile bicolored (15, 144)....Aretopha Schinner

91. Marginal cell closed and petiolate..................................... 92
Marginal cell open.................................................. 95

§ Absent in some Oriental species.
92. Epistoma produced into a long, porrect snout. \textit{Lycastrirrhyncha} Bigot

93. Eyes light brown with numerous small brown spots. \textit{Lathyrophthalmus} Mik

94. Thorax with yellow markings of short, squamose hairs (140, 142).

95. Posterior femora before the apex with a strongly raised, sub-triangular ridge, the base with a distinct spur. \textit{Merodon} Meigen

96. Eyes pilose

97. Third antennal segment not longer than wide (141, 147).\textsuperscript{‡} \textit{Mallota} Meigen

98. Mesonotum densely and evenly yellow pollinose, the ground color concealed; face concave in female; with a tubercle but receding below in the male (138). \textit{Pterallastes} Löw

99. Large robust species, the thorax thickly yellow or orange pilose, rarely whitish; posterior femora swollen and arcuate in both sexes; rather bumble-bee-like flies (141, 147) \textsuperscript{‡} \textit{Mallota} Meigen

100. Posterior tibiae ending in a spur or triangular production, never transverse on the ventral apex

101. Posterior tibiae transverse or rounded apically, never produced

102. Large species, at least 12 mm. in length, the mesonotum at most obscurely vittate (34, 145, 148) \textit{Polydontomyia} Williston

103. Stigma simulating a crossvein

104. Ocellar triangle extremely large in both sexes, the outer ocelli lying very close to the eyes (150) \textit{Asemosyrphus} Bigot

\textsuperscript{*} Curran, 1930, Amer. Mus. Novit. No. 411, p. 3.


Family Conopidæ—The Thick-headed flies

Rather thinly pilose or nearly bare, elongate flies of moderate size. Head broad, the front broad in both sexes; ocelli present or absent. Antennæ with three segments, the third bearing a dorsal arista or terminal style. Oral opening large, the proboscis long and slender, often geniculate. Abdomen often constricted basally, the genitalia of both sexes conspicuous, often large or greatly elongated in the females. Anal cell closed, the first basal cell always very long, the second moderately long; apical cell closed or much narrowed. Above the antennæ an inflatable ptilinum.

The Conopids are commonly found about flowers and are sluggish in flight. They occur from spring to autumn but are much more common during the spring and early summer. The species of Stylogaster are rapid in flight, the flies being great hoverers. I have found them in the tropics in rather large numbers hovering over ant armies where they usually remain a few inches above the ground, suddenly disappearing, only to reappear in another patch of sunlight. In the north I have found them only about flowers of the Labiatae and have observed them hovering as they sucked the nectar. Many of the species resemble Hymenoptera.

The members of this family are parasitic, mostly upon bees and wasps, oviposition usually occurring during flight. There are also records of parasitism on Orthoptera and the species of Stylogaster are in some way connected with ants but the exact relationship is unknown.

The generic and specific limits in the family are, for the most part, not sharply drawn, and this is especially true in the case of Conops and Physocephala. There have been a number of papers published dealing with the family in whole or in part; the most important of these is referred to in the footnote.

KEY TO GENERA

1. Antennæ with a terminal style.................................................. 2
   Antennæ with a dorsal or subdorsal arista........................................ 4

2. Face with deep lateral grooves............................................... 3
   Face without lateral grooves, the median carina strong; ocelli vestigial (4).................................................................................. Tropidomyia Williston

Conopidæ.—1, Conops xanthopareus; 2, Physocephala furcillata; 3, Zodion fulvifrons; 4, Tropidomyia bimaculata; 5, Occemya modesta; 6, Myopa clausa; 7, Dalmannia picta; 8, Stylogaster neglecta.
3. Anterior crossvein situated at most a little beyond the middle of the
discal cell; femora regular in outline .......................... 9
Anterior crossvein situated well beyond the middle of the discal cell;
femora swollen basally, narrowed on the apical half or more (2).
*Physocephala Schiner

4. Proboscis geniculate .............................................. 5
Proboscis straight, directed forward (3)...........................Zodion Latreille

5. Vertex and tibiae without bristles; face grooved.................. 6
Vertex and the apex of the tibiae with bristles; face not grooved (8).
†Stylogaster Macquart

6. Anal cell much longer than the second basal........................ 7
Anal cell but little longer than the second basal (7). Dalmannia Desvoidy

7. Cheeks narrower than the eye-height.................................. 8
Cheeks at least as wide as the eye-height (6).......................Myopa Fabricius

8. Antennae longer than the front; propleura haired (5)...Oecemya Desvoidy
Antennae shorter than the front; propleura bare..................Sicus Scopoli

9. Third antennal segment much longer than either the first or second.
Aconops Kröber
Third antennal segment at most slightly longer than the first or
second (1)..........................................................‡Conops Linnaeus

‡ Kröber, 1927, Konowia, vi, p. 139.
Family Pyrgotidae

Elongate flies of moderate size, the ocelli absent in the North American genera, present only in Teretrura Bigot of the American forms; wings long, the legs somewhat elongate.

Head large, the front more or less produced, without frontal bristles; ocelli absent (present in only one American genus); cheeks wide; proboscis thick, the labellae well developed; palpi large, flattened, or the proboscis narrow and short without labellae and the palpi narrow; antennae short to moderately long, the second segment without a dorsal excision, the third usually larger than the second, rarely minute. Legs moderately long. Wings long; auxiliary vein long, ending free or in the costa; apical cell widely open, not narrowed apically; anal cell usually triangular apically. Abdomen long, sometimes elavate in the males; female genitalia large, more or less cylindrical.

Species of the genus Pyrgota are parasitic in the larval stage on June beetles (Scarabaeidae) and the flies are sometimes common in the vicinity of badly infested fields. I suspect that Pyrgotella chaunoni Johnson is parasitic on species of Dichelonyx but my suspicion is based merely upon the fact that I have observed this species commonly in an open woods where the adult beetles were very common. The flies apparently are most active on dark days, in the evening or at night and they frequently are attracted to light. They are nocturnal and P. undata Wiedemann has been observed ovipositing on adult June beetles during flight. The flies select the soft part of the abdomen beneath the opened elytra in order to lay their eggs and the beetles have been observed on the ground making a loud noise as they struggled to escape the fly.

The exact limits of this family have not been definitely determined, and it is not certain that the species possessing ocelli should be retained in the family. Nothing of a definite nature is known of the immature stages of any of the American genera other than Pyrgota. There are two North American genera and three from South America that have been assigned to the family.
Pygotidae.—Figures 1-4, Tauroscypon guiana; 5, Pyrgota undata.
KEY TO AMERICAN GENERA

1. Ocelli absent ................................................................. 2
   Ocelli present (Chile).................................................. Teretrura Bigot

2. Third antennal segment as large as the second.................. 3
   Third antennal segment minute, the arista curved over the second seg-
   ment and with long rays on the free side (British Guiana) (1-4).
   Tauroscypson Curran

3. Alula very narrow .......................................................... 4
   Alula large, convex behind (5).......................... Pyrgota Wiedemann

4. Apex of anal cell transverse' (Type: Pyrgota chagnoni Johnson).
   Pyrgotella, n. g.
   Apex of anal cell with triangular production behind (Bolivia).
   Leptopyrgota Hendel
Family Otitidæ—The Pictured-wing Flies

Paneryma elongata.

Rather small to moderately large flies, the wings usually marked with brown, black or yellowish.

Eyes separated in both sexes; frontals usually limited to the upper part; face variable, the oral vibrissae always absent; clypeus usually well developed; proboscis short and stout; palpi large. Abdomen with five or six segments, the basal two more or less coalescent; male with long, curled penis, the female with a flattened, three segmented ovipositor. Legs short and stout or moderately long, the preapical tibial bristle present or absent. Wing venation usually complete, the anal cell absent in one genus; auxiliary vein separated from the first vein though often approximated to it, second basal and anal cells of moderate size.

The adults are usually found in moist places and many of the species are very common. This family is cosmopolitan but the species are most numerous in the tropics, particularly in South and Central America. Several of the species have the head strongly produced laterally and one fairly common species of Richardia has the eyes situated on long stalks, but this is a male character only.

Little is known about the immature stages although the larvae of Tritoxa are said to damage onions and others have been reared from decaying plant products.
FAMILY OTITID.E—THE PICTURED-WING FLIES

In the following key I have not followed the usual practice of recognizing the subfamilies, which Hendel has raised to family rank, for the very good reason that I do not believe the characters used are of much importance. The subfamily "Ortalinae" (the name Orталis is preoccupied in Ornithology and is not available) is distinguished by the presence of a propleural bristle, yet this is present, though less developed, in the Pterocallinæ, which is distinguished by its long stigmatic cell, a character which is also subject to variation. As in the Trupaneidæ several of the genera in this family have been based upon wing pattern. The characters at present in use are undoubtedly fairly stable but some of the generic characters are admittedly weak inasmuch as the differences in venation might easily be connected by the discovery of new forms. Hendel has published several papers dealing with the family and has treated all but the "Ortalinae" in Genera Insectorum (fascicles 96, 106, 113, 157).

The genus Otites was established by Latreille in 1804 (Nouv. Dict. d'Hist. Nat., xxiv, p. 196) and not in 1805 as given in catalogues. The type named was musca porcus, credited to Bose, but this species is the same as fӧrmosa Panzer. Platystomidæ cannot be used for the family name as Platystoma is preoccupied in Mollusca.

KEY TO GENERA*

<table>
<thead>
<tr>
<th>1. First vein bare</th>
<th>2</th>
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<tbody>
<tr>
<td>First vein with dorsal setulae at least on the apical third</td>
<td>34</td>
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</tbody>
</table>

2. Costa greatly weakened or broken at end of the auxiliary vein (Richardiae) | 3 |
| Costa not weakened or broken (Ulidinæ) | 17 |

3. Posterior femora with short spines below | 5 |
| Femora without spines below | 4 |

4. Head about twice as long as high (56) | Coniceps Læw |
| Head not as long as high (38, 92) | Epiplatea Læw |

5. Posterior femora swollen, much larger than the others; eyes sometimes stalked (14) | Richardia Desvoidy |
| Posterior femora not conspicuously swollen | 6 |

6. Anal vein reaching the wing margin, at least as a fold | 9 |
| Anal vein not nearly reaching the wing margin | 7 |

7. Occiput very strongly narrowed at the upper third (80, 97) | Odontomera Macquart |
| Occiput regular in outline | 8 |

* Pareuxesta Coquillett is omitted.
8. Occiput, from lateral view, strongly convex above the neck (21).
   
   Sepsisoma Johnson

   Occiput flat or slightly concave above the neck (1, 21).
   
   Macrostenomyia Hendel

9. Anterior crossvein situated farther from the posterior crossvein than
   the length of the latter
   
   Crossveins situated closer to each other than the length of the posterior
   crossvein (100)
   
   Hemixanthera Löw

10. Abdomen with almost parallel sides or coarctate basally

   Abdomen tapering to the base

11. Anterior crossvein situated before the middle of the discal cell (31, 68).

   Setelidia Hendel

   Anterior crossvein situated beyond the middle of the discal cell.

12. Anterior femora without spines beneath

   All the femora with spines beneath

   Paneryma Wulp

13. First antennal segment short

   First antennal segment as long as the second (49, 93)

14. Anterior crossvein situated at or before the middle of the discal cell;

   front concave above from anterior view (10, 73). Colomitopha Macquart

   Anterior crossvein situated well beyond the middle of the discal cell.

15. Two pairs of scutellars

   Only one pair of scutellars (63, 76, 98, 107)

   Melanoloma Löw

16. Front much wider than either eye (42, 105)

   Zetekomyia, n. g.

17. Antennae widely separated, situated in deep grooves, the face strongly

   convex in profile

   Ulidia Meigen

   Antennae not situated in deep grooves or the face not strongly convex

18. Anal vein absent or not extending beyond the anal cell

   Anal vein extending well beyond the anal cell

19. Anal cell absent, the wings very narrow (25, 36)

   Steneretma Löw

   Anal cell present (22, 45)

   Eumecosomyia Hendel

20. Front with large rather deep pits or with strong transverse ridges or

   grooves

   Front normal, sometimes with four longitudinal grooves above

21. Auxiliary vein forming a rather acute angle with the costa (19, 37).

   Acrosticta Löw

   Auxiliary vein forming an obtuse angle with the costa (30, 89)

   Notogramma Löw

22. Antennae as long as the head, the third segment four times as long as

   wide (51, 74)

   Stictomyia Bigot

   Antennae much shorter, the third segment never three times as long

23. Face convex in the middle in profile

   Face concave in profile
Otitidæ III.—31, Setellida coerulescens; 32, Setellia costalis; 33, Myennis; 34, Automola automaria; 35, Paredopa punctigera; 36, Steneretma; 37, Acadicta foveolata; 38, Epiplatea arcuata; 39, Amphicnephis pullus; 40, Pareuxesta latifasciata; 41, Xanthacrona bipustulata; 42, Zetekomyia banksi; 43, Stenomyia; 44, Axiologina ferrum-equinum; 45, Eumecosomyia gracilis; 46, Chrysomyza sinea.
24. Eyes conspicuously higher than long, the face gently concave above (35, 67) ........................................... Parapodopa Coquillett
Eyes about as long as high, the face not concave above (20, 69).
(Edopa Loew

25. Head not or scarcely longer than high .............................. 26
Head nearly twice as long as high (13, 18) .................. Eumetopiella Hendel

26. Third antennal segment with the apex rounded above .................. 27
Third antennal segment with the apex angulate above .............. 32

27. Anterior crossvein situated near or beyond the middle of the discal cell .................................................. 28
Anterior crossvein situated near the basal sixth of the discal cell (41, 82) ........................................... Axiologina Hendel

28. Mesopleura bare; two sternopleurals (84, 102) ............... Seioptera Kirby
Mesopleura haired; one sternopleural ................................. 29

29. Frontal vitta with hairs or bristles ................................. 30
Frontal vitta bare (27, 46) ..................................... Chrysomyza Fallen

30. Prescutellar acrosticals absent .................................. Zacompsia Coquillett
Prescutellar acrosticals present ................................... 31

31. Bristles arising from black spots (29) ............................. Euphara Loew
Frontals not arising from conspicuous black spots (94, 85); Euxesta Loew

32. Frontal vitta with at most two pairs of cruciate bristles or the face strongly receding .......................... 33
Frontal vitta with hairs or several bristles (64, 85) ............. Euxesta Loew

33. Face strongly receding (43, 104) .................................. Stenomyia Loew
Face perpendicular below (9, 83) .................................. Chaetopsis Loew

34. Costa fractured or greatly weakened at the end of the auxiliary vein .. 35
Costa entire ............................................................. 36

35. Abdomen petiolate (32, 72) ...................................... Setellia Desvoidy
Abdomen oval, not narrowed sub-basally ........................ Epipatea Loew

36. Propleural bristle weak or absent ................................ 37
Propleural bristle strong ............................................. 59

37. Three supra-alar bristles ........................................ 38
Four supra-alar bristles .............................................. Family Tanypezidae

38. Subcostal (stigmatal) cell usually extremely large; antennal grooves absent (Pterocallinae) ....................... 39
Subcostal cell usually normal; antennal grooves well developed, often deep (Platystominae auct.) ............... 48

39. Posterior crossvein more or less recurrent, never forming a sharp angle with the fourth vein .......................... 40
Posterior crossvein not recurrent, forming less than a right angle with the fourth vein .................................. 43

40. Anterior crossvein situated beyond the middle of the discal cell ...... 41
Anterior crossvein situated before the middle of the discal cell (58).
(Megalaemysia Hendel

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Otitidae IV.—47, Tritoxa flexa; 48, Himeroessa pretiosa; 49, Pectiomyia longicornis; 50, Ulidia apicalis; 51, Stictomyia punctata; 52, Dasymetopa stigma; 53, Califortalis hirsutifrons; 54, Ortalimyia aldrichi; 55, Delphina; 56, Coniceps niger; 57, Diacrita costatis; 58, Megaslaemya; 59, Melieria similis; 60, Califortalis hirsutifrons; 61, Tetanops luridipennis.
41. Tip of the anal cell extending beyond the apex of the second basal cell .................................................. 42
   Tip of the anal cell not produced beyond the apex of the second basal cell (28, 41) ........................................... Xanthacrona Wulp

42. Five pairs of dorsocentrals and acrosticals (17, 90). . Dysscrasia Aldrich
   Two pairs of dorsocentrals (33) ........................................... Myennis Desvoidy

43. Triangle of the anal cell almost as long as the basal section ........ 44
   Triangle much shorter than the basal part .......................... 45

44. Wings with parallel sides (11, 108) ............................... Pterocalla Rondani
   Wings widest sub-basally (99, 106) ............................... Callopistromyia Hendel

45. Anal cell convex apically, sometimes transverse on the posterior third,
   but never with a produced angle (23, 101) ........................ Paragorgopsis Giglio-Tos
   Anal cell at least somewhat produced posteriorly .................. 46

46. Second vein almost straight ........................................ 47
   Second vein strongly sinuous apically (91, 103) . Pseudopterocalla Hendel

47. Anterior crossvein situated at or before the middle of the discal cell (52, 87) ........................................... Dasymetopa Löew
   Anterior crossvein situated beyond the middle of the discal cell (7, 109) ........................................... Pseudotephritis Johnson

48. Occiput very broad and convex from lateral view ...................... 49
   Occiput narrow, usually flattened .................................. 52

49. Without sternopleurals (16, 75) .................................... Myrmecothea Hendel
   With one sternopleural .............................................. 50

50. Posterior crossvein situated more than its own length beyond the anterior crossvein (62, 79) .......................... Myrmecomya Desvoidy
   Posterior crossvein situated less than its length beyond the anterior crossvein ........................................... 51

51. Costal cell wide, convex anteriorly (3, 55) ........................ Delphinia Desvoidy
   Costal cell narrow, its anterior edge straight (47, 70) .......... Tritoxa Löew

52. Abdomen somewhat laterally compressed; one pair of weak frontal bristles above; third antennal segment elongate; arista bare (2).
   Senopterina Macquart
   Abdomen cylindrical or flattened, if slender the arista is plumose, the antennæ are short or there are two pairs of frontals ........... 53

53. Abdomen elongate, more or less cylindrical basally .................. 55
   Abdomen short and rather flattened ................................ 54

54. Costal cell widened, anal cell angled posteriorly (15).
   Ostracocœlia Giglio-Tos
   Costal cell normal; anal cell rounded posteriorly (39, 65).
   Amphicnephes Löew

55. Sternopleural bristle absent ........................................ 57
   Sternopleural bristle present ...................................... 56

56. Anal cell rounded apically (4, 71) ................................ Idana Löew
   Anal cell angulate posteriorly (57, 66) ................................ Diacrita Gerstaecker
Otitalidae V.—62, Myrmeomya; 63, Melanoloma affinis; 64, Euxesta mitis; 65, Amphicnephes; 66, Diacrita costalis; 67, Paredopa punctigera; 68, Setellida coeruleascens; 69, Odopa; 70, Trizioxa incurva; 71, Idana; 72, Setellia; 73, Coilmometopia; 74, Stictomyia; 75, Myrmecotheca.
57. Discal cell conspicuously widened before the anterior crossvein (5, 26). 
Rivellia Desvoidy
Discal cell not conspicuously widened, rarely widest at the middle..... 58

58. Anterior crossvein oblique, at the middle of the discal cell (48, 86).
Himeroessa Lœw
Anterior crossvein transverse, well beyond the middle of the discal cell ..........Acrostictella Hendel

59. Face sharply carinate.................................................. 60
Face not sharply carinate.............................................. 62

60. Third antennal segment angulate above or elongate.................. 61
Third antennal segment orbicular......................................Tetropismenus Lœw

61. Third antennal segment angulate at upper apex...........Tephronota Lœw
Third segment elongate..............................................Hiatus Cresson

62. Mesonotum with presutural bristles (12, 59). . . . Melieria Desvoidy
Mesonotum without presutural bristles.................................. 63

63. Front widening anteriorly.............................................. 64
Front narrowed anteriorly (34)........................................ Automola Lœw

64. Three or four pairs of scutellar bristles; postocellars long and fine; 
hair of front long and rather abundant (53, 60).........Califortalis, n. g.
Two pairs of scutellars; postocellars short; hair of front short, sparse 
and rather coarse...................................................... 65

65. Verticals long and strong; cheeks much narrower than the eye-height 
(Ortalis auct) ............................................................ 66
Verticals short; cheeks almost or quite as wide as the eye-height 
(6, 61).................................................................Tetanops Fallén

66. Two pairs of well developed frontals; lunule haired (77, 95).
Ceratoxys Rondani
Only one pair of well developed frontals; lunule bare (54, 94).
Ortalimyia, n. g.

Melanolomina, new genus

Differs from Melanoloma Loew in possessing two pairs of scutellar 
bristles. In the two species before me the mesonotum is more or less 
reddish and not metallic. Genotype:—Odontomera varians Schiner.

Zetekomyia, new genus

Differs from Melanolomina in having the front more than twice as 
wide as the eyes (from dorsal view) and a somewhat more elongate and 
more distinctly clavate abdomen. The head bears only four pairs of 
bristles: a pair of frontals, pair of ocellars, situated behind the anterior 
ocellus, and inner and outer verticals; hair very short; antennæ sepa-
Otitidae VI.—76, Melanoloma affinis; 77, Ceratoxys latiuscula; 78, Neoidiotypa appendiculata; 79, Myrmecomya; 80, Odontomera nitens; 81, Acrometopia (Chamaemyidae); 82, Axiologina ferrum-equinum; 83, Chaeotopsis aenea; 84, Seiotaera vibrans; 85, Euxesta annone; 86, Himeroessa pretiosa; 87, Dasymetopa; 88, Pareuxesta latifasciata; 89, Notogramma stigma; 90, Dyserasis; 91, Pseudopterocalla; 92, Epiplatea arcuata; 93, Poecilomyia longicornis.
Family Otitidae—The Pictured-Wing Flies

rated by a narrow carina, reaching to the oral margin, the third segment three times as long as wide; arista short plumose; facial grooves absent; two pairs of dorsocecntals; propleural and sternopleural bristles absent; scutellum with two pairs of bristles; posterior femora with bristles beneath; first vein bare above; anal cell rounded apically. Genotype:—Z. banksi, n. sp.

Califortalis, new genus

Related to Ceratoxys Rondani (Anacampta Læw) but readily distinguished by the presence of three or four pairs of marginal scutellars, a single, hair-like frontal and the very hairy front. The single species has somewhat the aspect of certain species of Tetanops Fallén but the bristles of the vertex are long and fine. Genotype:—C. hirsutifrons, n. sp., from California.

Ortalimyia, new genus

Related to Ceratoxys Rondani but the front bears only one pair of strong frontals and at most a very weak second pair, the head is longer, the facial carina higher, the face more retreating and the front narrower and less hairy. The bristles of the vertex are long and moderately strong. Genotype:—Ortalis snowi Cresson.

There has been much confusion concerning the identity of the genera mentioned in these notes. Ceratoxys differs from the other genera in the group by its conspicuously haired lunule. This leaves Califortalis, Tetanops and Ortalimyia and I think the characters in the key will serve to separate them. The front in Tetanops is always wrinkled or pitted and frequently pollinose except for the pits.
Family Trupaneidæ—The Fruit Flies

Mostly rather small flies, usually with pictured wings, the auxiliary vein curving forward at a right angle.

Head hemispherical, usually short; oral vibrissæ not distinct, the face vertical or somewhat retreating. Front broad, with bristles laterally, the anterior orbitals situated close to the orbits. Antennæ decumbent, short, rarely elongated. Probosces of moderate length, rarely elongate and with the labelleæ folding back, the labelleæ usually broad and fleshy. Thorax with bristles although the anterior ones may be absent. Legs of moderate length, the tibæ without preapical bristles. Wings large, usually with dark pattern, the auxiliary vein curving forward at right angles and sometimes evanescent at the tip; basal cells and anal cell always present, the latter often drawn out posteriorly into a long point or triangle. Abdomen composed of four or five segments; male genitalia small and only partly exposed; ovipositor segmented, usually exposed.

The adults are found in various habitats, often upon flowers. The larvæ live in the seeds and fruits of plants of various kinds or form galls. One of our commonest species lives in the heads of thistles, several make galls on golden rod, while others, like the fruit maggots, live in apples, cherries, citrus fruits, etc. Still others are leaf miners. The family is of considerable economic importance and has received a great deal of attention during recent years.

Among the papers essential to a study of the family are those listed below.* Other references will be found given in the key. Unfortunately the classification of this family is extremely artificial, being based largely upon the type of wing markings. In the key I have, in places, ignored the classification based upon wing maculation and a number of species must be shifted to genera in which they belong structurally, although differing to a certain degree, in wing pattern. Only the fact that I do not have access to all the North American genera prevents a more thorough revision of the genera. Recognition of many of the described species is difficult because they are not illustrated.

For many suggestions and the generous loan of material in this family I am greatly indebted to Mr. Marston Bates.

KEY TO GENERA*

1. Scutellum with six strong, regularly placed bristles............... 2
   Scutellum with not more than two pairs of bristles or they are weak
   and not regularly placed, the apical pair being very widely separated 4

2. Front more than half as wide as the head (1) ............... Xenochoæta Snow
   Front decidedly less than half as wide as the head ............... 3

3. Triangle of the anal cell longer than the petiole (46, 70).
   Blefaroneura Löew
   Triangle of the anal cell shorter than the petiole (2, 69). Hexachæta Loew

4. Scutellum with two pairs of bristles, the apical pair strong .... 5
   Scutellum with one pair of strong bristles or if with two pairs the
   apical pair is absent and there are two pairs on the basal half .... 36

5. Fourth vein not or scarcely curved forward at the apex ............ 6
   Fourth vein strongly curved forward at the apex (3, 9).
   Anastrepha Schiner

6. Anterior pair of dorsocentrals situated far in front of a line drawn
   between the anterior pair of supra-alars .......................... 24
   Anterior dorsocentrals situated at most slightly in front of such a line,
   usually behind ......................................................... 7

7. Proboscis very long and slender, geniculate; (Asimoneura Czerny;
   Rhyneina Johnson; Aleomyia Phillips) (4, 42) ...... Euribia Latreille
   Proboscis short and thick, not geniculate in the middle .......... 8

8. Arista short plumose or bare ........................................ 9
   Arista long plumose .................................................. 7
   Molynocælia Giglio-Tos

9. Scutellum not mostly shining black or the apex yellow or sulcate... 10
   Scutellum mostly shining black, the base narrowly yellow, the apex
   never sulcate (29, 66) ............................................. 28
   Ceratitis McLeay

10. Acrostical and dorsocentral bristles in an almost transverse row (5, 60).
    †Acidia Desvoidy
    Dorsocentrals placed far in front of the acrosticals so that there appear
    to be two pairs of dorsocentrals ................................... 11

11. Notopleura with several setulae near the posterior bristle (24, 63).
    Epochra Löew
    Notopleura bare ...................................................... 12

12. Cheeks at most slightly more than one-fourth as wide as the eye-
    height, if doubtful the scutellum is sulcate ........................ 13
    Cheeks at least two-fifths as wide as the eye-height; oral margin not
    strongly produced .................................................... 22

13. Stigmatal cell long and narrow, four times as long as wide; wings
    reticulate (21, 36) ................................................. 14
    Icterica Löew
    Stigmatal cell shorter and broader, not over three times as long as
    wide; wings not reticulate ........................................... 14
Trypaneidae II.—16, Eurostina confusa; 17, Tetreuaresta obscuriventris; 18, Xanthomyia platyptera; 19, Zonosema; 20, Trypeta fratia; 21, Icterica circinata; 22, Eucosmoptera tetraspina; 23, Terellia floriscintis; 24, Epochra canadensis; 25, Stenopa vulnerata; 26, Orellia; 27, 28, Myoleja cesio; 29, Ceratitis capitata.
14. Notopleura densely pollinose ....................................................... 20
   Notopleura not pollinose ............................................................... 15

15. Third antennal segment little longer than the basal two combined, never
    triangularly produced at the tip .................................................. 18
   Third antennal segment elongate, usually produced as a sharp triangle at
    the upper apex ........................................................................... 16

16. Postcallelar (postalar) bristle situated far in front of the posterior
    intra-alar ................................................. Zonosemata Benjamin
   Postcallelar, intra-alar and acrocostal bristles in almost straight line.... 16a

16a. Dorso-central bristles situated well behind the supra-alar bristles
    (19, 31) ................................................. Zonosema Læw
   Dorso-central bristles situated at most very slightly behind the supra-
    alars, usually slightly in front of them ........................................... 17

17. Third longitudinal vein with at most two basal setulae, usually bare;
    anterior crossvein situated but little beyond the middle of the discal
    cell (10, 43) ............................................................................. Rhagoletis Læw
   Third vein with several strong setulae on basal part; anterior crossvein
    situated well beyond the middle of the discal cell (Euleia Walker)
    (27, 28) ............................................................................. Myoleja Rondani

18. Scutellum swollen, convex, more or less deeply longitudinally grooved
    apically (Tomoplagina Curran) (58, 65) ...................................... Peronyma Læw
   Scutellum flat dorsally, not at all grooved ......................................... 19

19. Face more or less carinate, not concave in profile, the oral margin not
    produced (20, 19) .......................................................... Trypeta Meigen
   Face concave in profile, the oral margin produced (23, 62) .................

   Terellia Desvoidy

20. Costal spine not longer than the thickness of the costa; wings narrow. 21
   Costal spines more than twice as long as the costal thickness; wings
    very broad, reticulate (18, 37) .................................................. Xanthomyia Phillips

21. Wings reticulate; abdomen with paired shining black spots; oral mar-
    gin not produced (47, 53) ......................................................... Acidogona Læw
   Wings hyaline, rarely banded; abdomen without paired black spots;
   oral margin conspicuously produced (6, 34) ...................................... Neaspilota Osten Sacken

22. Scutellar bristles longer than the scutellum; antennal pits limited be-
    low, the head long ................................................................. 23
   Scutellar bristles very short; antennal pits almost obsolete; third an-
    tennal segment with several hairs above; tibiae swollen (10, 57) .........

   Pyrgotoides, n. g.

23. Fourth vein ending at or near the tip of the wing (7, 30) ..........

   Edicarena Snow

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† Euleia Walker is the older name but there is considerable doubt about the identity of the
  genotype and I use Myoleja to avoid confusion.

‡ Acidia fraeria Læw belongs here.


* A large species resembling the species of Pyrgota but distinguished by wing venation,
  presence of strong ocelli, shape of the head, etc. The genotype is crassipes n.sp. from Panama.
Trypaneidae III.—30, Edicarena diffusa; 31, Zonosema electa; 32, Tomoplaga; 33, Eutreta; 34, Neaspilota albidipennis; 35, Paracantha; 36, Icterica sericata; 37, Xanthomyia platyptera; 38, Stenopa vulnerata; 39, Eurostina confusa; 40, Pyrgotooides clavipes; 41, Polionota; 42, Euribia; 43, Rhagoletis cerasi; 44, Procercidochares.
Fourth vein ending behind the tip of the wing, the wing-apex near the third vein; wings rather pointed (8, 50, 51)........... Strausia Desvoidy

24. Anterior and posterior crossveins separated from each other by much less than half the length of the anterior crossvein; posterior crossvein very strongly recurrent (13).................. Polymorphomyia Snow Crossveins much less approximate; posterior crossvein not strongly recurrent .................................................. 25

25. Scutellum strongly shining black, swollen and hemispherical........ 26 Scutellum more or less dull, more or less flattened or at most moderately convex .................................................. 27

26. Parafacials bare (41, 79)...................... Procecidochares Hendel Parafacials with a row of rather long pale hairs (61)...... Callachna Aldrich

27. Notopleura cinereous pollinose........................................... 28 Notopleura bare or rather thinly brownish pollinose............. 31

28. Anal cell drawn out posteriorly into an elongate triangle.......... 29 Anal cell not drawn out apically, or with a short, transverse triangle (Euaresta Loew; Urophora Loew) (11, 12, 61)........... Tephritis Latreille

29. Antennal pits not deep, not separated and strongly marked........ 30 Antennal pits deep, separated and strongly defined (41, 48).

*Polionota Wulp

30. Face and front rather strongly narrowed to the antennae; oral margin with hair only on the anterior half (17, 51)........... Tetrearesta Hendel Face and front not strongly narrowed to the antennae; oral margin with bristles almost to the oral angles (45, 59)............. Acrotænia Loew

31. Anterior crossvein situated not more than its own length from the posterior, both strongly oblique (32, 72).................. Tomoplégia Coquillett Anterior crossvein situated more than its length from the posterior, both never strongly oblique........................................... 32

32. Stigmal cell scarcely longer than wide (25, 38).................. Stenopa Loew Stigmal cell usually twice as long as wide, always much longer...... 33

33. Front with two pairs of black reclinate bristles, none converging (35, 73)............................................... Paracanthia Coquillett Front with three pairs of convergent frontals.......................... 34

34. Costal spines short and not very conspicuous...................... 35 Costal spines rather long and conspicuous (15, 33)........... Eutreta Loew

35. Wings with crossbands (26).......................... Orellia Desvoidy Wings with a brown pattern containing hyaline indentations and spots (22).................................................. Eucosmoptera Phillips

* The single specimen I have before me is loaned by Dr. Aldrich and is determined as mucida Giglio-Tos. The figure by Giglio-Tos shows the anterior crossvein in the hyaline costal triangle and much farther from the posterior crossvein than I find it. The species I have illustrated may not be mucida, and may even belong to a different genus, depending upon the shape of the head. Mr. Van der Wulp's drawing is poor in regard to the anal cell.

† This genus is very doubtfully distinct from Acrotænia.

36. Front bristles well developed; ocellars present .................. 37
   Frontals weak; ocellars absent; ovipositor very long and cylindrical
   (14) ..................................................Toxotrypanea Gerstaecker
37. Head higher than long ........................................... 38
   Head longer than high (67) ..................................... 44
38. Scutellum without a deep longitudinal furrow .................... 39
   Scutellum swollen and with a deep longitudinal furrow (58, 63).

Peronyma Læw

39. Front immediately above the antennæ almost half as wide as the head
   and very much wider than either eye .......................... 40
   Front much less than half as wide as the head and, anteriorly, little
   if any wider than one eye from anterior view .................... 41
40. Anterior pair of dorsocentrals situated far in front of a line drawn
   between the anterior pair of supra-alar bristles (16, 39).

*Eurostina Curran
   Anterior pair of dorsocentrals situated at most slightly in front of a
   line drawn between the anterior supra-alar or behind such a line
   (55, 71) ..................................................Eurostina Læw

41. Front twice as long as the width at vertex (52, 74). Xanthaciura Hendel
   Front much less than twice as long as the width at vertex .......... 42
42. Front with at least three pairs of convergent frontal bristles .... 43
   Front with two pairs of convergent frontals (76) .................. 46

Eurostina Læw

43. Head almost as long as high, the oral margin projecting; eyes oblique,
   broadly oval (56, 75) ...........................................†Trypanea Schrank
   Head much higher than long, the oral margin but little projecting; eyes
   perpendicular, rather narrowly oval (68, 78) ........................‡Acirina Curran
44. Third antennal segment short, the apex rounded (Europe) (67).

Ensina Læw

3rd antennal segment rather long, the upper apex angulate (77).

Paroxyyna Hendel

The student will find it difficult to locate many species described in
genera other than those to which they are now assigned. In the following list
are given (1) the present genus and (2) in ( ) the genera in which species
may be found.

Acidia (Spilographa).
Dyseuaresta (Euaresta, Tephritis).
Ensina (Tephritis).
Enrihia (Aleomyia, Urophora, Tephritis Hendel, 1914).
Myoleja (Acirina, Acidia, Eucosmoptera).
Tephritis (Euaresta, Ensina, Trypanea, Urellia).
Terellia (Trypetta, Orellia).
Tetreuaresta (Euaresta, Tephritis).
Trypanea (Urellia, Tephritis).
Trypetta (Orellia, Terellia, etc.).
Zonosema (Spilographa, Acidia).

* Originally Eurostina latifrons Læw was named as type of this genus but the species is a
true Eurostina and does not possess the generic characters of Eurostina. The type of the genus
should be known as Eurostina confusa, Slosson Collection, Delaware Water Gap.
‡ Curran, 1932, Amer. Mus. Novit. No. 556. In a letter to the author Dr. Hendel sug-
gested the synonymy of this genus with Tephrella Bezzi and this is quite possible. However,
I am retaining Acirina on the suggestion of Mr. Bates, as a comparison of specimens with the
genotype of Tephrella, a little known species, may prove that two genera exist.
Trypanidae V.—57, Trypanoides clavipes; 58, Pyrgotoides clavipes; 59, Acrotaenia; 60, Acidia; 61, Callachna; 62, Terellia; 63, Epochra canadensis; 64, Tephritis; 65, Peronyma maculata; 66, Ceratitis capitata; 67, Paroxya; 68, Aciurina; 69, Hexacheta; 70, Blepharoneura (sp. Panama).
Mr. Bates has furnished the following list of species giving the correct generic position according to our present concepts:

Acidia johnsoni Thomas = Aciurina.
Aciura limata Coquillett (Eucosmoptera Phillips) = Myoleja.
Aciura nigricornis Doane (Eucosmoptera Phillips) = Myoleja.
Rhagoletis formosa Coquillett = Eriphia.
Rhagoletis grindeliana Coquillett = Eriphia.
Rhyneceina longirostris Johnson = Eriphia.
Trypeta baecharis Coquillett = probably Tephritis.
Trypeta bigeloviae Cockerell (Eurosta Townsend) = Aciurina.

Trypaneidae VI.—71, Eurosta; 72, Tomoplagnia; 73, Paracantha; 74, Xanthaciura insecta;
75, Trypaneus wheeleri; 76, Dyseuaresta plesia; 77, Ensina; 78, Aciurina trixa; 79, Procecidocharis.
Family Pallopteridae

Flies of medium size, usually with pictured wings, the auxiliary vein entire.

Head higher than long; oral vibrissæ absent; a single pair of frontal bristles; ocellars present; post-ocellarars parallel; face slightly receding; antennæ rather short, the third segment oval; arista short plumose or bare. Mesonotum bristled in front of the suture (except in two species); propleural bristle usually absent; one sternopleural bristle. Legs of moderate length; tibie without preapical bristle. Wings rather large; anal cell short, the anal vein extending to the wing margin; auxiliary vein free but ending close to the first vein, the costa weakened or broken at the point of union; apical cell not narrowed apically. Abdomen elongate oval, sub-cylindrical, the ovipositor flattened and elongate.

These flies are found in moist and shady places, usually upon foliage, and along the sea-shore.

Pallopteridae.—1, Palloptera arcuata; 2, 3, Omomyia hirsuta; 4, Palloptera jucunda.
*Palloptera* Fallén has been considered the only genus and has been reviewed by Malloch.* The genus has been placed in the Lauxaniidae and Lonchaeidae. It differs from the former in lacking preapical tibial bristles and from the latter in having the front transverse anteriorly, the lunule being concealed. In many respects it shows a relationship to the Helomyzidae but is excluded from the group by its flattened ovipositor and is, perhaps, more closely allied to the Otitidae. The genus *Omomyia*, placed in the Cælopidae by Coquillett, belongs here. It shows a remarkable sexual dimorphism, the males bearing long, woolly pile while the females show little trace of it.

**KEY TO GENERA**

1. Facial carina strong, the antennal grooves deep; males densely pilose
   (2, 3) .................................................... *Omomyia* Coquillett
   Facial carina quite weak; antennal grooves shallow; never densely pilose (1, 4) .................................................... *Palloptera* Fallén

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Family Lonchæidae

Small shining blackish flies, the auxiliary vein entire; the tibiae without preapical bristles.

Head shorter than high; face and front moderately wide; oral vibrisses absent; front with a single orbital, clothed with short hairs; ocellars present; postocellars divergent; antenna elongate, decumbent. Thorax bristled posteriorly; mesopleura with bristles behind; one or two sternopleurals; propleural present, the propleura without hair. Legs short; tibiae without preapical bristle. Wing venation complete; second basal and anal cells short, the anal vein reaching the wing margin faintly, and bisinuate. Abdomen oval, rather flat; ovipositor rather long and triangular.

The adults occur almost everywhere but prefer moist or shady places. The larvae live in plants or decaying vegetation. They have been reared from under bark and may be predaceous.

This family is readily distinguished from the Periscelidae by its entire auxiliary vein; from the Sapromyzidae by the absence of preapical tibial bristles on at least the anterior and posterior tibiae and from the Pallopteridae by the presence of a propleural bristle and the exposed frontal lunule.

Lonchaea Fallén is the only genus recognized although Earomyia Zetterstedt may be distinguished by having the frontal lunule bare. Malloch* has reviewed the species. A few have been described since the publication of his paper.

Family Ropalomeridæ

Moderately large tropical flies of a brownish and grayish color.
Front broad, excavated, with or without bristles; face broad, carinate, tuberulent or the oral margin prominent; cheeks broad, hairy; clypeus projecting; oral vibrissæ absent; proboscis short, the palpi slender or dilated; antennæ short; arista dorsal, bare or plumose. Thorax elongate; mesonotum with but few bristles, usually more or less mottled with gray and brown; scutellum often prominent and grooved. Abdomen shorter than the wings, flattened; hypopygium moderately large, largely concealed; ovipositor telescopic, projecting. Femora all

Ropalomeridæ.—1, Willistoniella; 2, 3, Ropalomera; 4, Willistoniella; 5, Apophorhynchus.
thickened; posterior tibiae often dilated. Apical cell narrowed apically; auxiliary vein absent or present; second basal and anal cells present.

Only about a dozen species are known, all occurring in Central or South America. Evidently they are not uncommon at certain seasons of the year as Mr. Banks secured a number of specimens in Panama during July and August although I saw only two from December to March. They are evidently seashore inhabitants which extend their range up the rivers. The adults are fast in flight and are excellent hoverers. There is a recent revision of the family by Lindner.®

KEY TO GENERA

1. Auxiliary vein present ................................. 2
   Auxiliary vein absent.............................................. *Rhinotora* Schiner

2. Scutellum oval ................................. 3
   Scutellum pyramidal, directed obliquely upward; arista plumose or bare
   (2, 3) ......................................................... *Ropalomera* Wiedemann

3. Arista plumose .................................................. 4
   Arista bare ..................................................... *Kröberia* Lindner

4. Face tuberculate; frontal bristles absent (5)...... *Apophorhynchus* Williston
   Face carinate; frontals present (1, 4) ................. *Willistoniella* Mik

Family Tanypezidæ

Tanypeza, head and wing.

Medium sized flies, with rather long, slender legs.

Head higher than long; face retreating below; two pairs of frontals: ocellars procline; antennæ pendulous, the third segment oval, moderately large; oral vibrissæ absent; palpi broadened. Thorax with only one pair of dorsocentrals; one humeral; no sternopleurals, one or two bristles on the mesopleura above, the mesopleura and pteropleura haired. Legs long, slender, without bristles. Wings with the apical cell narrowed; anal cell rounded apically, about as long as the second basal; first vein setulose above; auxiliary vein entire, touching the first vein before its end.

The adults occur in moist woods and are by no means numerous in collections. The immature stages are unknown.

Tanypeza Fallén is the only known genus unless Tetradiscus Bigot is distinct. However, Tetradiscus may not belong to this family and is too poorly described to be recognizable. There are fewer than a dozen known species belonging to the family, most of them occurring in the Neotropical region while one is known from Europe.
Family Calobatidae—The Stilt-legged Flies

Calobata univittata.

Elongate flies with very long legs and dorsal, bare to plumose arista.

Head higher than long, rather orbicular or elongate, the front wide in both sexes and usually with bristles; face usually receding, the oral margin more or less produced, the clypeus large and polished; palpi flat and broad; antennae of moderate length, pendulous, with dorsal, bare to plumose arista. Thorax elongate, bristled posteriorly and on the sides; sternopleura with long bristly hair behind; true sternopleural bristles absent; pteropleura bare. Legs very long, the anterior pair widely separated from the middle pair, femora rarely with small bristles, the posterior four tibiae usually with tiny bristles. Wings long, usually marked with brown or black, the anal cell rectangular or angulate apically; apical cell usually narrowed apically; auxiliary vein lying very close to the first vein and usually partly touching it, rarely ending well before the first vein. Abdomen long and narrow, the ovipositor long.

The adults are found near moist places in the Neartic region but seem to occur everywhere in the tropics, where they are scavengers, and evidently the larvae live in excrement. Some species have been reared from excrement and the adults are attracted to it in very large numbers. However, I have found a few of the tropical species only on foliage near streams and these may have a different habit. Enderlein* has reviewed the group and Cresson has described many species.

* 1922, Arch. für Naturg., Ixxviii, Abt. 5, pp. 140-229.
As here understood this family comprises the genera *Calobata*, and *Cardiacephala* of the old family Mieropezidae. They really have little in common with this latter group except a superficial resemblance. The classification of the family is poor and several of the genera are based upon what appear to be trivial characters. Several of the genera occurring in South America, as well as a few included in the following key, are unknown to me so I am unable to do more than use the characters cited by their describers although I think that most of the genera are well founded and could be readily recognized upon characters other than those used. The genus *Cardiacephala* Schiner, of which I consider both *Plocoscelus* Enderlein and *Rhacius* Enderlein to be synonyms, merely displays a diversity in head shape not found in other groups, but no sharp lines can be drawn between the three proposed genera. Some insects show specialization along one line, others in other ways.

FAMILY CALOBATIDÆ—THE STILT-LEGGED FLIES

KEY TO GENERA

1. Anal cell extending two-thirds the distance to the wing margin, its anterior edge very oblique (16) .................................................. 2
   Anal cell much shorter, the crossvein much less oblique .................. 5

2. Distance between the tips of the second and third veins more than half as great as the length of the ultimate section of the fourth vein (16) .................................................. 3
   This distance less than half the length of the ultimate section of the fourth vein (1, 10) .................................................. Parasphen Enderlein

3. Arista bare ............................................................................ 4
   Arista plumose or long pubescent (2, 19) ......................... Ptilosphen Enderlein

4. Apical cell closed and short petiolate (12, 16) ....... Taniaptera Macquart
   Apical cell open (7, 15) .................................................. Grallomya Rondani

5. Arista bare ............................................................................ 6
   Arista plumose ........................................................................ 9

6. Distance between the tips of the second and third veins equal to less than half the length of the ultimate section of the fourth vein (4, 9) .................................................. Scipopus Enderlein
   This distance greater than half the length of the ultimate section of the fourth vein .................................................................. 7

7. Postocellar bristles absent (8, 14) ......................... Hoplocheiloma Cresson
   Postocellar bristles present, vertex with six bristles ............... 8

8. Occiput strongly produced on either side of the vertex, concave in the middle from dorsal view ........................................... Mitromyia Cresson
   Occiput at most weakly produced and very greatly concave from dorsal view (3, 18) .................................................. *Rainieria Rondani

9. Posterior femora very conspicuously swollen on the apical third (6, 13, 21) .................................................. †Cardiacephala Schiner
   Posterior femora regular in outline .......................................... 10

10. Postocellar bristles absent .................................................. 11
    Postocellar bristles long and strong (5, 17) ..................... Grallipeza Rondani

11. Stigmal cell long, the first vein ending in front of the anterior crossvein ........................................... Calobatina Enderlein
    Stigmal cell short and not distinct, the first vein ending well before the anterior crossvein (11, 20) ...................................... Calobata Meigen

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* Tanypoda Rondani is a synonym and I do not believe that the characters cited by Cresson for his genus Meganeria are of sufficient value to constitute a genus.
† The dorsal view of the head shows the extreme development of the lobe-like production of the posterior orbits which may not be produced beyond the vertex. Rhuecinus (Enderlein) has been proposed for this latter group but there is every gradation between the two extremes.
Family *Micropezidae*

Slender flies of moderate size, their legs long, the second basal cell united with the discal cell.

Head orbicular or elongate and subtriangular; front without bristles; face receding, without oral vibrissæ; antennæ short, the arista dorsal. Thorax elongate, the front and middle coxae widely separated; posterior portion of the pteropleura with long hairs; one sternopleural bristle. Legs long and slender, the tibiae with bristles. Wings long, the second basal cell united with the discal cell; apical cell narrowed or closed and petiolate apically; auxiliary vein not distinctly separated from the first vein. Abdomen long and slender, the female ovipositor large, pendulous; male genitalia rather small, the fifth sternite usually with long pendulous lobes.

The adults are found in marshes and moist places in woods. There are three or four Neartic, one Palaearctic and many species in the American tropics. I have seen only *Micropeza* from the United States and Canada. The immature stages are unknown. Enderlein* has reviewed the family. I give the characters of his genera although I scarcely agree that there are four genera represented. The appendicular apical cell does not seem to me to be of generic importance and I am inclined to recognize only *Micropeza* and *Metopobrachia*.


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*Enderlein*
KEY TO GENERA

1. Head subtriangular, much longer than high. .......................... 2
   Head orbicular, but little longer than high. .......................... 3

2. Apical cell open or closed in the wing margin (1, 2) . . . . . . . . . . Micropeza Meigen
   Apical cell closed and petiolate ................................ Nerioccephalus Enderlein

3. Apical cell open (3, 4) .............................................. Metopobrachia Enderlein
   Apical cell closed and petiolate ................................... Cliopeza Enderlein

* 1922, Arch. für Naturg., lxxxviii. Abt. 5, pp. 140-229.
Family Neriidæ

Slender flies of moderate size, with long legs and an apical arista. Head longer than wide; two pairs of frontal bristles, the front wide in both sexes; face receding,* without oral vibrissæ; antennæ porrect, with a terminal bare or pubescent arista. Thorax long, the front and middle legs widely separated, the prosternum as long as the mesosternum; pteropleura bare; with or without a sternopleural bristle. Legs long and slender, the femora with short spines beneath. Wings long, the apical cell usually narrowed apically; anal and second basal cells short; auxiliary vein ending in the first vein. Abdomen long, rather flattened above; ovipositor long and pendulous, carried under the abdomen in life.

The adults are found near water or moist places. The family is strictly tropical, four of the nineteen genera occurring in North America. The immature stages are not known. Enderlein† has reviewed the group.

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* In the old world Telostylinae the oral margin is prominent while in the Neriinae it is not conspicuous.
† 1922, Arch. für Naturk., lxxxviii, Abt. 5, pp. 140-229.

Neriidæ.—1, 2, Nerius; 3, 4, Dictyonerius.
FAMILY NERIHID.E

KEY TO GENERA

1. Wings with numerous crossveins (3, 4) .......... Dictyonerius Enderlein
   Wings with normal venation ................................. 2

2. Third antennal segment pointed apically; scutellum with one pair of
   bristles .................................................... Glyphidops Enderlein
   Third antennal segment rounded or obtuse apically ................. 3

3. Ventral surface of the anterior femora with setigerous tubercles on
   the whole length ............................................. Odontoloxozus Enderlein
   Anterior femora with bristles only apically (1, 2) ........ Nerius Fabricius
Family Piophilidae

Piophila casei.

The flies included in this family rarely exceed five millimeters in length, and are usually glistening black or slightly bluish metallic in lustre.

Face not carinate, occiput more or less flattened; always two pairs of vertical bristles; postvertical bristles divergent; fronto-orbital bristles varying from two pairs to none; antennae decumbent, the third segment elongate oval, arista bare in the American species; cheeks rarely fringed with hairs, the oral vibrissæ usually prominent, parafacials not differentiated as a linear orbital boundary; palpi well developed. Mesonotum almost always finely pubescent and polished; sternopleura never pruinose; one pair of dorsocentral bristles, four scutellar bristles. Legs of the male never toothed or deformed, the front femora usually furnished with long but delicate bristles. Abdomen more or less polished, pubescent but without bristles, broad, depressed, not constricted at the base; genitalia of the male more or less hidden asymmetrical; ovipositor extensile. Auxiliary vein terminating close to the end of the first vein, the costa broken at or near the termination, third and fourth veins parallel or more or less diverging, anal vein usually curved and evanescent apically, discal cell usually large, with the posterior crossvein usually long.

The larvae are, in general, scavengers but some of them live in cheese and preserved meats. *Piophila casei*, the cheese-skipper, has a rather conical larva, pointed anteriorly and truncate posteriorly; body shining and smooth; antennæ two segmented; mouth hooks separated and divergent; anterior spiracles whitish, the abdominal travelling
folds roughened, the posterior segment with four fleshy protuberances. The larva jumps by grasping the edge of the posterior truncature of the body with its mouth hooks and suddenly releasing it. The puparium is rugose and elliptic.

The members of this family have been placed in the Sepsidae by most authors. The family differs from the Sepsidae in several characters, particularly in having the costa broken at the end of the auxiliary vein, setulose mesonotum and the absence of a hair or fine bristle arising on the posterior edge of the posterior spiracle of the thorax. Melander* has reviewed the family.

KEY TO GENERA

1. One or two pairs of frontal bristles........................................ 2
   No frontal bristles; face strongly receding; antennae variable in length
   (3) .................................................... Prochyliza Walker

2. Two pairs of dorsocentral bristles........................................ 3
   One pair of dorsocentral bristles (1, 2 and text fig.)............. Piophila Fallén

3. One pair of frontal bristles (text fig.)............ Amphipogon Wahlberg
   Two pairs of frontal bristles........................................ Mycetaulus Læw

* 1924. Psyche, xxxi, pp. 78-86.
Family *Sepsidae*

Small, shining black or reddish flies.

Head more or less spherical, the occiput usually quite convex, face carinate; one or two pairs of vertical bristles, one or no orbitals, post-vertical bristles divergent; antennae decumbent, the third segment oval, the arista usually bare; parafacialis very narrow, reduced to an orbital line; palpi vestigial. Mesonotum usually aciculate or pollinose and not pubescent, its setulae usually in three longitudinal rows; scutellar bristles usually two, rarely four in number; either one or two pairs of dorsocentral bristles; sternopleura usually in part or entirely pruinose. Auxiliary vein curving so as to terminate obviously before the end of the first longitudinal vein, costa not broken, the third and fourth veins more or less converging; anal vein straight and abbreviated. Legs of the male usually deformed and armed with spines or thorn-like projections, usually located on the front pair. Abdomen with but sparse pubescence or fine setulae, often constricted at the second segment and bearing a few bristles; male genitalia usually prominent, symmetrical, comprising a hypopygium with paired lateral valves, each tipped by a prong or flat
blade of distinctive structure; ovipositor not extended, the female abdomen with bluntly rounded termination.

The adults are found about excrement, carrion and decaying vegetation, in which the larve live, and many of the species are very common. There are between forty and fifty described species from North America. Melander and Spuler* and Dudat† have dealt with the species.

**KEY TO GENERA**

1. First and second basal cells separated. ................................. 2
   First and second basal cells united (3, 5) .........................Pandora Haliday

2. Outer verticals present....................................................... 3
   Outer verticals absent..................................................... 5

3. Anterior femora of both sexes with a close-set row of spinules ventrally, never with stout spines or thorns (4, 6) ....Nemopoda Desvoidy
   Anterior femora never with such a row of spinules, often with coarse spines, sparse hairs or more or less deformed....................... 4

4. No frontal bristles (7, 8, 9) ..............................................‡Sepsis Fallén
   One frontal bristle; anterior femora never tuberculate.
   Meroplius Rondani

5. Postocellar bristles long and strong; one frontal (1, 2) .Themira Desvoidy
   Postocellars very weak; frontals not developed ............Enicita Westwood

‡ The genus Sepsidimorpha Frey I cannot separate from Sepsis and I do not consider the absence of tubercles on the anterior femora of generic importance. Those species of Sepsis which have a frontal bristle I would place in Meroplius even though the front femora are armed beneath.
Family Lauxaniidae

Rather small flies, rarely more than 6 mm. in length, the auxiliary vein entire and ending in the costa.

Head variable, the face projecting or retreating, convex, flat or concave, without oral vibrissæ although these are rarely poorly developed. Front wide, with two pairs of frontals, the upper pair always reclinate, the lower pair sometimes decussate; ocellars present or minute. Antennæ variable, the arista plumose to bare. Thorax with bristles, at least behind the suture; scutellum usually bare except for the marginal bristles; propleural bristle present or absent; one or two sterno-pleurals. Tibiae all with preapical bristle. Wing venation complete, the second basal and anal cells short; apical cell usually widely open. Abdomen oval, rarely elongate.

The adults may be found almost everywhere, but particularly in moist places where they may occur in large numbers. Many of the species are more in evidence in the evening than during the rest of the day. They are not very active and are therefore easily captured.

The larvae of at least some of the species mine in plants and are economically important; others live upon decaying vegetation.

Sapromyzidae has been used for this family by most American authors but Lauxania is older and should be used. Hendel has published extensively on the family; many changes have been made since his contribution in Genera Insectorum* and he recognizes many additional genera in his key to genera.†

* 1908, Fascicle No. 68.
† 1925, Encycl. Ent., B. Dipt., pp. 103-142.
Lauxaniæ I.—1, Chaetocelia sp.; 2, Physegenua vittata; 3, Chaetominettia latelimbata; 4, Homoneura philadelphica; 5, Pseudogriphoneura; 6, Neogriphoneura; 7, Camptoprosopella vulgaris; 8, Lauxaniella opaca; 9, Steganolauxania latipennis; 10, Deutominettia bimacula.
KEY TO GENERA

1. Antennæ long and slender, the first segment two-thirds as long as the second and with apical hairs below. ........................................ 2
   Antennæ not unusually elongate, the third segment usually more or less oval, rarely twice as long as wide, the first short or without bristles below .................................................. 7

2. Sternopleura with a single bristle. ........................................... 3
   Two sternopleural bristles (17, 18) .................................. Lauxania Latreille

3. Propleural bristle present ................................................. 4
   Propleural bristle absent (23, 26) .................................. Asilostoma Hendel

4. Anterior pair of frontals decussate; face with transverse striae (9, 22).
   Anterior pair of frontals reclinate .................................. 5

5. Submarginal cell but little wider than the marginal (8) ............... 6
   Submarginal cell more than twice as wide as the marginal.
   Steganopsis de Meijere

6. Face with a large, rounded convexity on either side .... Cephalella Malloch
   Face without such swellings (8, 21) .................................. Lauxaniella Malloch

7. Third vein setulose either above or below ................................ 8
   Third vein bare .................................................................. 10

8. First vein setulose above ..................................................... Dryomyzothea Hendel
   First vein bare .................................................................. 9

Lauxaniidae III.—18, Lauxania cylindricornis; 19, Trigonometopus vittatus; 20, Camptoprosopella vulgaris; 21, Lauxaniella opaca; 22, Steganolauxania latipennis; 23, Asilostoma; 24, Griphoneura; 25, Freyia nigrita; 26, Asilostoma palpalis; 27, Neominettia contigua.
9. Third vein setulose below to beyond the anterior crossvein (27).
   Neominettia Hendel
   Third vein setulose above and below before the anterior crossvein (3, 31).............. Chaetominettia Malloch

10. Second vein setulose before the origin of the third vein (30, 34).
    *Xenochjetina Malloch
    Second vein bare........................................... 11

11. First vein setulose posteriorly before the humeral crossvein (28, 36).
    Setulina Malloch
    First vein bare........................................... 12

12. Wings with a crossvein dividing the apical cell beyond the posterior crossvein (11)........ Xenopterella Malloch
    Wings with only the usual crossveins.......................... 13

13. Anterior frontal bristle directed inward; first antennal segment as long as the second........ 14
    Anterior frontals reclinate; first antennal segment short........... 17

14. Ocellar bristles minute........................................... 15
    Ocellars long and strong.................................... 16

15. Face concave in profile........................................ Freyia Malloch
    Face convex (2, 16)........................................... Physegena Macquart

16. Face strongly convex; anterior frontals half way between the antennae and upper frontals (12)........... Pachycerina Macquart
    Face gently convex or plane; anterior frontals closer to upper frontals than to antennae (7, 20)........... Camptoprosopella Hendel

17. First antennal segment as long as the second (25)........... Freyia Malloch
    First antennal segment short.................................. 18

18. Presutural bristle present........................................... 19
    Presutural bristle absent; face strongly retreating (19, 33).
    †Trigonometopus Macquart

19. Apical cell very strongly narrowed apically, almost closed (13, 21).
    Griphoneura Schiner
    Apical cell widely open...................................... 20

20. Sternopleura with one bristle.................................... 21
    Sternopleura with two bristles, the anterior one weaker........... 22

21. Front much broader than long, concave in front from dorsal view (6, 35).............. Neogriphoneura Malloch
    Front rarely broader than long, not concave in front (5, 38).
    ‡Pseudogriphoneura Hendel

22. Face convex and glossy (29, 37)......................... Pseudocalliope Malloch
    Face gently convex or flat, not polished.......................... 23
23. Intra-alar bristle present ................................................. 24
   Intra-alar bristle absent .............................................. 26

24. Scutellum bare above .................................................. 25
   Scutellum setulose above (10) .................................. Deutominentia Hendel

25. Frontal bristles arising from tubercles (1, 32) .......... Chaetocelia Giglio-Tos
   Frontal bristles not arising from tubercles (14) .......... Minettia Desvoidy

26. Second vein undulated ............................................... Trypetisoma Malloch
   Second vein not undulate .......................................... 27

27. The tiny black costal setulae continued to the apex of the third vein (4).
   Homoneura Wulp
   The black setulae extend to only a little beyond the apex of the second
   vein, never to the third (15, 39) .............................. Sapromyza Fallén

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* Hendel has recognized two segregates of this genus, Lycia Desvoidy and Cnemacantha
  Macquart, both of which have four dorsocentral bristles. The former has the acrostical hairs
  two or four rowed and rather long while the latter has them six rowed and very short.
Periscelidae.—1, Marbenia peculiaris; 2, Neoscutops rotundipennis; 3, Scutops fascipennis; 4, Neoscutops rotundipennis; 5, Scutops fascipennis; 6, Panamenia chapmani; 7, Marbenia peculiaris; 8, Sphyroperiscelis sp.; 9, Panamenia chapmani; 10, Sphyroperiscelis sp.
Family Periscelidae

Small flies resembling the Lauxaniidae, etc.

Face wide, more or less produced below; front with a single pair of bristles; postocellars divergent; arista plumose. Wing venation complete, the auxiliary vein short. Abdomen oval, somewhat depressed.

Members of this family are not numerous in collections and little is known about them. Malloch would retain the genera in the Sapromyzidae and Melander included Scutops in his revision of the Geomyzidae. The family contains seven genera, all occurring in America, Periscelis also being found in Europe.

KEY TO GENERA

1. Costa extending to the fourth vein............................... 2
   Costa ending at the third vein.................................. 5
2. Face very strongly protruding below; auxiliary vein not curved forward apically ......................................................... 3
   Face somewhat protruding below; auxiliary vein with a distinct forward curve apically; oral vibrisses absent ......................... Periscelis Loew
3. Face evenly convex.................................................... 4
   Face flattened and bare in the middle above (3, 5).............. Scutops Coquillett
4. Ocellars absent....................................................... Cyamops Melander
   Ocellars long and strong (21)..................................... Neoseutops Malloch
5. Face most prominent below; veins strong (6, 9) .................. Panamenia, n. g.
   Face not prominent below, more or less convex in the middle........ 6
6. Head almost or quite twice as wide as high; face very wide (8, 10).
   Sphyroperiscelis Sturtevant
   Head not nearly so wide; face and eyes of moderate width (1, 7).
   Marbenia Malloch

Panamenia, new genus

This genus is, perhaps, most closely related to Sphyroperiscelis Sturtevant but the shape of the head is distinctive. The face is shield-shaped, the point below, the sides sharply limited and haired. Abdomen as broad as long, tapering sharply from near the base. Scutellum flat, bearing two pairs of marginals. Wings as in figure. Genotype:—P. chapmani, n. sp.

Head stramineous, the upper occiput and a broad frontal triangle black; thorax deep brown or blackish, the pleura yellowish; humeri, a large rectangle on the posterior half of the mesonotum and the scutellum, except the sides, stramineous; legs reddish yellow, the tibiae with two brown bands, the anterior femora brown basally; wings brownish, with a preapical hyaline band; abdomen blackish or dark brown. Male, Barro Colorado Island, Canal Zone, (Curran).
Family Drosophilidae—The Small Fruit Flies

Small flies, rarely exceeding a length of 5 mm. the head sometimes very broad, the wings often pictured.

Face nearly vertical in profile, rarely prominent, oral vibrissae present, though sometimes weak; front with three pairs of bristles; postocular bristles convergent, rarely absent. Third antennal segment oval or rounded, the basal two short; arista usually plumose, rarely pubescent or with a single long ray. Abdomen usually short, rather elongate and pendulous in Curtonotum. Auxiliary vein usually very short and ending in the first vein; costa broken twice; first vein short; second basal cell usually united with the discal cell; anal cell present, rarely incomplete.

The adults are found around decaying vegetation, flowing sap, fungi and ripe fruit, the larvae being found in these substances. They are often pests to the housewife, since they apparently appear from nowhere when fruit is brought into the house and some of the fungus inhabiting species have the habit of hovering around the eyes during warm weather, causing not only irritation by their antics but pain when they get into the eye. In the tropics they sometimes occur in such numbers as to completely cover large fungi. There have been frequent complaints about them in milk bottles, the puparia becoming attached to the bottles and requiring special treatment for their removal.

One of the species, Drosophila melanogaster Meigen, has been used extensively for the study of inheritance, being exceedingly well suited for this purpose because of the very short life cycle and large chromosomes. The general belief has been that the larvae live upon fruit but it has been shown that they actually live upon the yeasts developing in it.

Sturtevant* has reviewed the North American species and Duda‡ has dealt with the Neotropical forms. In addition there are numerous small papers scattered through the literature. In addition to the genera given in the key several others, as well as a number of subgenera, have been proposed but most of them appear to be too poorly differentiated to deserve recognition. Aldrich* has discussed the occurrence in North America of the genus Leiomyza Macquart and described two species. As I have no specimens I am unable to place the genus in the key. Sturtevant* has referred this genus to the Asteidae but this disposition of it does not agree with my interpretation of that family.

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‡1927. Die Sudamerikanischen Drosophiliden, etc., Arch für Naturgeschichte, 1925, Heft 11-12, pp. 1-229.
KEY TO GENERA

1. Discal and second basal cells united (18) ........................................ 2
   Discal and second basal cells separated (17) .................................. 14
2. Auxiliary vein ending in the first vein near its base ...................... 4
   Auxiliary vein entire or nearly so ............................................ 3
3. Arista plumose; prescutellar acrosticals strong; costa pectinate (23, 24) Curtonotum Macquart
   Arista pubescent; prescutellar acrosticals absent .Aulacigaster Macquart
4. Arista pubescent or bare with one long ray above ......................... 5
   Arista plumose ........................................................................ 6
5. Arista with one long ray above (1, 13) ....................... Cladochæta Coquillett
   Arista pubescent ................................................................. 7
6. Proboscis longer than head-height; head broader than the thorax (6, 9, 18) .Zygothrica Wiedemann
   Proboscis shorter than the head; head rarely broader than the thorax. 7
7. Lower reclinate frontal bristle as far from the procline as from the upper reclinate ........................................ 8
   Lower reclinate frontal situated nearer to the procline than to the upper reclinate ............................................. 10
8. Prescutellar acrosticals strong; face not protuberant ...................... 9
   Prescutellar acrosticals weak or absent; face produced. .Pararhinoleucophenga Duda
9. Costa ending at the third vein (3, 15) ..................... Leucophenga Mik
   Costa extending to the fourth vein (2, 12) .Rhinoleucophenga Hendel
10. Lower reclinate frontal situated in front of the procline (5, 27) .Chymomyza Czerny
    Lower reclinate situated behind the procline ................................ 11
11. One large pair of dorsocentrals; mesonotum and scutellum usually convex; a single bristle at the second costal break (11, 19). .Mycodrosophila Oldenberg
    Usually two pairs of dorsocentrals ........................................... 12
12. Acrostical hairs moderately long and not very numerous, never in more than four rows anteriorly (10, 25) .Scaptomyza Hardy
    Acrostical hairs short and appressed, always in six or more rows anteriorly ......................................................... 13
13. Prescutellars long and strong .Clastopteromyia Malloch & McAtee
    Prescutellar acrosticals quite weak or absent (4, 16) .Drosophila Fallén
14. Arista pubescent or bare ......................................................... 17
15. Propleural bristle present but weak (8, 17) .Diaistata Meigen
    Propleural bristle absent ....................................................... 16
16. Face flat on upper half, prominent in the middle (7, 26). .Planinasus Cresson
    Face concave, the oral margin the most prominent (14, 21). .Stegana Meigen
17. Antennæ extending to the oral margin, the third segment twice as long as wide .Trypтоchæta Rondani
    Antennæ not reaching the oral margin (20, 22) .Sinophthalmus Coquillett
Family Asteiidae

Small flies, with the second vein ending only slightly beyond the first.

Head higher than long; face concave; oral vibrissae well developed; front wide, with one or two pairs of bristles; thorax bristled posteriorly. Legs short. Wings long, with only one or two crossveins, before the basal third; auxiliary vein incomplete; costa entire, anal cell absent, the second basal sometimes open apically. Abdomen narrow.

This family comprises but few genera, three of which are recorded from America. The family may be at once recognized by the peculiar wing venation. Williston placed the two genera known to him in both the Drosophilidae and Chloropidae and there has been much doubt as to where they belong.

KEY TO GENERA

1. Posterior crossvein present .................................................... 2
   Posterior crossvein absent, only one crossvein (3) ............. *Asteia Meigen

2. Front with two bristles near the middle, half way between the ocellar triangle and antennae ....................... Crepidohamma Enderlein
   Front with only weak bristles laterally (1, 2) ............ Sigaloessa Coquillett

* Aldrich, 1915, Psyche, xxii, p. 96.

Asteiidae.—1, 2, Sigaloessa rica (insularis Curran, not Malloch); 3, Asteia sp.
Family Opomyzidae

Small, rather elongate flies, sometimes with pictured wings.

Head not longer than high, the face long, often narrow; one or more pairs of frontal bristles; postocellar bristles divergent, convergent, or absent; oral vibrissae absent or differentiated, never strong; palpi small. Presutural dorsocentrals present or absent; mesopleura bare; scutellum with or without hair in addition to the bristles; preapical tibial bristles absent. Subcosta incomplete or vestigial; anal and second basal cells complete, the first vein ending before the middle of the wing. Abdomen moderately long, the segments with marginal bristles; genitalia small.

Various authors have recognized three families for this group, the Anthomyzidae and Tethinidae in addition to the Opomyzidae or Geomyzidae. Despite the differences I believe that the genera should be grouped together, as otherwise there is sufficient grounds for the creation of a family for each of the genera. At any rate we may safely unite the Anthomyzidae and Tethinidae since both groups possess oral vibrissae. However the vibrissae are weak and the characters by which these groups are separated from Opomyza do not appear to be important in this case.

The flies occur chiefly in moist places and along the seashore. Practically nothing is known about the life histories, but it is known that species of Opomyza live in grass.

KEY TO GENERA

1. Oral vibrissae differentiated; postocellar bristles converging, though small
   Oral vibrissae absent; postocellar bristles diverging or absent

2. Presutural dorsocentrals present
   Presutural dorsocentrals absent

3. Cheeks haired only along the lateral oral margin
   Cheeks with hairs over much of the surface or at least toward the eyes

4. One pair of strong frontals (4, 7)
   Two pairs of strong frontals

5. Posterior crossvein situated only about its length from the wing margin
   Posterior crossvein situated almost twice its length from the wing margin

Mumetopia Melander
Ischnomyia Loew
Anthomyza Fallén
Opomyzidae I.—1. Ischnomyia vittata; 2, Tethina albula; 3, Pelomyia coronata; 4, Mumetopia nigrimana; 5, Geomyza; 6, Anthomyza; 7, Mumetopia occipitalis; 8, Opomyza; 9, Mutilloptera apicalis; 10; Opomyza; 11, Anthomyza; 12, Ischnomyia vittata; 13, Tethina; 14, Pelomyia occidentalis; 15, Pelomyia, chaetotaxy.
6. Frontal vitta with bristles (2, 13).............................. *Rhiernoëssa Lœw
Frontal vitta without bristles (Chyromyidæ)................... † Neossos Malloch

7. Acrostical hairs present........................................ S
   Acrostical hairs absent...................................... *Pelomyiella Hendel

8. Oral margin strongly produced forward; lower edge of head straight
   and long .......................................................... Neopelomyia Hendel
   Face not strongly produced below, the lower edge convex (3, 14, 15).
   *Pelomyia Williston

9. Scutellum with hair; wing with anal angle (8, 10).......... Opomyza Fallén
   Scutellum with bristles only; no trace of anal angle.......... 10

10. Hind margin of the wing strongly concave (9)............... Mutiloptera Coquillett
    Hind margin of the wing at most very weakly concave (5).
    Geomyza Fallén

Family Agromyzidæ—The Leaf Miners

Small flies, blackish or yellowish in color, the postocellar bristles always present.

Head usually higher than long; front with at least three pairs of bristles; ocellars and postocellars present, the latter divergent; face receding or concaev in profile; antennæ decumbent, the third segment rarely much longer than wide; arista pubescent or bare; oral vibrissæ present. Eyes large, the cheeks rarely half as wide as the eye-height. Legs short, the femora with bristles. Wings of moderate size, the venation complete or with the posterior crossvein absent; auxiliary vein more or less fused with the first vein or incomplete. Abdomen more or less depressed.

The adults occur everywhere and there are few deciduous plants which are not mined by their larva. Owing to their small size they are easily overlooked although easily recognized.

The larvae make characteristic mines in the leaves of plants and most of them may be identified by the mines.

KEY TO GENERA

1. Arista absent (See Ochthiphilidæ, 3 and 5) ........ *Cryptochaetum* Rondani
   Arista present .................................................. 2
2. Posterior crossvein present .................................. 3
   Posterior crossvein absent .................................. 7
3. Posterior crossvein situated beyond the anterior crossvein 4
   Posterior crossvein situated nearer to the base of the wing than the anterior crossvein (10) ......................... *Napomyza* Haliday
4. Mesopleura with one or more bristles ...................... 5
   Mesopleura bare ................................................. 6
5. Third antennal segment with the upper apex acutely pointed (3, 5) 
   *Cerodontha* Rondani
   Third segment not with an acute point, though sometimes angular (6, 7) 
   *Agromyza* Fällén
6. Front strongly produced forward, the ocelli situated on the anterior part (1, 9) .............................................. *Traginops* Coquillett
   Front regular in outline, the ocelli situated near the vertex .......... 8
7. Fourth vein ending before the wing-tip ..................... *Antineura* Melander
   Fourth vein ending behind the wing-tip (8, 11) .................. *Phytomyza* Fällén
8. Apical cell slightly narrowing apically .................... *Schildomyia* Malloch
   Apical cell widening apically, the costa not extending to the fourth vein (2, 4) ............................................. *Odinia* Desvoidy

* I have not seen this genus and its relationship is somewhat doubtful.
Family Phyllomyzidae

Small flies, usually black, sometimes silvery pollinose.

Costa broken at the humeral crossovein and at the apex of the auxiliary vein; postocellar bristles convergent or parallel; anterior frontals convergent, the others divergent, procline or reclinate; interfrontals present or there are rows of hairs; oral vibrissa present though sometimes but poorly differentiated from the other bristles; proboscis long and geniculate, or short; antennae not elongate, often small. Mesonotum with one to four pairs of dorsoceentrals: mesopleura with or without bristles; pteropleura sometimes with distinct bristles. Legs moderately short. First vein ending near the basal third of the wing; second basal and anal cells small; posterior crossvein absent in Paramyia; costa usually bristly basally. Abdomen short and rather broad, the bristles weak or absent.

These flies were included by Williston in the Agromyzidae while other authors have recognized the Milichiidae and Carnidae. Phylloomyza is an older generic name than Milichia and I do not consider the differences between the genera placed in the Carnidae and Phylloomyzidae as of more than generic value.

The adults are rather common and may frequently be found on fence posts, fences, logs, tree-trunks, etc. in the hot sun, or they may be taken by sweeping, on foliage or in grass. I have collected them only during dry weather and always in the bright sunlight. Keys to the species will be found in Melander's revision of the family,* and in a paper by Malloch†.

KEY TO GENERA

1. Posterior crossvein present................................................................. 2
   Posterior crossvein absent (4, 26)..............................................Paramyia Williston

2. Costa extending to the fourth vein.................................................. 5
   Costa stopping at the third vein................................................... 3

3. Proboscis very elongate and geniculate (3, 20)............Aldrichiella Hendel
   Proboscis short ................................................................................. 4

4. Mesopleura bare (2, 9, 13)..............................................................Euchlorops Malloch
   Mesopleura with two or three bristles (6, 21).....................Meoneura Rondani

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Phyllomyzidae
5. Costa with a very deep excision at the apex of the auxiliary vein; cruciate interfrontals developed ........................................ 6
   Costa broken but the excision not extending into the cell; interfrontal hairs present .................................................. 10

6. Mesopleura with strong bristles ........................................ 7
   Mesopleura bare .............................................................. 8

7. Proboscis very long, geniculate ........................................ Paramilichia Malloch
   Proboscis geniculate, but not unusually long (19, 23) ........ Pholeomyia Bilimek

8. Posterior margin of the eye excised at the middle ......................... 9
    Posterior margin of the eye not excised ................................ Milichia Meigen

9. Four pairs of dorsocentrals (18, 22) ................................... Eccoptomma Becker
    One or two pairs of dorsocentrals (17, 22) ......................... Milichiella Giglio-Tos

10. Apical cell very widely open, at most a little narrowed apically .... 11
    Apical cell only narrowly open (5, 12) ................................ Eusiphona Coquillett

11. Bristles of the head and thorax strong; eyes at most short haired ..... 12
    Bristles of head and thorax not strongly differentiated from the hair; eyes rather long pilose ........ Arctobiella Coquillett

12. Proboscis geniculate, long and chitinized; vibrissal angle usually distinct .......................................................... 13
    Proboscis shorter and more or less fleshy, the labellae not elongate though folding back; vibrissal angles not developed; face strongly carinate (8) ................................................... Hemeromyia Coquillett

13. Posterior tibiae flattened and broadened ................................ 14
    Posterior tibiae not unusually flat and wide .......................... 16

14. Pteropleura with one or more small bristles (Paramadiza Malloch; Mallochiella Melander) (1, 11) .......................... Hypaspistomyia Hendel
    Pteropleura without bristle ............................................... Hypaspistomyia Hendel

15. Glossy black; frontal bristles weak (14, 15) ........................ Desmomyza, n. g.
    Dull colored; frontals stronger; two pairs of divergent frontals; interfrontals in differentiated rows (16, 10) ...................... Desmometopa Loe

16. Lower edge of the head horizontal and long (24, 25). ................. Platophrymyia Williston
   Lower edge of the head rounded or short ................................ 17

17. Eyes hairy; palpi very large, projecting far beyond the oral margin (7) ................................. Phyllomyza Fallén
    Eyes bare or nearly so; palpi not projecting .......................... 18

18. Five or six pairs of orbitals ............................................. 19
    Three pairs of orbitals .................................................. Cacoxenus Loe

19. Apical scutellars converging ............................................ Neophyllomyza Melander
    Apical scutellars diverging .......................................... Stomosis Melander
Phylomyzidæ II.—15, Desmomyza confusa; 16, Desmometopa; 17, Milichiella; 18, Ecceoptoma; 19, Pholeomyia indecora; 20, Aldrichiella agromyzina; 21, Meoneura vagans; 22, Milichiella lacteipennis; 23, Pholeomyia indecora; 24, 25, Platophrynia nigra; 26, Paramyia nitens.
Desmomyza, new genus

Related to Hypaspistomyia Hendel but differing in having the pteropleura entirely bare instead of having some setulae above. Genotype:—D. confusa n. sp. (New York).

The genotype is extremely like H. glabra Fallén, of which I believe Desmometopa halleralis Coquillett to be a synonym. It is entirely shining black except the base of the tarsi, the wings are milky white with yellowish veins. The only difference between Desmomyza and Hypaspistomyia, to which I refer glabra, lies in the presence in the latter of pteropleural setules. The type of halleralis has these, as do European specimens of glabra examined by me, hence my belief that Coquillett's species is the same as glabra. The weaker frontals will separate Desmomyza from Desmometopa.
Family Chloropidae—The Frit Flies

Crassiseta species.

Small to very small, bare or nearly bare flies.

Head usually rather hemispherical, sometimes more or less triangular or rectangular, the face usually nearly vertical or reeding; oral vibrissae weak or absent; front broad, sometimes with bristles, the vertical triangle very large, often extending to the anterior margin of the front. Antennæ usually short, with rounded third segment, sometimes elongate. Wings of moderate length or rather short, auxiliary vein vestigial; second basal cell united with the discal cell; anal cell absent; fifth vein almost always with a slight, characteristic irregularity near the middle of the discal cell. Legs short, the femora rarely greatly thickened.

These flies are very common and representatives of the family may be collected almost anywhere. The family will be readily recognized as the large vertical or frontal triangle is characteristic and the peculiar gentle curve of the fourth vein is typical of the group.

The larvæ live in grass and other plants and some of them are economic pests of cereals. They are thick and cylindrical, with stout mouth hooks, two segmented antennæ and fleshy abdominal protuberances for locomotion.

The generic limits in some cases are evidently weak and it is not always easy to place some species with certainty. I am not certain that the so-called horny geniculate proboscis of Madíza Fallén constitutes a generic character in this case since there is a gradual evolution to the normal type found in Oscinella Becker. The apical section of the pro-
boscis is nothing more than the labellae which are lengthened and narrowed and it is not always easy to decide whether the proboscis is geniculate or not. Trouble will also be experienced in connection with the pubescence of the arista and the presence of frontal bristles, both of which are characters which show gradual development in the presence of extensive collections. The only revision of the North American species of this family is by Becker. In a recent paper on the Neotropical forms Duda† has proposed many new genera but his contribution has been so badly mangled by deletion necessitated in order to reduce its size to the absurd limits set by most publications that it is almost impossible to follow his keys.

**KEY TO GENERA**

1. Costa extending to the fourth vein ........................................ 11
   Costa ending at the third vein or slightly beyond it .................... 2

2. Posterior crossvein absent ............................................. Elliponeura Loew
   Posterior crossvein present .................................................. 3

3. Posterior femora greatly thickened, their tibiae strongly arcuate (4, 17) ..... Meromyza Meigen
   Posterior femora only moderately thickened, their tibiae but little curved .................................................. 4

4. Middle tibiae with a strong, curved apical spur; male genitalia large, carried forward under the abdomen (6, 14, 21) ............... Cetema Hendel
   Middle tibiae with normal terminal bristles .................................. 5

5. Posterior tibiae with an oval, opaque “sensory organ” posterodorsally, the tibiae somewhat broadened (18, 23, 26) ............... Chloropisca Loew
   Posterior tibiae without velvety sensory area ................................ 6

6. The distance between the crossveins along the fourth vein is not greater than the length of the posterior crossvein (11) . Diplotoxa Loew
   The distance is equal to at least twice the length of the posterior crossvein .................................................. 7

7. Mesonotum entirely black, coarsely punctured .......... Ephichlorops Becker
   Mesonotum usually vittate, not wholly black nor coarsely punctured... 8

8. Third antennal segment conspicuously longer than broad ............... 9
   Third segment rather circular in outline, often broader than long, never conspicuously longer than broad (2, 3) ............... Chlorops Meigen

9. Frontal triangle shining .................................................. 10
   Frontal triangle opaque (28) ................................................. Anthracophaga Loew

10. Frontal triangle very long and broad, ending in a broad, obtuse point
    a little before the base of the antennae, convex in cross-section (12, 21) .................. Ectecephala Macquart
    Frontal triangle strongly narrowing anteriorly and ending in an acute point, flat in cross-section (16, 25) ............... Parectecephala Becker

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Chloropidae II.—14, Cetema hypocera; 15, Oscinella varipalpus; 16, Parectecephala; 17, Meromyza americana, hind leg; 18, Chloropisca variceps, hind tibia; 19, Ceratobarys pulophus; 20, Oscinella tripunctata; 21, Cetema, middle tibia; 22, Oscinella magnipalpoides; 23, Chloropisca.
11. Posterior tibiae with a strong, curved ventral spur at or before the excavated apex (5) .............................................. 12
Posterior tibiae normal .................................................. 15

12. Arista flattened and strap-like (19) ......................... Ceratobarys Coquillett
Arista of ordinary shape, practically bare .................... 13

13. Scutellum elongated, with flattened disc .................. Prohippelates Malloch
Scutellum with convex disc and of normal length ................ 14

14. Front with distinct bristles toward the orbits .......... Pseudohippelates Malloch
Front without bristles (5) ........................................... Hippelates Løw

15. Distance between the tips of the second and third veins at least twice that between the first and second ................... Siphunculina Rondani
Distance between tips of second and third veins but little more than that between the first and second ...................... 16

16. Arista bare or quite short pubescent ......................... 20
Arista broadened or long pubescent ............................... 17

17. Arista appearing broadened and strap-like due to the arrangement of the dense pubescence ................................... Crassiseta Von Rössner
Arista pubescent ................................................................ 18

18. Scutellum with strong marginal processes (1, 27) .... Dactylothrya Duda
Scutellum without marginal processes .............................. 19

Chloropidae III.—24, Ectecephala; 25, Parectephala; 26, Chloropisca; 27, Dactylothrya curvinervis; 28, Anthracophaga sangullenta.
19. Scutellum elongated, the disc flattened (8, 10) ... *Pseudogaurax* Malloch
   Scutellum normal, the disc gently convex ... *Gaurax* Læw

20. Only two notopleural bristles on posterior part. ... 22
   At least four notopleural bristles. ... 21

21. Notopleural bristles four in number; mesonotal setulae in rows.
   *Eugaurax* Malloch
   Notopleural bristles very numerous; mesonotum thickly setulose.
   *Chaetochlorops* Malloch

22. Distance between the tips of the first and second veins three or four
times that between the second and third (9) ... *Dicræus* Læw
   Distance between tips of first and second veins not more than twice
   that between the second and third. ... 23

23. Proboscis elongated and geniculate, the terminal section about as long
    as the preceding section (7, 13) ... *Madiza* Fallén
   Proboscis shorter, the apical section shorter and more fleshy. ... 24

24. Mesonotum with three broad longitudinal punctured grooves. *Tricimba* Lioy
   Mesonotum with only two narrower grooves or they are weak or absent
   (15, 20, 22) ... *Oscinella* Becker
Family Ephydridæ—The Shore Flies

Ochthera humilis.

Small to very small flies, the anal cell absent, the second basal and discal cells united.

Face more or less, often remarkably convex, the oral cavity rounded, sometimes very large; clypeus distinct but often retracted within the oral cavity; no distinct oral vibrissæ but the sides of the face often with bristles or hairs. Antennæ short; arista bare, pubescent or pectinate, always dorsal. Thorax gently convex, bristled. Legs short; tibiae without preapical bristle, the middle pair with apical spur. Wings rarely aborted; auxiliary vein united with the first vein except basally; costa broken before the tip of the first vein and weakened beyond the humeral crossvein; second basal and discal cells united; anal cell absent or extremely small and incomplete. Abdomen composed of six segments in the males, seven in the females, the number sometimes apparently reduced to three, variable but never elongate, often quite wide; genitalia usually retracted; body usually with but few hairs.

The adults are found in moist places, inhabiting marshes, swamps and the shores of lakes, ponds, and streams, along the edges of brooks and the sea shore. Many of the species are of local habitat but most of them are widely distributed. Some species occur in the flowers of water plants and have been found nowhere else. Water lilies are usually frequented by several species while in bloom and many occur on the
Ephydridae. 1—1, Lytogaster; 2, Hydrina; 3, Ochtheroidea atra; 4, Parydra; 5, Brachydeutera argéntata; 6, Notiphila; 7, 8, Lipochaeta; 9, Allotrichoma; 10, Discocerina; 11, Ephydra; 12, Gastrops; 13, Brachydeutera; 14, Lytogaster; 15, Atissiella; 16, Ochtheroidea; 17, Lytogaster; 18, Hydrina; 19, Atissiella.
leaves. Some of the species are able to walk on the surface of water and many of them will alight upon it if disturbed but they usually quickly return to the shore.

The larvae live in various habitats, many are aquatic or live in mud, others in the stems of aquatic or semi-aquatic plants, a few in flowing sap. Many of them live in brackish, but may also occur in fresh, or even in alkaline water. One species, *Psilopa petrolei* Coquillett, occurs in the pools of crude petroleum found in California, breathing by projecting the posterior spiracles above the surface of the oil, but its food is unknown. Other species are found in the warm waters of geysers.

Many new genera have been described since the publication of Williston's Manual and some authors have recognized the Notiphilidae as a separate family but there appears to be no good basis for this. Jones* reviewed the family in 1906. Since then there has been no comprehensive publication although Cresson has published several large papers containing descriptions of new species and genera and some keys.

KEY TO GENERA.

1. Scutellum normal ................................................................. 2

Scutellum as large as the mesonotum and almost concealing the abdomen, from dorsal view (see text figure) ...........Peltopsilopa Hendel

2. Costa extending to the fourth vein ....................................... 3

Costa ending at the third vein .............................................. 53

3. Antennæ small, inserted very far apart in cavities, the arista atrophied, very short and blunt (7, 8, 71) ..............Lipochaeta Coquillett

Antennæ normal; arista always long ........................................ 4

4. Middle tibiae with dorsal bristles (30, 57) ......................†Paralimna Lœw

Middle tibiae without bristles except at the apex .................. 5

5. Second antennal segment with a spinous bristle at the upper apical corner ............................................................... 6

Second antennal segment without such bristle ......................... 31

6. First and fifth abdominal segments exceptionally short, the abdomen apparently composed of three long segments, the lateral margins revolute ................................................................. 7

Abdomen with five distinct segments, the lateral margins not margined. 8

7. Face with two pairs of bristles below ......................Trimerinoïdes Cresson

Face with one pair of bristles below (48) .......................Trimerina Macquart

8. Arista pectinate ................................................................. 9

Arista bare (40, 53) ........................................................ ....Mosillus Latreille

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† Cresson, 1918. Trans-Amer. Ent. Soc., xlv, p. 45 (Costa Rica).
9. Wings with a strong fold extending the length of the discal cell near the middle and another in the apical cell (21, 49). Clanoneurum Becker
Wings without such folds ........................................ 10

10. Arista without rays below ....................................... 11
Arista with two or three rays below (38, 44) ............ Ptilomyia Coquillet

11. Face with transverse ridges, at least laterally, which may be very broad, or fine and numerous, usually limited to the lower half of the face ........................................ 12
Face without such ridges ........................................ 14

12. Facial ridges very fine, extending across the face, sometimes not continuous on the lower part (58, 66) ........ Leptopsilopa Cresson
Facial ridges very broad ........................................ 13

13. Facial ridges strong, extending across the face (68). Cerometopum Cresson
Facial ridges resulting from sub-lateral pits and not extending over the middle of the face (37, 52) .............. Discomyza Meigen

14. With only one pair of dorsocentral bristles ..................... 21
With two pairs of dorsocentrales ................................ 15

15. Ocellar bristles widely separated, situated opposite the anterior ocellus. 16
Ocellars normal, situated above the anterior ocellus .......... 19

16. Bristles on the sides of the face all convergent ............... 17
Bristles on the sides of the face partly divergent, partly convergent.

Polytrichophora Cresson

17. Face with two rows of bristles on either side ................ 18
Face with one row of bristles on either side (10, 56) . Discoceria Macquart

18. Posterior tibiae with a strong, curved apical spine (31).

Hecamedoides Hendel.
Posterior tibiae without apical spine .............................. Diclasiopta Hendel

19. Interfrontalia with two pairs of bristles (67, 72) ....... Paratissa Coquillet
Interfrontalia without bristles, the ordinary frontals present ....... 20

20. Face rather strongly carinate above, the carina ending prominently at the middle of the face (41, 63) ...................... *Ilythea Haliday
Face very gently convex longitudinally, not carinate (Typopsilopa Cresson) (51) ..................... Psilopina Becker

21. Oral opening large, the clypeus always prominent, the middle of the face usually strongly produced .................. 22
Oral opening smaller, the face usually convex and receding below, the face never strikingly produced in the middle .................. 24

22. Third costal section longer than the second (19) ......... Atissiella Cresson
Third costal section shorter than the second .................... 23

23. Ocellars inserted opposite the anterior ocellus (45) .... Atissa Haliday
Ocellars inserted above the anterior ocellus (9) ........ Alotrichoma Becker

24. Front shining .................................................. 27
   Front pollinose .............................................. 25

25. Face with longitudinal ridges below (59, 73) ........ Rhysophora Cresson
   Face without ridges below .................................. 26

26. Eyes longitudinally oval (31) ......................... Ditrichophora Cresson
   Eyes not regularly oval, widened below the middle and narrowing the
   face above (10, 56) ........................................... *Di-cocerina Macquart

27. Face carinate above (15) .............................. Athyroglotta Loew
   Face very gently convex above, without a distinct ridge ...... 28

28. Face and front on the same plane, flat, the face slightly convex be-
   low (46) .......................................................... Plagiops Cresson
   Face, front or both conspicuously convex ..................... 29

29. Second and third antennal segments pendulous, the third more than
   twice as long as wide ........................................... 30
   Antennae not pendulous, the third segment not twice as long as wide
   (39, 61) .......................................................... Psilopa Fallén

30. Spine of second antennal segment long and strong (62)
   Clasiopella Cresson
   Spine of second antennal segment fine (77) ........ Ceropsilopa Cresson

31. Oral opening small; eyes usually with distinct hair ............... 32
   Oral opening large; eyes usually bare .......................... 43

32. Anterior femora greatly enlarged, their tibiae ending in a spur ...... 33
   Anterior femora not remarkably enlarged, their tibiae not ending in a
   spur ............................................................ 34

33. Scutellum with four marginal bristles (see text figure).
   Ochthera Latreille
   Scutellum with two marginal bristles (61) .................. Stenochthera Hendel

34. Arista pectinate ............................................. 35
   Arista bare or pubescent ...................................... 38

35. Face and front polished .................................... 36
   Face and front thickly pollinose .............................. 37

36. Sides of the face with deep punctures resulting in short, transverse
   ridges (3, 16, 65) ............................................. *Ochtheroidea Williston
   Sides of face without pits or wrinkles ....................... Ceropsilopa Cresson

37. Acrostical hairs absent (36) ................................ Nostima Coquillett
   Acrostical hairs present ........................................ Hydrellia Desvoidy

38. Mesonotum with three pairs of dorsocentrals, a strong one near the
   inner end of the suture, another in front; four scutellars (2, 18)
   Hydrina Desvoidy
   Mesonotum with at most one pair of strong dorsocentrals, rarely an
   extremely weak second pair .................................. 39

* Cresson, 1918, Trans-Amer. Ent. Soc., xliv, pp. 56, 60 (Costa Rica).
Ephydridae IV.—55, Ephydra milbrae; 56, Discocerina obscurella; 57, Paralimna texana; 58, Leptopsilopa nigra; 59, Rhysophora aspersa; 60, Parydra; 61, Psilopa; 62, Clasiopella; 63, Ilythea; 64, Stenochthera; 65, Ochtheroidea centralis; 66, Leptopsilopa nigrimana; 67, Paratissa pollinosa; 68, Cerometopum mosilloides; 69, Notiphila erythrocera, middle leg.
39. Scutellar bristles arising from very strong tubercles; two pairs of frontal bristles (12, 71). Gastrops Williston
Scutellar bristles not arising from strong tubercles, if from weak tubercles there is but one pair of weak frontals. 40

40. Third antennal segment with the upper apex more or less elongate. 41
Third antennal segment with the apex rounded. 42

41. Scutellum shining (1, 14, 17). Lytogaster Becker
Scutellum opaque black or with an opaque black spot on either side (26). Hyadina Haliday

42. With one or two pairs of weak frontals (24, 51). Pelina Haliday
With one pair of strong and two pairs of weak frontals (20, 50). Glenanthe Haliday

43. Clypeus prominent. 44
Clypeus concealed. 45

44. Arista with long rays (33, 75). Edenops Becker
Arista bare or pubescent (Napava Desvoidy, preoc) (4, 22, 47, 60). Parydra Stenhammer

45. Arista with long, well separated rays. 46
Arista bare or with the rays short and numerous. 47

46. Pulvilli absent. Dimocenia Cresson
Pulvilli well developed (23). Coenia Desvoidy

47. Mesonotum with two or more pairs of dorsocentrals; middle of face without a cluster of bristles. 48
Mesonotum with only one pair of dorsocentrals; middle of face with a cluster of bristles on either side; large species (Pogonephydra Hendel) (70, 76). Cirrula Cresson

48. Arista minutely pubescent or pectinate on its whole length. 50
Arista with long, abundant rays on the basal half above. 49

49. Third antennal segment bearing a long hair on the outer surface. Setacera Cresson
Third antennal segment without long hair (11, 55). Ephydra Fallén

50. Sternopleural bristle present; face with bristles. 51
Sternopleural bristle absent; face without bristles (29). Psilephydra Hendel

51. Two pairs of divergent frontals. Eustigoptera Cresson
A single pair of divergent frontals. 52

52. A pair of strong acrosticals nearly opposite the inner ends of the suture (13, 78). Scatella Desvoidy
No strong acrosticals, these all short and continuing in two rows to the scutellum (23). Lamproscatella Hendel

53. Second antennal segment with an apical spine above. 54
Second antennal segment without apical spine above. 55

Ephydridæ V.—70, Cirrula gigantea; 71, Lipochaeta; 72, Paratissa pollinosa; 73, Rhyssophora aspersa; 74, Gastrops nebulosa; 75, (Edenops nuda); 76, Cirrula gigantea; 77, Ceropsilopa; 78, Scatella.
54. Front with a conspicuous procline orbital on either side; bristles of the face situated close to the facial grooves and strong (25, 28).
   
   *Dichaeta Meigen
   Front with hair-like orbitals in front; bristles of the face situated twice the width of the parafacial from the facial groove, rarely strong (6, 35, 69)........................... *Notiphila Fallén

55. Oral opening small; face most prominent in the middle (27).
   Axysta Haliday
   Oral opening large ........................................... 56

56. Clypeus prominent (5, 13)............................... Brachydeutera Læw
   Clypeus concealed (42) ........................................ Scatophila Becker


Peltopsilopa species.
Family Canaceidæ

Canace, head and wing.

Very small flies, not more than 3.5 mm. in length, very similar to certain Ephydridæ but with the anal cell complete.

Head large, the oral opening very large; clypeus prominent; proboscis large, with fleshy labellæ; palpi well developed; front wide in both sexes, with three or four pairs of divergent orbitals, the ocellar triangle sometimes extending to the base of the antennæ; cheeks wide, bearing bristles; oral vibrissæ present; face gently convex in profile; antennæ short, the arista bare or pubescent. Thorax short, bearing four pairs of dorsocentrals and a pair of presentellar acrosticals; scutellum with one or two pairs of bristles. Legs rather short. Auxiliary vein evaneseent apically, the costa broken before the end of the first vein; basal and anal cells complete; anal vein short. Abdomen composed of seven segments, the first not strongly differentiated from the second which is elongate.

The members of this family occur along the seashore, the larvae living in brackish water.

I believe that there is but one genus in the Neartic Region. In 1924 Malloch described a species under the name Canacea macateei, and Johnson, in his "List of the Insects of New England" recognized the genus Canacea. However, I was informed by Mr. Malloch during a conversation several years ago that "Canacea" was a slip of the pen, that he had no intention of establishing a new name, and that he was extremely doubtful that his species differed generically from Canace Haliday. I have not seen representatives of Canace but I can find nothing in the descriptions to warrant the recognition of Canacea. There are three species known from the United States, one from the
Hawaiian Islands (*Procanace*) and one from Panama (*Neocanace*) and at least two from South America (*Canace* and *Neocanace*).

The following key includes the described genera of which I have records.

**KEY TO GENERA**

1. First vein haired above on the apical half
   
   **Macracanace** Tonnoir and Malloch
   
   First vein bare above ........................................ 2

2. Four pairs of dorsocentral bristles ................................ 3
   
   Only two pairs of dorsocentral bristles ...................... **Xanthocanace** Hendel

3. Pleura bare.......................................................... 4
   
   Pleura with bristles and bristly hairs ...................... 5

4. Frontal triangle extending to about the middle of the front; antennae reaching to the oral margin (*Dinomyia* Becker) ........ **Procanace** Hendel
   
   Frontal triangle extending to the anterior margin of the front or almost so; one pair of scutellar bristles ............ **Chaetocanace** Hendel

5. Face evenly convex .............................................. **Canace** Haliday
   
   Face concave below the middle, convex above (*Procanace* Curran, not Hendel) ........................................ **Neocanace**, n. n.
Family Diopsidæ—The Stalk-eyed Flies

*Sphyrocephala brevicornis* Say.

The members of this family are mostly rather small, with the eyes situated on the ends of long stalks, a character not developed in our one genus.

Weakly haired, almost bare, the head transverse, short, conspicuous produced toward either side so that the eyes are separated by about four times their width; antennæ very widely separated, the basal segments short, the third roundish, with dorsal arista; front bare except at the vertex; oral vibrissæ absent. Legs of moderate length, the anterior femora thickened and with short spines beneath. Auxiliary vein closely approximated to the first vein for most of its length but ending far before it; second basal cell united with the discal cell; apical cell somewhat narrowed apically; anal cell long, the anal vein short.

The only American representative of this family is *Sphyrocephala brevicornis* Say, a quite small and inconspicuous species. In the Nearctic region there are no flies which resemble it in the shape of its head but in the Neotropical region there are many Otitidæ and Drosophilidæ which have the eyes more or less stalked, one Otitid having much longer stalks than any true Diopsid I have seen.

Our single species is found along the edges of streams, ponds and marshy lakes and occurs from early spring to late autumn and has been taken in numbers about a privy and on skunk-cabbage. The immature stages are unknown.

This family has a particular fascination for most people owing to the peculiar structure of the head. Why the eyes are stalked we do not know and there may be no reason for it.
KEY TO GENERA OF THE WORLD

1. Mesopleura not produced to form a strong spine.......................... 2
   Mesopleura produced and forming a strong spine similar to that on
   the hypopleura..........................................................Teleopsis Rondani

2. Mesonotum with a pair of long, black intra-alar bristles............... 3
   Mesonotum without intra-alar bristles..............................Diopsis Linnaeus

3. Scutellum longer than deep, without bristles except on the ends of the
   processes ................................................................. 4
   Scutellum very short, as deep as long, with a pair of erect black bristles
   on the disc ..............................................................Diopsina Curran

4. Eye-stalks little longer than wide, with a strong bristle behind each
   antenna in addition to that behind the eye......................Sphyracephala Say
   Eye-stalks longer, usually very long, either with a bristle near the
   middle and far before the base of the antennae or without frontal
   bristles, only the one behind the eye being present.............. 5

5. Eye-stalks short, not over three times as long as wide, without median
   bristle; steropleural spine short; bend of fifth vein without append-
   age; anal vein continued beyond the anal cell................Microdiopsis, n. g.
   Eye-stalks very long, with a median bristle; pteropleural spine long
   and acute; bend of fifth vein with appendage; anal vein not continued
   beyond the anal cell.................................................Diasemopsis Rondani

Microdiopsis, new genus

Proposed for Sphyracephala colthurnata Bigot, from the East
Indies. The genus differs from Sphyracephala in having longer eye-
stalks, with the antennae close to the eyes, no bristle on the middle of
the stalk, no appendage at the bend of the fifth vein, etc.

Diopsina ferruginea.
Family Borboridae

Rather small to very small, usually black or brown flies.

Head hemispherical, the face rather perpendicular, concave or somewhat retreating; oral vibrissae present; front broad, usually with bristles. Antennae short, rounded or oval, with dorsal, pubescent or bare arista. Wings rarely absent; auxiliary vein incomplete or practically absent; second basal and anal cells often incomplete or absent. Legs of moderate length, the femora strong; basal segment of the posterior tarsi short and usually dilated.

The Borborids are almost always found about decomposing organic matter, in swampy places and about excrement.

The larvae of Borborus live in excrement and refuse and are cylindrical, their skin roughened by minute bristles; antennae two segmented; mouth hooks well developed; posterior segment with a conical protuberance and smaller tubercles about the spiracles. In Limosina the posterior spiracles are tube-like and the larvae are found in fungi, algae, etc.
The North American species have been monographed by Spuler.* Here is one of the best examples of the short sighted policy of Entomological publications in refusing to accept long papers and Spuler’s work has lost much of its value. The work appeared in seven different journals (of various sized pages) and in nine parts and the entire sequence has been lost.

**KEY TO GENERA**

1. Wings and halteres present .................................................. 2
   Wings and halteres absent .................................................. *Aptilotus* Mik

2. Mesonotum and scutellum with bristles .................................... 3
   Mesonotum and scutellum without bristles (1) ......................... *Sphaerocera* Latreille

3. Fourth vein reaching the margin of the wing .......................... 4
   Fourth vein not nearly reaching the wing margin (2, 3, 4). 
   *Leptocera* Olivier

4. Posterior tibiae with an apical spur below (5, 6, 7) ........... *Borborus* Meigen
   Posterior tibiae without apical spur (8) ....................... *Scatophora* Desvoidy

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Family Clusiidae

Rather small flies in which the wings are almost always marked with black or brown.

Head broad, sub-hemispherical; face short, nearly vertical or gently receding below; front broad, with three or four pairs of frontals and often with a pair of cruciate interfrontals; ocellars present or absent; postverticals divergent, rarely absent. Antennæ porrect, the basal two segments short, the third rounded, with a terminal or subapical arista which may be bare, pubescent, or thickly long haired. Proboscis short, the palpi rather broad. Abdomen of moderate length, rather slender. Legs of moderate length, slender, the tibiae with or without a preapical bristle. Wing venation complete, the second basal and anal cells very small; first vein ending near the basal fourth of the wing, the auxiliary vein narrowly separated from it.

The adults are found in moist places and about decaying wood, sometimes occurring in large numbers, although most of the species are not common.

The larvae occur in decaying wood and under the bark of trees. They are white, slender, cylindrical and slightly thickened posteriorly. Mouth hooks small, the segments not distinctly separated but with transverse ventral swellings for locomotion. They have the power of leaping, accomplishing this by grasping the hooklets on the apical segment with their mouth hooks and suddenly letting go. The puparia are yellowish, ellipsoidal and with horns on the apical segment as in the larvae.

Melander and Argo* have revised the American species of the family including many species from other regions. The vast majority of the species are tropical. Of the seventy known American species only a small number occur in the Nearctic region.

KEY TO GENERA

1. Eyes with microscopic pubescence; costa broken near the humeral crossvein (8, 11) ........................................Acartophthalmus Czerny
   Eyes bare; costa weakened or broken near the end of the auxiliary vein. 2

2. Anterior pair of frontal bristles convergent or proclinate............... 4
   All the frontal bristles reclinate ........................................ 5

FAMILY CLUSIDE

3. Cruciate interfrontals arising from the orbits (9, 14) ... Czernyola Bezzi
   Cruciate interfrontals arising on the frontal vitta (1, 4, 7).
   Clusioides Coquillett

4. Cruciate interfrontals absent ........................................ 5
   Cruciate interfrontals present (5, 10) ................................ Clusia Haliday

5. First vein with dorsal setae; postverticals absent (2, 6).
   Chaeotclusia Coquillett
   First vein bare; postverticals present ................................. 6

6. Preapical bristles on middle tibiae and prescutellar acrostical bristles
   present; presutural dorsocentraals absent (12, 13) ... Sobaroccephala Czerny
   Preapicals and prescutellar acrosticals absent (3) ... Heteromeringia Czerny
Family Chamaemyidae

Small flies, usually grayish in color.

Front wide, with at most two pairs of bristles, often bare; face gently concave or strongly receding; oral vibrissae absent; postverticals convergent or absent; proboscis short; antennæ short. Mesonotum with or without bristles; prothoracic bristle absent; one sternopleural; mesopleura usually bare, rarely setulose. Front femora with bristles; tibiae without preapical bristle. Wings with the auxiliary vein entire, sometimes touching the first vein before its end; anal vein not reaching nearly to the wing margin, the anal and second basal cells always complete; costa not broken. Abdomen short or slightly elongate.

The larvae of *Leucopis* are predacious upon aphids and I have found them commonly on plant lice attacking thistle, *Oenothera*, burdock, etc. They are somewhat triangular in outline, the posterior spiracles being located at the posterior corners of the body and strongly projecting. All I have seen have been pale yellowish, with a darker median vitta. They usually conceal themselves under the aphids or in the axils of leaves. Pupation usually takes place in the axils, the head pointing upward on the stem, but the location is variable.

**KEY TO GENERA**

1. Front without distinct bristles ........................................ 2
   Front with one or two pairs of strong bristles .................... 4

2. Arista absent (Agromyzidae) (3, 5) .................. *Cryptochaetum* Rondani
   Arista present ...................................................... 3

3. Shining black species ............................................ *Paraleucopis* Malloch
   Densely cinereous pollinose species (2, 13) .................... *Leucopis* Meigen

4. Face very strongly receding, the head pointed (1, 10).
   *Acrometopia* Schiner
   Face only a little retracting ..................................... 5

5. Three or four pairs of dorsocentrals.............................. 6
   Two pairs of dorsocentrals (4, 8) ......................... †*Pseudodinia* Coquillett

6. Three pairs of dorsocentrals (*Ochthiphila* Fallén) (6, 7, 12).
   *Chamaemyia* Meigen
   Four pairs of dorsocentrals (9, 11) ......................... ‡*Plunomia*, n. g.

† A paratype of *Pseudodinia polita* Malloch lacks the two strong frontals and I would place it in *Paraleucopis* but it lacks the setulae on the underside of the costa.
‡ For *Chamaemyia elegans* Malloch, 1921, not Panzer.
Family Tetanoceridae—The Marsh Flies

Head short, as broad or broader than the thorax; face retreating, more or less perpendicular below; oral vibrissae absent. Abdomen composed of six segments, rather long and narrow, sub-cylindrical. Wings longer than the abdomen; auxiliary vein entire, wholly separated from the first vein; posterior basal and anal cells complete, small. Legs of moderate length, the femora with bristles, the middle pair with a short bristle near the middle of the anterior surface; tibiae with preapical bristle.

The adults are found in moist places, along the banks of streams, ponds, etc. and most of them may be recognized on sight by the shape of the head.

Tetanoceridae 1.—1, 2, 3, Sepedon, wing, hind leg and head; 4, Dietya sp.; 5, Tetanocera; 6, Dyctia nana; 7, Dyctia; 8, Thecomyia (S. America); 9, Trigonometopus (Sapromyzidae) (Williston).
The larvae are slender, cylindrical, thin anteriorly, the terminal segment with six or eight conical, fleshy tubercles. They are aquatic.

The North American species have been reviewed by Cresson (1920, Trans. Amer. Ent. Soc., xlvi, pp. 27-89) and Melander (1920, Ann. Ent. Soc. Amer. xiii, pp. 305-332), the former under the name Sciomyzidae.

**KEY TO GENERA**

1. Propleural bristle present .................................................. 2
   Propleural bristle absent .................................................. 5

2. Anterior tibiae with two approximate preapical bristles dorsally...... 3
   Anterior tibiae with one dorsal preapical bristle....................... 4

3. Arista densely short white haired (19) .................................. Oidematops Cresson
   Arista with long, black rays (20) ........................................ Sciomyzia Fallén

4. Front polished black; cheeks narrow (21) ............................... Pteromicra Lioy
   Front dull; cheeks moderately broad (22) ............................. *Melina Desvoidy

5. Scutellum with two pairs of bristles .................................... 7
   Scutellum with one pair of bristles ....................................... 6

6. Second antennal segment longer than the third (1, 2, 3, 17, 18) ....... Sepedon Latreille
   Second antennal segment shorter than the third ....................... Hemitelopteryx Cresson

7. Third antennal segment oval, three times as long as the second; front distinctly narrowed anteriorly ....................................... 8
   Third antennal segment rarely oval, usually flattened or concave above, the second segment at least half as long as the third.............. 9

8. Posterior tibiae with two preapical dorsal bristles (2, 3) .......... Renocera Hendel
   Posterior tibiae with one preapical dorsal bristle ................... Antichaeta Haliday

9. Mesopleura and pteropleura with one or more bristles ............. 10
   Mesopleura and pteropleura at most with short hairs .................. 11

10. One sternopleural bristle (12) ......................................... Hoplodictya Cresson
    No sternopleural bristle (4, 6, 7) ...................................... *Dictya Meigen

11. Two or three pairs of dorsocentrals ................................... 12
    One pair of dorsocentrals (14) ........................................ Hedroneura Hendel

12. Two pairs of dorsocentrals ............................................. 13
    Three pairs of dorsocentrals (25) ..................................... Poecilographa Melander

13. Mesopleura and pteropleura bare ....................................... 14
    Mesopleura and pteropleura with setulae ................................ 16

14. Frontal lunule exposed; wings brown with rounded clear spots ...... 15
    Frontal lunule mostly concealed; wings never with rounded, clear spots (5, 24, 26, 27) ........................................ Tetanocera Dumeril

* Dyctia Desvoidy is an older name but its use conflicts with Dictya Meigen.
15. Second antennal segment slender, much longer than the third (16).
   Dictyomyia Cresson

Second antennal segment broad, slightly longer than the third (13).
Euthycera Latreille

16. Arista practically bare; infrasquamaal swellings with bristles.
   Elgiva Meigen

Arista with long rays or long pubescent.......................... 17

17. Arista with long, black rays (10)............................. Trypetoptera Hendel

Arista white pubescent (11, 15)................................. Limnia Desvoidy

22. Dyctia nana; 23. Renocera johnsoni; 24. Tetanocera, middle femur and tibia; 25,
Family Chyromyidæ

Small flies, the wings sometimes pictured.

Subcosta entire, free and ending in the costa, the costa weakened before its end; postocellar bristles convergent; plates of the orbital bristles extending almost to the anterior border of the front; head higher than long, more or less receding below, the oral margin never conspicuously produced; two pairs of frontal bristles; palpi not large; proboscis short and fleshy; antennæ shorter than the face; arista pubescent. Mesonotum usually with five pairs of dorsocentrals, two pairs of scutellar bristles; mesopleura with one or more bristles; sterno-pleurals, two to four in a straight line along the upper edge; propleural bristles present. Tibiae usually with preapical bristles. Anal and second basal cells complete; costa with spines. Abdomen rather narrow, bearing bristles on the apices of the segments; genitalia small.

The species of Chyromyza differ from those of the other genera in having three pairs of frontal bristles, the anterior pair convergent, four pairs of dorsocentrals and no preapical tibial bristles. There are at least two North American species, flava Linnaeus, and another that is either minima Becker or an undescribed form since it bears only a single pair of dorsocentrals. Some species placed in the genus Aphaniosoma Becker have five pairs of dorsocentrals or the number may be reduced to one or two distinct pairs with a row of bristly hairs in front of the suture. These two genera have been placed in a separate family, based upon the absence of preapical bristles on the tibiae, but I do not see how the family can be maintained.

I am not well acquainted with the habits of these insects but believe that all are found on foliage near the sea coast and in moist places. The number of known species is not large and most of the American species are southern in distribution or occur along the coastal regions.

Malloch would unite this family with the Helomyzidæ but the head characters appear to indicate a very distinct difference and I fail to see any really close relationship. Melander included the genera in the Geomyzidæ* and keys to the species will be found in his work.

 keynote to genera

1. All the tibiae with preapical bristles ........................................... 2
   Tibiae without preapical bristles ............................................. 4

2. Cheeks half as wide as the third antennal segment ....................... 3
   Cheeks not over one-third as wide as the third antennal segment.  
   Spilochroa Williston

3. Cheeks not half as wide as the eye-height; bristles black .......... 5
   Cheeks almost as wide as the eye-height; bristles wholly yellow (3, 4).  
   Zagonia Coquillett

4. Anterior pair of orbitals convergent (5, 6) ......................... Chyromya Desvoidy
   All the orbitals reclinate .................................................. Aphaniosoma Becker

5. Mesopleura with hairs and a strong bristle (1, 2) .... Trixoscelis Rondani
   Mesopleura bare ........................................................... Neossos Malloch

Chyromyidae.—1, 2, Trixoscelis; 3, 4, Zagonia flava; 5, 6, Chryomyia flava.
Family Megamerinidae

Small, elongate, slender flies with petiolate abdomen and incrassate posterior femora.

Head nearly spherical, broader than high; front moderately broad in both sexes; frontal bristles absent, the ocellars and verticals strong; face very gently convex, without vibrissæ; antennæ of moderate length, decumbent. Thorax elongate and narrow, with bristles posteriorly; mesosternum long, the posterior two pairs of legs approximate; scutellum short and broad. Abdomen elongate and elavate, the basal segments slender and fused. Legs of moderate length, the posterior femora strongly swollen and with bristles below on the apical half. Wings narrow; auxiliary vein absent; first vein ending at basal third of the wing; first basal cell long, the anal cell as long as the second basal, more or less rounded apically.

The single genus representing this family in America occurs in the tropics. I have seen only four specimens collected on Barro Colorado Island, Canal Zone, and Cresson had the same number from Costa Rica. I found the specimens among rather thick foliage in moist places. They resemble species of Sphegina (Syrphidae) although much smaller, but, of course, the resemblance is only superficial.

Syringogaster Cresson is our only genus and is represented by two described species, both of which occur in Panama.

I am not certain that this genus belongs to the Megamerinidae as the species show striking differences from a species of Megamerina (so named) in the American Museum of Natural History.

Syringogaster, wing, body. (Cresson)
Family Psilidæ

Somatia xanthomelas.

Flies of medium or small size.
Front broad, with bristles on the upper part; face perpendicular or receding in profile; oral vibrissæ absent; antennæ decumbent, rather short to very long; arista pubescent, rarely long plumose. Abdomen slender or moderately slender; genitalia not prominent, the ovipositor usually elongate. Wings moderately large, the auxiliary vein absent or incomplete; apical cell not narrowed apically; second basal and anal cells large. Legs rather elongate; tibiae without preapical bristles.

The adults are usually found in moist places or shady woods. The Psilidæ are not always easy to recognize but all the known species have a peculiar ridge or weakening across the basal third of the wing extending from the end of the incomplete auxiliary vein. The character is not at all conspicuous but its presence is sufficient to place the insects.

The larvae live in the roots or galls of plants and one of them is known as the carrot rust fly, often doing considerable damage to this crop. The larvae of Psila are slender, bare, cylindrical and of a pale yellowish color, the posterior spiracles forming small rounded or button-like processes.

Melander* has published a synopsis of the known species.

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* 1920, Psyche, xxvii, pp. 91-101.
KEY TO GENERA

1. Third antennal segment shorter than the arista.................. 2
   Third antennal segment longer than the arista (4, 5). Loxocera Meigen

2. Pteropleura bare .................................................. 3
   Pteropleura with hairs ........................................ Strongylophthalmyia Heller

3. A pair of dorsocentrals in front of the suture (1, 6).
   Only the prescutellar dorsocentrals present.................. 4

4. Cheeks almost half as wide as the eye-height (3, 7)........ Psila Meigen
   Cheeks at most one-sixth as wide as the eye-height.......... 5

5. Arista pubescent (2, 8) ........................................ Chyliza Fallén
   Arista long plumose (Tropical) (Text figure) ............ Somatia Schiner

Psilidae—1. Pseudopsila; 2. Chyliza; 3. Psila; 4, 5, Loxocera; 6, Pseudopsila; 7, Psila laevis; 8, Chyliza.
Flies of moderate size, living along the sea-shore.

Thorax and abdomen flat, the former depressed, with bare, shining mesopleura, the scutellum flat above. Front with bristles; cheeks with hairs and bristles, the face deeply concave; oral vibrissae absent or extremely weak; antennae short, pendulous, the second segment as large as the first. Legs usually stout, with bristles and hairs, all the tibiae with dorsal preapical bristles; basal tarsal segment long; apical tarsal segment broadened and with stout claws. Wing venation complete, the second basal and anal cells of equal length; auxiliary vein entire, the first vein ending at the middle of the wing.

The larvae live in kelp washed up on the sea-shore and sometimes occur in countless numbers.

The genus *Omozyia* Coquillett, placed in this family by its describer, belongs to the Pallopteridae. There is but one North American genus, *Calopa* Meigen. Aldrich* has recently reviewed the American species.

**KEY TO AMERICAN SPECIES OF CÆLOPA.**

1. First vein with a few hairs on apical section above (California, Oregon) .................................................. *vanduzeei* Cresson  
First vein bare .............................................................. 2

2. Males ................................................................. 3  
Females ............................................................... 5

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* Revision  * * * * Cælopa, Proc. U. S. N. M., lxxvi, Article 11, pp. 1-6.
3. Legs with spines, bristles or bristly hairs................................. 4
   Legs with soft hair only.............................................stejnegeri Aldrich

4. Abdomen with bristles on the disc of the apical segments.
   Abdomen with bristles only on the sides and apices of the segments
   (Atlantic Coast) ..................................................frigida Fabricius
   nebularum Aldrich

5. Legs usually blackish (western coast)................................. 6
   Legs reddish yellow.................................................frigida Fabricius

6. Cheeks with dense, soft, rather short hair; arista pubescent under high
   power ..............................................................stejnegeri Aldrich
   Checks with sparse hair which is coarse above; arista quite bare.
   nebularum Aldrich
Flies of moderate size, with oral vibrissae.

Face vertical or retreating; front bristly on a little more than the posterior half; antennæ short, the third segment more or less rounded. Abdomen composed of six segments, the male genitalia conspicuous. Wings moderately large, the costa usually with short bristles; second basal and anal cells small; first vein bare. Tibiæ with preapical bristle.

The so-called frontal plates, characteristic of this family and poorly developed in most other families are actually a differentiated, broad, pollinose strip on either side of the front. They are slightly oblique, diverging from the eyes anteriorly and the frontal bristles are situated on them. The presence of these "plates", in conjunction with the shape of the antennæ serve as a ready means of identifying a Helomyzid.

The flies are found in various habitats, generally in shady or damp places. Adults have been collected by burying a tin can with its open end flush with the ground and examining it early in the morning.

The larvæ are scavengers and live upon decaying animal and vegetable substances, in fungi, excrement, etc. They are cylindrical, rather pointed anteriorly, obtuse behind; antennæ situated upon long conical processes; mouth hooks large; abdominal segments widened in front laterally, with bristly pseudopods ventrally.

Czerny* has monographed the family while Garrett and others have published papers dealing with the North American species since that time.

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## FAMILY HELOMYZIDE

### KEY TO GENERA

1. Propleural bristle absent; anal vein not reaching wing margin........ 2
   Propleural bristle present; anal vein reaching wing margin........ 4

2. Humeral bristle absent ........................................... 3
   Humeral bristle present (12) ................................... Allophyla Lœw

3. Five pairs of dorsocentrais (15) ................................. 12 Suillia Desvoidy
   One pair of dorsocentrais (14) ................................. Porsenus Darlington

4. Middle tibiae with several bristles on dorsal surface ............... 5
   Middle tibiae with only the preapical bristle dorsally ........... 6

5. Two pairs of fronto-orbitals; one pair of presutural dorsocentrais;
   wings usually mutilated (4, 16) ............................... Cridleria Curran
   One pair of fronto-orbitals; no presutural; wings entire (10, 13).
   *Ecothea Haliday

6. Pteropleura in part bristly or hairy ................................ 7
   Pteropleura bare ................................................... 9

7. Mesopleura hairy .................................................... 8
   Mesopleura bare (8, 11) ......................................... Pseudoleria Garrett

8. Prosternum with one pair of bristles .............................. Scoliocentra Lœw
   Prosternum with several bristles ............................... Trichochlamys Czerny

9. Humeral bristle present ........................................... 10
   Humeral bristle absent; 3 pairs of scutellars ................... Orbellia Desvoidy

10. Without prosternal bristles ...................................... 13
    With one or more pairs of prosternal ................................ 11

11. With one pair of prosternals .................................... 12
    With two or more pairs of prosternals (2) ........................ Helomyza Fallén

12. Anterior orbital bristle as long as the posterior ............... Anypotacta Czerny
    Anterior orbital bristle much shorter than the posterior (9).
    † Amcebaleria Garrett

13. Middle tibiae with several apical bristles on ventral surface ... 15
    Middle tibiae with only one apical bristle on ventral surface .. 14

14. First vein ending opposite or before the small crossvein (1, 6).
    First vein elongate, ending distinctly beyond the anterior crossvein.
    Tephrochlamys Lœw
    Heteromyza Fallén

15. Second vein joining the costa far beyond the tip of the first ... 16
    Second vein joining the costa only a little beyond the tip of the first.
    Lutomyia Aldrich

16. Third antennal segment more or less angulate dorsally; middle femora
    with several partial rows of bristles anteriorly; middle tarsi with
    spines at apices of segments ................................... 17
    Third antennal segment evenly rounded; otherwise different ...... 18

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*Czerny, 1928, Konowia, vii, p. 52.
†Czerny, 1927, Konowia, vi, p. 38.
17. One frontal bristle; eyes very small (3) ................. Eccoptomera Lœw
Two frontals; eyes of moderate size .................. Viatica Garrett

18. Anterior frontal bristle much shorter than the posterior .......... 19
Anterior frontal bristle as long as the posterior (Postleria Garrett) (7) ........................................ Neoleria Malloch

19. Mesopleura wholly bare ........................................ 20
Mesopleura with some bristles posteriorly (17, 18) .......* Anorostoma Lœw

20. Antennal grooves distinct ......................... Schroederella Enderlein
Antennal grooves not distinctly outlined  .............. 21

21. Antennae separated from each other by about half the width of the
third antennal segment .................................. Morpholeria Garrett
Antennae separated from each other by more than the width of the
third antennal segment (5) ............................. Acantholeria Garrett


Helomyzide Ii.—13, Ecotea fenestralis; 14, Porsenus johnsoni; 15, Suillia fuscicornis;
16, Criddleria hemiptera; 17, 18, Anorostoma cinereum.
Family Dryomyzidae

Flies of moderate size, the femora without bristles.

Head short, as broad or broader than the thorax, the face retreating, more or less perpendicular below, without oral vibrissae. Abdomen composed of six segments, moderately long and narrow, more or less cylindrical. Wings longer than the abdomen, the auxiliary vein separated from the first vein; posterior basal and anal cells complete. Legs of moderate length, the tibiae with a preapical bristle.

The adults are found in moist places, along the edges of streams, ponds, etc. Swampy woods are excellent collecting spots.

The larvæ are aquatic. They are slender, cylindrical, thin anteriorly, the terminal segment with six or eight conical, fleshy tubercles.

The flies placed in this family have been included in the Tetanoceridae and Helomyzidae. From the former they are separated by the absence of femoral bristles and from the latter by the absence of oral vibrissae. The latest revision of the family is by Melander* who included the genera in the Tetanoceridae.

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Dryomyzidae.—1, 2, Macromelanderia mirabilis; 3, 4, Neuroctena anilis; 5, 6, Edoparena glauca.
KEY TO GENERA

1. First longitudinal vein bristled (3, 4) .............. Neuroctena Rondani
   First vein wholly bare ........................................ 2

2. Only two pairs of scutellar bristles .......................... 3
   Three pairs of scutellars (Edoparea glauca Coquillett) (5, 6).
   (Edoparea, n. g.

3. Costa not bristled .............................................. 4
   Costa with conspicuous short bristles on the apical half (Helcomyza
   mirabilis Melander) (1, 2) ...................... Macromelanderia, n. g.

4. Two pairs of dorsocentrals; face concave .............. Dryomyza Fallén
   At least seven pairs of dorsocentrals; face not concave in profile.
   Heterocheila Rondani
Family Muscidae

Lyperosia irritans L.

Flies of medium to small size, usually dull colored, the squamae large or of medium size, hypopleural bristles absent, the second antennal segment grooved above.

Arista plumose, pubescent, bare or pectinate, eyes approximate or widely separated in the males, the front rarely narrowed in both sexes; frontal bristles always present, intrafrontals frequently present; orbitals developed but rarely in the males. Abdomen composed of four segments in the male, five in the female. Male genitalia usually not prominent but sometimes conspicuous; fifth sternal lobes sometimes prominent.

As here understood this family includes the Scatophagidae, Anthomyidae and those Muscidae (of the Williston Manual) lacking hypopleural bristles. In some cases the hypopleura is haired but there need be no question in connection with known North American genera about intergradation with the Metopiidae. There is no means by which the Scatophagidae can be separated from the Anthomyidae, unless the size of the lower lobe of the squamae is used, in which case the genus Anthomyia must be associated with the Scatophagids while many of the other genera
would form a different family. Wing venation is not a character to be
used in separating families in this group, nor can the character of the
plumosity of the arista be used.

The Muscidae are found everywhere and many of them are serious
pests. The raddish maggot, cabbage maggot, onion maggot, seed corn
maggot, and many others take annual toll of our crops. So much has
been written about the house fly as a carrier of disease that only a brief
review need be given here. Others are pests of domestic animals and
also pay attention to man. The Tse-tse flies, formerly considered as
belonging to this family, and not greatly distinct at best, are carriers
of trypanosomes causing sleeping sickness.

Many entomologists believe that the House Fly (Musca domestica)
has been responsible for more human suffering than any other insect
and the evidence in support of this is very strong. It is said that
deaths due to diseases carried by flies have exceeded those caused by
wounds during the wars preceding the world war (1914-1918), whereas
during this latter conflict the mortality from such diseases was neg-
ligible, due to efficient sanitary practices. The House Fly breeds in
manure, garbage and almost any decaying matter and its control con-
sists of the screening and disposal of such material at frequent intervals.
Manure should be kept, as much as possible, either on such a maggot
trap as recommended by Hutchison*, sprayed occasionally with a mix-
ture of one pound of powdered hellebore to twenty gallons of water at
the rate of one gallon of the spray to one cubic foot of manure, or
sprinkled with powdered borax at the rate of one pound to 16 cubic
feet of manure. The borax treatment must not be repeated, the fresh
manure being piled in such a way that it may be treated separately.
All garbage should be destroyed at least twice a week.

Because the House Fly feeds on filth of all kinds and visits our
foodstuffs, alighting with impunity upon the things we would eat, it
is particularly loathsome. It is attracted to almost anything that is
moist, such as sputum, feces, garbage, etc., and may fly directly from
any of these to food used for human consumption. The diseases carried
on its body (in the form of the causative organisms) are Typhoid Fever,
Dysentery, Cholera, Yaws, Anthrax and some forms of Conjunctivitis.
Many other bacteria, some of them undoubtedly capable of causing dis-
ease, are also carried.

In addition to destroying the breeding places of flies efforts should
be made to prevent them from coming in contact with foodstuffs by
screening all buildings. Sickrooms should be particularly well screened
in order to prevent flies from carrying the disease to other individuals.

The Stable Fly (*Stomoxys calcitrans*) is a biting insect and is sometimes known as the Biting House Fly. It is not a general visitor in houses but may be common in yards and on porches near stables, and is most active in the hot sun. It is also a pest on beaches and along streams on bright, sunny days. It breeds in manure and decaying vegetation so may be controlled by measures taken against the House Fly. Domestic animals suffer greatly from its bites and milk production may be greatly reduced when the fly is abundant. The flies enter the stable on cattle and horses and many of them remain there over night. Use of a fly spray in stables will greatly reduce their numbers. The view has been expressed that infantile paralysis is carried by this fly but the accusation has not been proved. However, under certain conditions it may transmit sleeping sickness.

The Horn Fly (*Lyperosia irritans*) so named because of its habit of feeding about the base of the horns of cattle, is also a biting fly. It rarely attacks man.

The classification of this family is still in an unstable condition and it is seldom that two authors use the same generic limits and very frequently different names are used for the same generic concept. Unfortunately several of the genera are not available for study and I have been forced to include about a score of them from descriptions only, while four of those recorded from North America are excluded. A half dozen genera occurring in South America and not yet recognized from our region are keyed out as it is likely that they occur in the tropics. In one or two cases the characters I have used will change the limits of genera, and I have recognized as genera groups sometimes considered to be no more than subgenera.

In order to facilitate the use of the Key I have prepared a synoptic key leading to the main subdivisions employed.

**SYNOPTIC TABLE**

A. With at most one sternopleural bristle. .............................. 1
   With two or more sternopleurals .................................. B

B. Anal vein extending to the wing-margin. .......................... 39
   Anal vein not extending to the wing-margin ...................... C

C. Arista plumose, pubescent or bare ............................... D
   Arista pectinate, without rays below ............................ 144

D. First vein setulose on most of its length ........................ 77
   First vein bare beyond the humeral crossvein .................. E
FAMILY MUSCIDE

E. Pteropleura haired .............................................. 88
    Pteropleura bare ............................................. F

F. One pair of presutural dorsocentral bristles .................. 98
    More than one pair of presutural dorsocentrals ............. 106

KEY TO GENERA.

1. With at most one sternopleural (c. f. Lispoides) .............. 2
    With two to four sternopleurals ............................ 38

2. Pteropleura bare ............................................. 8
    Pteropleura haired ........................................... 3

3. Anterior tibiae without abundant ventral setulae ............. 4
    Anterior tibiae beneath with abundant black setulae  ....... "Alomyella" Malloch

4. First vein bare .............................................. 5
    First vein setulose apically; sixth vein not reaching wing margin.
        Dasypleuron Malloch

5. Sixth vein reaching wing margin ................................ 6
    Sixth vein not reaching wing margin ........................ Eugenacephala Johnson

6. With distinct sternopleural bristle ........................... 7
    Without sternopleural bristle; wings with several brown spots.
        Ernoneura Becker

7. Propleural bristle long and strong; arista short plumose on whole
    length ....................................................... "Megaphthalma" Becker
    Propleural bristle very weak or absent; arista long plumose or bare
        (33) ...................................................... Scopeuma Latreille

8. Head at least as high as long; face at most moderately retreating... 11
    Head decidedly longer than high, the face strongly retreating below... 9

9. Stigmatal bristle absent ..................................... 10
    Stigmatal bristle strong .................................... Paratidia Malloch

10. Third antennal segment with a fine, long hair on the outer surface
    near the insertion of the arista (41) ....................... "Acicephala" Coquillett
    Third antennal segment without such hair  ............... "Pseudacicephala" Malloch

11. Hypopleura never with bristles ................................ 12
    Hypopleura with a row of bristles; costa ending at third vein, the
        fourth vein incomplete; front half as wide as head (Eginiæ).
        (52, 59) ................................................... "Lutzomyia", n. g.

12. Frontal bristles or hair long .................................. 13
    Frontal bristles extremely short, the front nearly bare (40).
        Hydromyza Fallén

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§ Differs from Eginiella Malloch (China) in having the front of the male half as wide as the
head and in lacking bristles on the legs, with the exception of the apical tibial bristles.
Lutzomyia americana, n. sp. from Arizona.
13. Anterior tibiae without a short, rectangular apical spine below. 14 Anterior tibiae with a short, stout, rectangular spine at apex of ventral surface ........................................... *Acanthocnema Becker

14. Anteroventral surface of the anterior femora and tibiae without stout bristles, the front tibiae rarely with a single bristle on this surface. 15 Anteroventral surface of the anterior femora and tibiae with stout bristles ........................................... Norellia Desvoidy

15. Prothoracic bristle always, the stigmatic usually, present. 16 Prothoracic and stigmatic bristles absent. 28

16. Palpi long and slender, armed at the apex with a long, outstanding bristle .......................................... 17 Palpi more or less broadened, without an outstanding bristle. 20

17. Third vein not sinuate. 18 Third vein rather strongly sinuate. Scoliaphleps Becker

18. Stigmatal bristle weak or hair-like, usually absent. 19 Stigmatal bristle strong (46, 60). Cordilura Fällén

19. Eyes round ........................................... Neogymnomera Malloch Eyes with a slight emargination on the lower posterior half. 36


Muscidae 1.—1, Helina lucorum; 2, Schoenomyza chrysostoma; 3, Limosia; 4, 5, Lasiops spiniger; 6, Phyllogaster cordyluroides; 7, 8, Fannia; 9, Ophyra ynesene; 10, Helina; 11, Spilaria; 12, Pseudolimnophora; 13, Pseudolimnophora, antenna; 14, 15, Lispe; 16, Limnphora.
20. Cheeks usually less than one-third the eye-height; face as long as the 21 Cheeks more than half as wide as the eye-height; face shorter than 
front or nearly so.................................................. 21 the front, slightly retreating below; intra-alar bristles absent; 

38. Anal vein extending to the margin of the wing, at least weakly
Anal vein never extending to the margin of the wing
39. Under surface of the scutellum with fine, soft, erect hairs
Under surface of the scutellum bare
40. Three sternopleurals
Two sternopleurals (cf. Fucellia)
41. Upper apex of third antennal segment acute or angulate; scutellum with four bristles
Third antennal segment rounded apically; scutellum with one pair of marginals
42. Arista thickened on basal half, its penultimate segment much longer than wide (43)
Pselaphphila Becker
Arista thickened on basal fourth, its penultimate segment short.
Chetosa Coquillett
43. Three pairs of postsutural dorsocentral bristles
Hexamitocera Becker
Two pairs of postsutural dorsocentral bristles
Cleigastra Macquart
44. Scutellum with one or two pairs of marginal bristles; palpi without long outstanding apical bristle
Scutellum with six marginals; palpi with strong apical bristle
Plethocheta Coquillett
45. First vein bare
First vein setulose on apical third (38)
Orthacheta Becker
46. Anterior femora without strong bristles on the anterior surface
Anterior femora with strong bristles on the anterior surface, propopleura haired
*Amaurosoama Becker


Muscidae II.—17, Pentacricia aldrichi, ? abdomen; 18, Eremomyia humeralis, ? abdomen; 19, Eremomyia humeralis; 20, Neodexiopsis; 21, 22, Hammomya; 23, Coenosia, hind leg; 24, Hylemya, abdomen; 25, Tetracheta unica; 26, Hoplogaster; 27, Pegomya bicolor; 28, 29, Hydrophoria divisa; 30, Platycenosia pokorny; 31, 32, Hylemya.
47. Palpi short, normal .................................................. 48
   Palpi very long; stigmatal bristle strong ......................... Pselaphephila Becker
48. Front with intrafrontal bristles in both sexes .................. 50
   Front without intrafrontal bristles ............................... 49
49. Third antennal segment sharply angulate at upper apex; arista distinctly elbowed .................. Gonatherus Rondani
   Third antennal segment obtusely angulate or rounded; arista never elbowed .................. Mesamyia Malloch
50. Acrosticals strong but short, paired .................................. *Fucellia Desvoidy
   Acrosticals fine, short and irregular ............................ *Myopina Desvoidy
51. Pteropleura bare† .................................................. 54
   Pteropleura with hair or bristles ................................ 52
52. Pteropleura with a single bristle ................................ Emmesomyia Malloch
   Pteropleura with several hairs ................................... 53
53. Propleura bare ...................................................... 58
   Propleura haired on the median portion .......................... §Eremomyioides Malloch
54. Eyes bare ............................................................ 55
   Eyes haired ......................................................... Alliopsis Schnabl & Dziedzicki
55. Propleura bare in the middle ....................................... 57
   Propleura haired on the median portion .......................... 56
56. Arista bare ........................................................... Kingiella Malloch
   Arista distinctly plumose ........................................ 58
   Arista pubescent or bare ........................................ 61
57. Arista plumose ...................................................... 61
   Arista pubescent or bare ........................................ 61
58. Scutellum cinerous, with an opaque black spot on either side. Eustalomyia Kowarz
   Scutellum without opaque black spot on either side ........... 59
59. Lower lobe of the squamae conspicuously longer than the upper (28, 29) .......................... *[Hydrophoria Desvoidy
   Lower lobe of the squamae not as large as the upper ........... 60
60. Proboscis elongate and slender, as long as the thorax or nearly so ........................... 61
   Proboscis short and thick, not nearly as long as the thorax ........................... 62
61. Arista pubescent ..................................................... Proboscimyia Bigot
   Arista long plumose ................................................ Neohylemyia Malloch
62. Hypopleura haired in front of the posterior spiracle. Calythea Schnabl & Dziedzicki
   Hypopleura bare in front of the posterior spiracle ............ 63
63. Anterior tibiae with an extremely long dorsal bristle at the apical fourth in the male and with two or three strong dorsal bristles at the apical fifth in the female .......................... Anthomyella Malloch
   Anterior tibiae without such bristles ........................... 64

† The genera in couples 51 to 74 comprise the Anthomyinae. Keys to the Eastern species will be found in Hucet, Cornell Uni. Agr. Exp. Sta. Mem. 77.
‡ Malloch, 1920, Can. Ent. lili, p. 76.
†† Malloch, 1929, Can. Ent. lili, p. 103.
Muscidae III.—33, Scopecuma; 34, Spaziphora; 35, Cyrtoneurina; 36, Cyrtoneuropsis rescita; 37, Myospila meditabunda; 38, Orthacheta; 39, Achellessa varipes; 40, Hydromyza confluens; 41, Acicephala polita, hair on third antennal segment not shown; 42, Morellia; 43, Pselaphelphila; 44, Morellia; 45, Graphomya maculata.
64. Facial depression with almost parallel sides on more than the lower half or conspicuously narrower between the vibrissae than at the middle .............................................. 65
Facial depression widening below, wider at the vibrissae than at a point above the middle .............................................. 66
65. No bristly hairs on posteroventral surface of posterior tibiae in male; ovipositor not terminating in two or more spines (27).

*Pegomya Desvoidy

A series of long hairs on posteroventral surface of posterior tibiae; ovipositor bearing two or more apical spines (21, 22).

Hammomya Rondani

66. Antennae separated from each other by a distinct elevation which continues onto the face.............................................. †Egle Desvoidy
Antennae not conspicuously separated from each other at the base.... 67
67. Oral margin strongly produced, the hairs surrounding the vibrissae extending well onto the sides of the face............Macateceia Malloch
Oral margin not unusually produced, the hairs not extending onto the face .............................................. 68
68. Middle tibiae with anteroverentral bristle near the middle.

Paregle Schnabl & Dzedzicki

Middle tibiae without such bristle.............................................. 69
69. Three pairs of postsutural dorsocentrals.............................................. 70
Four pairs of postsutural dorsocentrals............Macrophorbia Malloch
70. Proboscis unusually stout..............................Pycnoglossa Coquillet)
Proboscis not unusually robust.............................................. 71
71. Posterior tibiae with two long bristles near the middle, on the upper surface, each at least half as long as the tibia...Prosalpia Pokorny
Posterior tibiae without such bristles.............................................. 72
72. Sides of the scutellum with more than a single row of hairs below the marginals; interfrontals absent in both sexes; posthumeral and anterior sublateral bristles equally strong (18, 19).Eremomyia Stein
Not with this combination of characters.............................................. 73
73. Eyes of males broadly separated; acrosticals hair-like and short.

Chirosia Rondani

Eyes of males approximate, very rarely separated by much more than the distance between the posterior ocelli.............................. 74
74. Posterior tibiae without posterodorsal bristles, or with two (27).

‡Pegomya Desvoidy
Posterior tibiae with one posterodorsal bristle or with more than two (24, 31, 32).............................................. §Hylemya Desvoidy
75. Arista plumose, pubescent or bare.............................................. 76
Arista pectinate, with rays on the upper side.............................. 144
76. First vein setose, on most of its length.............................................. 77
First vein bare, or with setulae only before the humeral crossvein.... 82

† Malloch, 1929, Can. Ent., liii, p. 77.
77. Apex of posterior coxae haired behind..................Chaetogenia Malloch
    Posterior coxae bare behind............................................. 78
78. Prosternum setose....................................................... 80
    Prosternum bare.......................................................... 79
79. Arista short plumose ................................................... 78
    Arista long plumose (36)...............................................Steinella Malloch
    Cyrtoneuropsis Malloch
80. Fourth vein curved forward apically.............................. 81
    Fourth vein not curved forward apically............................Smithomyia Malloch
81. Posterior tibiae with a strong posterodorsal bristle near the apical
    third .................................................................Paeilophanaonia Malloch
    Posterior tibiae without calcar (35)...............................Cyrtoneurina Giglio-Tos
82. Pteropleura haired .................................................... 83
    Pteropleura bare ........................................................ 97
83. Propleura haired in the middle .................................. 84
    Propleura bare in the middle ....................................... 85

84. Fourth vein ending well before the apex of the wing........Musa Linnaeus
    Fourth vein ending well behind the apex of the wing.Mallocharia Curran
85. Proboscis tapering from the base, long, adapted for biting (as in
    Stomoxys) ..............................................................Haematobosca Bezzi
    Proboscis short and stout, the labella large................... 86
86. Ridge at inner edge of lower squamal lobe bare................ 88
    Ridge at inner edge of lower squamal lobe with hairs........ 87
87. Fourth vein ending before the wing-tip..........................Orthellia Desvoidy
    Fourth vein ending behind the wing-tip (51, 54).............*Philornis Macquart
88. Fourth vein ending distinctly behind the wing-tip...............90
    Fourth vein ending distinctly before the wing-tip...............89
89. Middle tibiae with a strong anteroventral bristle beyond the middle.
    Pyrellia Desvoidy
    Middle tibiae without anteroventral bristle beyond the middle (42, 44).
    †Morellia Desvoidy

90. Prosternum bare .................................................. 93
   Prosternum haired .................................................. 91
91. First vein with setulae opposite the humeral crossvein...Clinopera Wulp
   First vein bare above on the whole length.................. 92
92. Facial depression extremely deep, with almost parallel sides; cheeks
   wide (49, 53)...........................................Charadreia Wulp
   Facial depression very shallow, widening below; cheeks narrow (55).
   Dichotomia Malloch
93. Palpi spatulate, flattened, always strongly widening apically (14, 15).
   Palpi not unusually widened, not flattened apically........ 94
94. Calcar present .................................................... 95
   Posterior tibiae without strong posterodorsal bristle beyond the middle.101
95. Fourth vein very strongly curved forward at the apex........ 96
   Fourth vein not curved forward at the apex...Pseudophaonia Malloch
96. Third and fourth veins equidistant from the wing-tip.
   Hypodermodes Knab
   Fourth vein ending far behind the wing-tip......Mesembrina Meigen
97. A single pair of presutural dorsocentral bristles............ 98
   Two pairs of presutural dorsocentrals or they are absent... 106
98. Lower lobe of the squamae much longer than the upper........100
   Lower lobe of the squamae scarcely longer than the upper... 99
99. Front decidedly longer than wide (26)...........†Hoplogaster Rondani
   Front wider than long, narrowing anteriorly (2)..........†Schoenomyza Haliday
100. Costa extending to the fourth vein..........................101
    Costa ending at the third vein or a little beyond......Allognota Pokorny
101. Three postsutural dorsocentrals..............................102
   Two pairs of postsutural dorsocentrals......................Bithoracochaeta Stein
102. Posterior tibiae with three long median bristles, one on the postero-
   dorsal surface although this latter may be short............103
   Posterior tibiae without a single posterodorsal bristle at the middle,
   sometimes with two posterodorsals............................ 104
103. Anterior tibiae with an anterodorsal beyond the middle.
    Macrocoenosia Malloch
    Anterior tibiae without an anterodorsal bristle (20).‡Neodexiopsis Malloch
104. Posterior tibiae with an anteroventral bristle.............105
    Posterior tibiae without an anteroventral bristle....‡Xenocoenosia Malloch
105. Posterior tibiae with a long anterodorsal and long anterior bristle
    situated very close to each other (23)...........§Coenosia Meigen
    Posterior tibiae with anterodorsal and anteroventral bristle, their
    bases not close together (3).........................§Limosia Desvoidy

106. Sternopleural bristles situated in a nearly equilateral triangle, almost always three in number.

107. Sternopleurals not forming a nearly equilateral triangle, if only three are present the lower one is decidedly farther from the anterior.

108. Anterior tibiae with a posterior bristle near or beyond the middle.

109. Anterior tibiae without posterior bristle except at apex.

Dorsocentrals very weak, poorly differentiated...Atherigona Rondani

Dorsocentrals strong

108. Anterior tibiae with a posterior bristle near or beyond the middle.

Lispocephala Pokorny

109. Anterior tibiae without posterior bristle except at apex.

Four sternopleurals, the posterior three in a straight line.

Macrorchis Rondani

Three sternopleurals

110. Posterior bristle on front tibiae very long, situated before the middle.

Dialyta Meigen

Posterior bristle on front tibiae short, situated beyond the middle.

Limnospsila Schnabl

111. Sixth vein very short, the seventh curved strongly forward so that it would bisect the sixth only a little beyond the end of the latter.

Sixth vein not unusually short, the seventh never curved so that it would bisect the sixth.
112. Posterior tibiae with dorsal bristle near or somewhat beyond the middle, or with two posterodorsal bristles. Ariciella Bdellolarynx...
113. Eyes of male very broadly separated; posterior tibiae sometimes with two posterodorsal bristles and without the dorsal. Lasiops Stein. Euryomma Stein. Eyes of male approximate, the front at least narrowed; dorsal tibial bristles always present (7, 8). *Fannia Desvoidy
114. Proboscis long and narrow, widened basally, adapted for blood-sucking. Bdellolarynx Austen. Proboscis short and thick, the labella fleshy. *Fannia Desvoidy
115. Prosternum bare. Muscina Desvoidy
116. Prosternum haired laterally. Dendrophaonia Malloch
117. Prosternum bare. Dendrophaonia Malloch
118. Posterior thoracic spiracle long and narrow. Synthesiomyia Brauer & Bergenstamm
119. Third vein with setae basally on the upper margin or before the furcation. Myospila Rondani
120. Lower lobe of the squamae large, its inner end reaching the base of the scutellum. Graphomya Desvoidy
121. Basal abdominal sternite bare. Limnophora Desvoidy
122. Basal abdominal sternite with several hairs. *Fannia Desvoidy
123. Basal abdominal sternite with several hairs. Pseudolimnophora Schnabl
124. Fourth vein with setae basally on the upper margin or before the furcation. Muscina Desvoidy
125. Eyes pilose (4, 5). Lasiops Meigen
126. Eyes pilose (4, 5). Allocostylus Schnabl
127. Eyes bare. Allocostylus Schnabl
128. Fourth vein ending far behind the wing tip, not conspicuously curved forward apically. Dendrophaonia Malloch
129. Fourth vein ending far behind the wing tip, not conspicuously curved forward apically. Dendrophaonia Malloch
130. Fourth vein ending far behind the wing tip, not conspicuously curved forward apically. Dendrophaonia Malloch
131. Fourth vein ending far behind the wing tip, not conspicuously curved forward apically. Dendrophaonia Malloch
132. Fourth vein ending well behind the tip of the wing. Dendrophaonia Malloch
133. Fourth vein ending well behind the tip of the wing. Dendrophaonia Malloch
134. Posterior spiracle twice as long as wide, with black hairs extending over the lower flap. Muscina Desvoidy
135. Posterior spiracle not nearly twice as long as wide. Bigotomia Malloch
136. Posterior tibiae, posterodorsally, bare or with two or more bristles. Lasiops Meigen
137. Posterior tibiae with only the calcar, rarely with a very short posterodorsal bristle near the base. Dendrophaonia Malloch
138. Cheeks below with two to five upwardly curving bristles on the anterior half. Dendrophaonia Malloch
139. Cheeks with at most one upwardly curving bristle. Dendrophaonia Malloch

§ Malloch, 1920, Can. Ent., iii, p. 272 (Trichopticus)
129. Front with an outwardly directed orbital bristle, wide in both sexes (30) .................................................. Platycerusia Strobl
Front without true orbital bristles, or they are not divergent; usually narrow in males.................................................. 139

130. Parafrontals polished; frontal lunule shining white; thorax and abdomen without pollen (9) ........................................... *Ophyra Desvoidy Parafrontals pollinose on most of their length............................. 131

131. Hypopleura haired below the spiracle (11).
†Spilaria Schnabl & Dziedzicki Hypopleura bare below the spiracle............................. 132

132. Hypopleura haired in front of the spiracle (1, 10) .......... †Helina Desvoidy Hypopleura bare in front of the spiracle............................. 136

133. Arista pubescent ............................................................. 134
Arista with long rays (48, 50) .......................................................... ‡Phaonia Desvoidy
134. Hypopleura bare in front of the spiracle............................. 135
Hypopleura haired in front of the spiracle .............. Achetina Malloch

135. Prealar more than half as long as the following bristle.
‡ Malloch, 1923, Tr. Amer. Ent. Soc., xlvii, pp. 239—.

Prealar less than half as long as the following bristle.
§Hydrotaea Desvoidy

Muscidae V.—54, Philornis spermophila; 55, Dichetomyia; 56, Myospila meditabunda;
57, Ceratinostoma ostiorum; 58, Muscina stabulans; 59, Lutzomyia latifrons; 60, Cordilura.
136. Arista plumose (short in Dendrophaonia) ........................................ 137
Arista pubescent .......................................................... 139

137. Cheeks below with two or more strong, upcurved bristles on the anterior half ..........Dendrophaonia Malloch
Cheeks without outstanding, upcurved bristles below, though usually with upcurved hairs .......... 138

138. Eyes of males with enlarged facets in front on the upper part and quite evidently flattened; posterior tibiae without posterodorsal bristles, the front tibiae bristleless; small species, the females shining ........................................... *Hebecnema Schiner
Eyes of males not strikingly flattened; usually larger species (1, 10).
†Helina Desvoidy

139. Cheeks half as wide as the eye-height, with bristles along the oral margin (6) ..........Phyllogaster Stein
Cheeks narrower, with hair on lowest three-fourths or more .......... 140

140. Fourth vein conspicuously curved forward apically. Neomuscina Townsend
Fourth vein at most weakly curved forward apically .......... 141

141. Prealar bristle absent ........................................... 143
Prealar bristle present ........................................... 142

142. Lower squamal lobe produced inwardly (51, 54) §Philornis Macquart
Lower squamal lobe small and not produced inwardly.
†Pogonomyia Rondani

143. Two strong intra-alar bristles ..........Lispoides Coquillett
At most one weak intra-alar ........................................ Pogonomyioides Malloch

144. Proboscis elongate and horny .......... 145
Proboscis short and thick, the labellae fleshy ..........Hemichlora Wulp

145. Palpi short ........................................... Stomoxys Geoffroy
Palpi very long and narrow .......... Hæmatobia St. Fargeau & Serville

* This genus cannot be distinguished from Helina with any degree of success and should no doubt be united with it.
† Malloch, 1920, Can. Ent. liii, p. 103.
‡ Malloch, 1923, Can. Ent. lvi, p. 11.

Scopeuma furcata Say.
Family Gasterophilidæ—The Horse Bot Flies

Gasterophilus intestinalis, wing and part of head showing antennæ.

Flies of moderate size, without bristles, the thorax pilose; mouth parts very small; apical crossvein absent.

Head short and deep, pilose; front broad; antennæ small, situated in deep pits separated by a carina; second segment without groove; arista bare; mouth parts very small, the palpi swollen, though short, larger than the proboscis; ocelli present. Scutellum large; postscutellum absent. Legs of moderate length. Apical crossvein absent, the vein closing the discal cell also absent and the fourth and fifth veins evanescent apically. Squamae small. Abdomen elongate oval in the male, slightly tapering, in the female tapering apically, the ovipositor large and protuberant.

The bot flies are frequently serious pests of horses and may be collected in the neighborhood of these animals, although they are remarkably good fliers. The larvae live in the stomach, throat and nasal passages of horses and related animals and reports of their occurrence in other animals are very rare. The eggs are laid by G. intestinalis on the legs or shoulders of the victim and are taken into the mouth when the animal licks these parts; G. veterinus lays its eggs on the underside of the head and it is believed that the larvae make their way through the skin and into the mouth and thence to the pharynx where they attach themselves. G. hemorrhoidalis lays its eggs about the lips of the horse and the young larvae pass to the rectum where they fasten themselves to the walls. Horses apparently recognize the flies, at least those of veterinus, and it is not an uncommon sight to see horses with their heads resting on each other's backs as a protection against egg laying.

Gasterophilus has usually been placed in the Östridae but Girschner long since pointed out that it was more closely related to the Museidæ (Anthomyidæ) and it has been included in that family. Other
authorities have placed it in the Acalypterae where it would seem to belong on account of the shape of the second antennal segment. However, the species possess strong posterior calli and it is possible that the family is, despite the antennal character, more nearly related to the Muscidae.

The family contains but one genus, Gasterophilus Clark, and there are three North American species.

**KEY TO THE NEARCTIC SPECIES OF GASTEROPHILUS**

1. Wings with dark spots..............................intestinalis Degeer
   Wings without dark spots........................................ 2

2. Discal cell closed beyond the first basal cell; apex of abdomen broadly reddish pilose ........................................ hæmorhoidalis Linnaeus
   Discal cell closed almost opposite the end of the first basal cell; basal cells of equal length; abdomen with whitish pile crossed by a black median band ..................................................veterinus Clark
Family Metopiidae—The Flesh Flies

Sarcophaga sarraceniae.

Flies of medium to moderately small size, the abdomen usually dark and tessellate or metallic green or blue.

Front in both sexes broad, usually somewhat narrowed in the males, rarely very narrow; face variable; vibrissae present; antennae long or short, the arista plumose, pubescent or bare. Abdomen composed of four segments in the males, the fifth short in the females; abdominal bristles usually strong, at least on the apical segments. Hypopleura with a row of bristles; postscutellum developed only in Mesembrinella. Apical cell usually open, rarely closed and petiolate, usually ending far before the apex of the wing.

As here considered this family comprises the Sarcophagidae, part of the Muscidae and part of the Tachinidae of Williston’s Manual. The absence of the postscutellum distinguishes it from the Tachinidae while the presence of hypopleural bristles separates it from the Muscidae and the well developed mouth parts from the Õestridae. A study of pupal and larval characters indicates that the association of the genera now included in the family is a natural one, although the genus Mesembrinella is a doubtful member.

Insofar as known the larvae are flesh feeders, parasites or scavengers on excrement and all have the posterior spiracles situated within a deep depression.
As indicated in the introduction I consider *Myasis* in man is generally an accidental occurrence. There is evidence that it may occur under conditions where an open wound is not dressed and incidents of this kind were not rare during the World War. Indeed, the condition of maggot-infested wounds led to the discovery of the value of flies as an aid in curing serious wounds and also in the treatment of *Osteomyelitis*. It is true that some medical men express doubt about the efficacy of the maggot treatment of this disease but the evidence seems to be in its favor. The maggots feed, for the most part at any rate, only on decayed tissue and the bacteria present in the wound. Whether healing results from the consumption of bacteria or the secretion of a substance stimulating the growth of new flesh is immaterial.

The larvae of the Screw Worm Flies (*Cochliomyia macellaria* and *americana*) occasionally attack man. The eggs are laid in open wounds or nasal or other discharges from the body and the larvae quickly bore into healthy tissue. From fifty to more than two hundred eggs may be laid at a time. There have been a number of fatal cases in the United States while, in the tropics, death from the attacks of the maggots is said to be not rare. Sheep and range animals are normally attacked when wounded or when the wool becomes fetid due to filth.

The classification of the group is in chaotic condition. A great many genera have been proposed upon characters possessed by one sex or the other and upon characters which are apparently of not more than specific or group value and which, when large collections are studied, are found to be entirely unsatisfactory. There are no doubt several North American genera not included in the key but, without specimens, it is impossible to locate them. I have included all the North American genera known to me but am acquainted with several others occurring in South America which may possibly occur in the North American Tropics although there are, as yet, no records.

There are three papers which will be found most useful in the study of the insects belonging to this family, published by Aldrich*, Allen† and Shannon‡. In the former many of the specific names have been replaced by older names as the result of a study of the types of species described by older authors. For these corrections see Aldrich*

It is unfortunate that the name of this family must be changed to Metopidae, but since there has been no previous grouping of the included genera into a single family the shock should not be great. The basic use of *Miltogramma* for tribal name has always been erroneous

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and the same is true of Calliphora as Onesia has page priority. Since Sacrophaga was proposed long after Metopia and Calliphora the name could scarcely be used in any event.

KEY TO GENERA

1. Arista pubescent or bare ........................................ 2
   Arista plumose ................................................... 23

2. First vein bare ................................................... 3
   First vein setose .................................................. Opisdiopsis Townsend

3. Apical cell closed ................................................. 4
   Apical cell open ................................................... 6

4. Distal section of the fifth vein longer than the penultimate section
   (16) ........................................... Taxigramma Perris
   Distal section of the fifth vein little more than half as long as the
   penultimate section ............................................. 5

5. Apical cell ending far before the wing tip, short petiolate (19).
   Hilarrella Rondani
   Third vein ending only a little before the wing tip, the apical cell long
   petiolate (4, 30) ........................................ Phytodes Townsend

6. Facial ridges without bristles or they are short and hairlike, the
   parafacials often bristly ........................................ 7
   Facial ridges with bristles on lower half or more (12) .......... 6a

6a. Arista thin on apical third ..................................... Sphenometopa Townsend
   Arista wholly thickened (2, 12) ................................ Euaraba Townsend

7. Parafacials with only fine hair, without bristles, or with only one below. 11
   Parafacials with a row of bristles (cf. Camptopyga) ........... 8

8. Antennæ reaching almost to the oral margin .................... 9
   Antennæ very short, the third segment scarcely longer than the second
   (5, 9) .................................................. Neophyto Townsend

9. Facial ridges divergent below, the depression wider than parafacial .... 10
   Facial ridges with parallel sides, the depression deep, narrow and not
   as wide as either parafacial (18) ................................ Opsiidea Coquillett

10. Third antennal segment not more than twice as long as the second; face
    not strongly receding (10) .................................... Brachicoma Rondani
    Third antennal segment more than three times as long as the second;
    face very strongly receding (1, 20) ......................... Metopia Miegen

11. Apical cell ending in the wing tip ................................ Opelousia Townsend
    Apical cell ending far before the wing tip .................... 12

12. Head at vibrissæ much shorter than at base of antennæ, the oral margin
    not produced .................................................. 13
    Head at vibrissæ almost or quite as long as at base of antennæ, the
    oral margin usually prominent ................................ 17

13. Abdominal bristles strong ..................................... 14
    Abdominal bristles poorly differentiated from the hair; abdomen sub-
    globose ..................................................... Estrohilarella Townsend

14. Frontals not extending below the base of the antennæ ............ 15
    Frontals descending to the middle of the second antennal segment.
    Phrosinella Desvoidy
Metopidae II.—13, Hemilucilia; 14, Pollenia rudis; 15, Mesembrinella; 16, Taxigramma; 17, Senotainia; 18, Opsidea; 19, Hilaria; 20, Metopia leucocephala, ♀; 21, 22, Pachyophthalmus; 23, Pollenia rudis; 24, Camptopyga; 25, Sarcophaga; 26, Raviniopsis; 27, Senotainia; 28, Opsodexia; 29, Camptopyga; 30, Phytodes herculus.
15. Third vein usually bristled half way to the crossvein or the arista thickened on not more than the basal half.  
Third vein with only one to three small basal setulae, the arista thickened on almost its whole length; third antennal segment five times as long as second.  

15a. Vibrissae situated level with the anterior oral margin.  
Ouelletia, n. g.  
Vibrissae situated almost the length of the second antennal segment above the oral margin.  
Eusenotainia Townsend

16. Three pairs of almost equally strong marginal scutellars.  
Gymnoprosopa Townsend  
Apical pair of scutellars weak or absent.  
Eumacronychia Townsend

17. A row of proclinate hairs on the parafrontals close to the frontals (21, 22).  
Pachyophthalmus Brauer & Bergenstamm  
No such row of hairs, the parafrontals sometimes haired over most of the surface or bearing one or more pairs of orbitals.  

18. Costal spine very long and strong; two pairs of strong scutellars (21, 29).  
Camptopyga Aldrich

Costal spine short  

19. Parafacial hairs conspicuous, moderately long  
Parafacial hairs inconspicuous, very short  

20. Second abdominal segment with erect median marginals  
Second abdominal segment without median marginals.  
Wohlfahrtia Brauer & Bergenstamm

21. Frontals not descending below the base of the antennae.  
Amobia Desvoidy  
Frontals descending below the base of the antennae and divergent below (10).  
Brachicoma Rondani

22. Three pairs of almost equally strong scutellars (17, 27).  
Senotainia Macquart  
Apical scutellars very much weaker than the other two pairs.  
Eumacronychia Townsend

23. Fifth vein bare  
Fifth vein bristled (6, 8).  
Johnsionia Coquillett

24. Lower lobe of the squamae haired above at least on basal half  
Lower lobe of the squamae bare or pubescent above  

25. Propleura pilose  
Propleura bare  
Adiscochaeta Enderlein

26. First vein setose posteriorly before the humeral crossvein.  
*Paralucilia Brauer & Bergenstamm  
First vein not setose posteriorly  

27. Abdomen metallic blue or green  
Abdomen black in ground color, tessellate  
Squamatoides Curran

28. One sublateral bristle  
Two or three sublateral bristles  
Cynomya Desvoidy  
*Calliphora Desvoidy

* Chrysomya desvoidyi belongs here.  
† Steringomyia Pokorny is a synonym and Onesia Desvoidy is very doubtfully distinct.  
If the two genera are united Onesia will have priority.
29. First vein setose posteriorly between the humeral crossvein and base of the wing ............................................. 30
First vein bare posteriorly ............................................. 37
30. First vein setulose below as well as above ............................................. 31
First vein bare below ............................................. 32
31. Postsutural acrosticals absent ............................................. Sarconesia Bigot
Postsutural acrosticals present ............................................. Sarconesiopsis Townsend
32. Face yellow, clothed with yellow hairs ............................................. 33
Face black, the hairs black ............................................. 35
33. Palpi short and slender ............................................. Cochliomyia Townsend
Palpi long, normal ............................................. 34
34. Vibrissae situated the length of the second antennal segment above the oral margin (13) ............................................. Hemilucilia Brauer
Vibrissae almost on a level with the oral margin ................................ Chloroprocta Wulp
35. Aristal rays quite short and appressed; head almost as long as high. Boreillus Aldrich & Shannon
Aristal rays long, not appressed; head decidedly higher than long ............................................. 36
36. Upper lobe of the squamae haired above ............................................. *Phormia Desvoidy
Upper lobe of the squamae haired only on the margin. Protocalliphora Hough
37. Antennae very short, the third segment little longer than the second; face receding below, the vibrissae closely approximate. Neophyto Townsend
Antennae elongate ............................................. 38
38. Suprasquamal ridge with erect black hairs ............................................. 39
Suprasquamal ridge bare or pubescent ............................................. 40
39. Subcostal sclerite setulose ............................................. Lucilia Desvoidy
Subcostal sclerite bare ............................................. Phenicia Desvoidy
40. Thorax with abundant yellow tomentose hairs among the black hairs (14, 23) ............................................. Pollenia Desvoidy
Thorax without tomentose hairs ............................................. 41
41. Postscutellum strongly developed; propleura bare; prosternum setulose laterally; bend of fourth vein broadly rounded (15). Mesembrinella Giglio-Tos
Postscutellum not developed ............................................. 42
42. Three or more sternopleurals ............................................. 50
Two sternopleurals ............................................. 43
43. Fourth vein ending almost in the tip of the wing ............................................. 44
Fourth vein ending well before the tip of the wing ............................................. 45
44. Arista long plumose (7, 28) ............................................. †Oposodexia Townsend
Arista short plumose ............................................. Opelousia Townsend

* Protophormia Townsend is separated by the absence of strong acrostical bristles but the character is of not more than specific value in this instance, some specimens possessing distinct acrosticals.
45. Abdomen largely pollinose
Abdomen shining black.................................Phrissopodia Macquart
46. Hairs on sides of the scutellum extending to the lower edge..............47
Scutellum without hairs outside the marginals..............Camptops Aldrich
47. Middle of propleura bare................................49
Middle of propleura haired................................48
48. Frontal bristles not extending below the base of the antennae. Harpagopyga Aldrich
Frontal bristles extending below the base of the antennae and diverging below..............................................Notochata Aldrich
49. Parafacial hairs inconspicuous; large species..............Sthenopyga Aldrich
Parafacial hairs evident; small species........................................58
50. First vein not setose............................................................51
First vein setose (3)............................................................50
51. Propleura haired on median portion..........................................................52
Propleura bare..................................................................53
52. Third antennal segment but little longer than the second; arista short
plumose; both sexes with orbitals...............................Harbeckia Aldrich
Third antennal segment usually twice as long as the second; males
without orbitals (Bettcheria Parker) (25)..........................Sarcofagula Meigen
53. Sternopleurals arranged in a nearly equilateral triangle.........................54
Sternopleurals not arranged in a nearly equilateral triangle...........55
54. Costal spine long and strong......................................................57
No costal spine ..................................................................58
55. Third antennal segment more than twice as long as the second; cheeks
less than half as wide as eye-height; parafacials rarely with more
than two rows of hairs.........................................................56
Third antennal segment less than twice as long as the second; cheeks
more than half as wide as eye-height; parafacials with several irregular
rows of hairs.................................................................Emblamasoma Aldrich
56. Arista with several rows of hairs dorsally and a single row of shorter
hairs ventrally; vibrissae situated far above the oral margin (26). Raviniopsis Townsend
Arista normally plumose ......................................................57
57. Front of male with one or two orbitals; at most a single hair on the
notopleura in addition to the two bristles; fourth vein ending rather
near the apex of the wing..................................................58
Front of male without orbitals; always more than a single hair on the
notopleura in addition to the two bristles or the sternopleurals are
all strong and the fourth vein ends far before the apex of the wing
(25)........................................................................Sarcofagula Meigen
58. Parafacials with two or three rows of hairs; metacephalon swollen.
Sarothromyia Brauer & Bergenstamm
Parafacials with a single row of hairs; metacephalon not conspicuously
swollen ...............................................................Sarcofagula Wulp

* If there are orbitals in the male see Sarcofagula.
† In some species the males have the propleura haired while the females do not.
Ouelletia, new genus

Rather similar to Senotainia but the facial ridges are haired on almost the lower half, the arista is wholly thickened and the face re-treating. Differs from Eusenotainia in having the vibrissae more widely separated and situated level with the anterior oral margin. Differs from Euaraba in the haired facial ridges and much narrower frontal vitta. Front three-fourths as wide as either eye, slightly more than one-third as wide as the head, the parafrontals wider than the vitta, frontals ending at base of antennae; two pairs of orbitals in the male and a reclinate frontal in the orbital row, ocellars long; outer verticais weak. Cheeks one-fifth as wide as the eye-height. Parafacials wide, setulose on upper half. Palpi of moderate length. Facial depression very deep. Antennae elongate, the third segment very long and broad; arista wholly thickened, the penultimate segment short. Aerosticels 1-1, weak, dorso-centrals 2-3, the front ones fine; three pairs of marginal scutellars; sternopleurals 1-1. Bend of fourth vein with a slight fold; base of third vein with a single bristle. Squamae produced inwardly. Abdomen oval, without discals, the apical two segments with weak marginals. Black, with whitish pollen; frontal pollen mostly brownish yellow, the mesonotal pollen with brownish yellow tinge. Abdomen with a broad median dark vitta and large black triangles on the second and third segments. Genotype, O. aristalis, new species, from Lauzon, Quebec, June.

Phrissopodia præceps Wiedemann.
Family Cuterebridae—The Robust Bot Flies

Flies of large size, the hair very short, sparse except on the thorax; squamae large; metascutellum not at all developed.

This family differs from the Oestridae in having the scutellum elongate, the postscutellum entirely undeveloped, the arista is usually plumose or pectinate, the form is generally more robust and the body less evidently hairy. In addition the oral opening is larger, sub-triangular (produced in front toward the vibrissal angles) and the palpi are always small.

The remarks concerning the Oestridae apply fairly well to this family. These flies are, in North America at least, mostly parasitic upon rodents and they have been reared from rabbits, rats, mice and squirrels. The larvae have been found along rabbit runs, but the adults are only infrequently encountered.

It seems probable that this family is an offshoot of the Metopiiidae type rather than of the Tachinid stock as is evidenced by the absence of the postscutellum and the usually feathered arista. There does not seem to be a close relationship between these insects and the Oestridae despite the similar habits and reduced mouth parts while the Gasterophilidae are still further removed, coming, as they do, close to the Muscidae. The Tachinidae having reduced mouth parts have more or less distinct abdominal bristles.

Probably the most unusual habit in the insect world is that of Dermatobia hominis (cyamiventríis), the human bot fly. The fly lays its eggs on other insects, usually mosquitoes, and they are carried by the latter to the host. The eggs contain mature first stage larvae and these emerge from the eggs when the carrier begins feeding and pene-
trate the skin. The maggots remain in the host for from forty-five to fifty-five days and cause rather severe muscular pains as well as inducing drowsiness. It is said that the adult flies lurk in the vicinity of mosquito infested pools and capture the mosquitoes as they emerge, laying from ten to thirty eggs on each. I have seen mosquitoes heavily laden with the eggs. Ticks and species of Muscidae are also carriers.

KEY TO GENERA

1. No facial carina; antennae elongate, the third segment three times as long as wide .................................................. 2
   Facial carina developed, though low; antennae short, the second segment rarely over twice as long as wide ........................................ 3

2. Arista rather thickly long plumose ......................... Pseudogametes Bischof
   Arista with rays on upper side only (1, 2, 4) .................. Dermatobia Brauer

3. Arista bare (South America) ..................................... Rogenhofera Brauer
   Arista pectinate above and usually with one or more rays below on the apical part (3, 5, 6) .............................................. *Cuterebra Clark

* I can find no character by which to separate Bogeria Austen, described from a damaged specimen lacking the aristal rays and based upon the bare arista. Townsend (Ins. Ins. Mens., v, p. 23) attempts to separate the two genera on the shape of the facial depression but I cannot follow him in this.

Cuterebridae. — 1, Dermatobia cyaniventris; 2, Dermatobia; 3, Cuterebra, antennae; 4, Dermatobia, tarsus; 5, Cuterebra, tarsus; 6, Cuterebra.
Family *Œstridae*—The Bot Flies

Flies of moderate to large size, thick set and for the most part more or less pilose, the squamae large.

Head large, the lower part more or less swollen; mouth opening small, the mouth parts reduced in size, very small. Front broad in both sexes, widening anteriorly in the male; ocelli present. Antennae short, composed of three segments, decumbent and partly sunken in the facial depression or antennal grooves; arista bare. Eyes bare, rather small. Thorax robust, with transverse suture; hypopleura bearing dense, long hair. Abdomen short, conical or but little elongate; genitalia hidden. Squamae large. Wing venation as in the Tachinidae, the first vein ending beyond the middle of the wing, the auxiliary vein long and ending in the costa; fourth vein ending before the apex of the wing, close to the third; both basal cells present, the second basal and anal cell short.

The *Œstrids* are not common in collections and good series of all but a very few species are unusual. The adults are remarkably good fliers, are excellent hoverers and extremely difficult to catch as well as being rarely encountered. Some collectors have had success in locating larvae and pupae in pastures, and rearing the adults. Otherwise one usually runs across them only by accident.

In some cases the eggs are laid on the hind legs, the larvae working their way under the skin and through the muscles until they reach the back, where they make an opening through which to breath. The larvae of some species live in the nasal sinuses and, in sheep, are responsible for “staggers”. The exact means by which some of the species reach their feeding places is not known, and, in fact, relatively little is known about most species which have been described.

In America the larvae of *Œstrus ovis* have been formed in the eye of man. Normally the living larvae are deposited in the nostrils or eyes of sheep, the fly dashing in and depositing a maggot. The larvae work their way to the nasal sinuses and mature the following spring when they either drop out or are ejecting during sneezing. In man they have been found only in the eye, larviposition probably having taken place as described for sheep. However, there are no records of the victim having been aware of the attack so it is possible that the larva was deposited while the victim was sleeping.
The literature dealing with the family is scattered and a thorough revision of the American species is badly needed. The genitalia of both sexes furnish good taxonomic characters.

It is not an easy matter to decide the relationship of this family but it seems probable that it originated from Tachinid stock, since the postscutellum is strongly developed, and the scutellum usually short and broad. The Tachinidae with reduced mouth opening and mouth parts are more or less bristled and are consequently easily distinguished. However, as these are inhabitants of the Old World tropics we need not discuss them here. More is said about the affinities of the old family *Estridae* under the *Cuterebridae*.

**KEY TO GENERA**

1. Apical cell closed and petiolate..........................*Œstrus* Linnaeus
   Apical cell open........................................... 2

2. Facial grooves only narrowly separated below (2). ... *Cephalemya* Latreille
   Facial grooves very broadly separated.................... 3

3. Palpi absent; scutellum bare on apical third (3)....... *Hypoderma* Clark
   Palpi small, globular; scutellum pilose apically (1)..... *Œdamagena* Latreille

*Œstridae*.—1, *Œdemagena* tarandi; 2, *Cephalemya* abdominalis; 3, *Hypoderma* lineatum.
Family Tachinidæ—The Tachinids

Small to rather large flies, the thorax with bristles, the head and abdomen generally with bristles.

Head variable in size, sometimes narrower than the thorax, at other times conspicuously wider; both sexes dichoptic although the eyes of the males are sometimes closely approximated, rarely so in the females; front often wide in both sexes, usually wider in the female than in the male of the same species; frontal bristles almost always present, orbital bristles usually present in the females and often in the males; ocellars present or absent; outer verticals present or not distinguishable from the postocular cilia; cheeks variable in width; oral margin variable, sometimes strongly produced, at other times receding; oral vibrissæ usually present; proboseis variable in length and thickness, sometimes very elongate, on the other extreme very small; palpi present or absent; antennæ variable, consisting of three segments, the second with a longitudinal seam above on the outer side and usually bearing stout hairs and one or more bristles; arista composed of two or three obvious segments, plumose, pubescent or bare. Thorax with bristles; hypopleural bristles present, rarely weak, postscutellum well developed. Legs variable, bearing bristles; pulvilli always present on at least the posterior four legs, often elongate. Wings variable in shape, sometimes pictured; all the veins simple; apical crossvein usually present, formed
by the curvature of the fourth longitudinal vein, this vein rarely straight or almost so, sometimes obsolete apically; posterior crossvein rarely absent; first, third and fifth veins sometimes bristled; basal and anal cells complete. Squamae almost invariably large. Abdomen variable in shape, usually bearing conspicuous bristles on the sides, apex and disc, but these variable; genitalia variable in both sexes.

The Tachinids are, insofar as known, all parasitic on other insects, particularly Lepidopterous, Tenthredinid, and beetle larvae and adult beetles, as well as Hemiptera, Orthoptera and possibly some other orders of insects. One or two species are known to be parasitic on other flies (Syrphidae). The species parasitic on Hemiptera usually have a bristleless, or near bristleless abdomen while many of those parasitizing beetles have a long, piercing ovipositor, but this character is not limited to such species. The eggs are variable, some being very small (microtype), while others are large (macrotype). A small number of species deposit living larvae or eggs just ready to hatch. The study of the immature stages of the Tachinids should prove to be a most fascinating one as is indicated by such work as has already been done. The species of Gonia, which lay microtype eggs, scatter hundreds of them (as many as a thousand) over vegetation and the ground; they are eaten by feeding caterpillars and ultimately destroy their host. This may seem a haphazard way of doing things but the flies are efficient parasites as
FAMILY TACHINIDE—THE TACHINIDS

evidenced by their numbers. In at least one species the larvae, resembling little coiled cones, remain for long periods on leaves, until they are brushed by the hair of a caterpillar, when they suddenly become active, make their way up the hair and enter the body. Most species, however, apparently oviposit in or on the host and in the case of many caterpillars the egg shells remain attached to the larva for long periods, and may be found on them as long as the larval skin exists. This is commonly the case with silk worm caterpillars parasitized by species of Achactoecusa, but the characteristic is not restricted to this genus. The literature on this subject is more extensive than one might imagine although I must confess that I am not familiar with it in its entirety.

The study of the immature stages has been greatly stimulated because of the economic importance of these insects. A goodly number of species have been imported to America in connection with the natural control of foreign pests which have become established here and the study of the group has resulted. The best known of the imported Tachinids is Combslura concinnata Bouché, which is now well established in the northeastern states and parts of eastern Canada, and is spreading rapidly. This species is one of the chief parasites of the Gypsy Moth but it apparently attacks almost any kind of caterpillar. Microphthala michigacensis Townsend, has been established in New Zealand from shipments made by the Canadian government. Some of the species imported have occurred in this country for many years and are perhaps indigenous but it is not by any means certain that the native flies will attack the alien hosts. This point is mentioned merely to illustrate the fact that the same species may have different habits in different regions. It also demonstrates our lack of knowledge concerning these insects. Parasites are searched for in all parts of the world, but most of those we have introduced are from Europe and Asia. Just how many of these introductions have resulted in the definite establishment of species in this country we do not know, but there are some failures as well as notable successes. Immediate results in control must not be expected, but it seems likely that in due time a natural control of the pests will occur. To expect the Tachinids, or other parasites, to control the pests they are brought to fight within a few years is just as absurd as to have expected the Pilgrim Fathers to have completely settled this country in ten years.

Tachinids occur everywhere and many species are common. Clearings or lanes in woods are excellent for some species; most of them visit flowers at some time or other, and many are found in grass. A few species are nocturnal, others fly at dusk or on dark days and a number
of them are attracted to light. "Honey dew" is very attractive to many of the species. The adults are frequently very busy creatures and many females seem to fly incessantly in search of a suitable host for their offspring.

It is extremely unfortunate that this important family is in such a hopeless state taxonomically. The forms I include were at one time placed in two distinct families, the Tachinidae and Dexiidae, and some authors have recognized a number of families for the group. The Dexids were separated because of the plumose or haired arista but the character is not of value. During my studies of this family I have searched in vain for reliable characters by which to differentiate groups. Many characters are good up to a certain point but beyond that they cease to be of real value. In many genera the propleura is haired but in some this character is not reliable. The same is true in regard to the hairiness of the lower squamal lobe, a character occurring in but a few genera in the world. The chaetotaxy is variable and there is every gradation between extremes.

Complex antennae found in Tachinidae.

The question of generic limits in this family is a most perplexing one. No two people have the same conception of generic limits and it will be found that I disagree in many respects with Townsend, Villeneuve, Aldrich and others, although agreeing rather well with Dr. Aldrich. I have been unable to correlate all of Townsend's genera with my conception of genera but I have indicated, in the index, a great many which I think should be placed in the synonymy. It might be, of course, that I have gone too far in reducing the number of described genera and that some of those relegated to the synonymy should be recognized as distinct. I feel, however, that the number of genera recognized is still too large and that we may safely reduce it to the benefit of the taxonomy of the family. It is true that in the present work I have added a number of new names and my excuse for doing so is to be found in the fact that I am unable to place the species in any described
genus known to me. No one can correct the classification of this family without a very large collection from all parts of the world and a very extensive study will be necessary before any satisfactory generic limitation can be fixed. Indeed, the classification can never be settled because we are continually discovering new connecting links between genera and species. Some genera are well established and fairly well limited but the number is small.

It is unfortunate that Dr. C. H. T. Townsend has been unable (up to the present time) to find a publisher for his volumes on the classification of this family. No one has ever equalled Townsend in knowledge of the Tachinidae and his keys would prove to be of inestimable value and would throw light on the position of the hundreds of genera described in various places. At the present time one is absolutely lost unless specimens are available, and it is only by chance that an occasional specimen can be determined.

The student will find a number of changes in nomenclature incorporated in this work and I fear that this will cause some confusion. However, due to the work of Townsend and others we have now discovered older names for many of our species and genera and many misconceptions in identification have been corrected. It is suggested that, if a name occurs in literature and cannot be found in the key, it be looked for in the index. In this way most of the names will be found. Nevertheless, there will be confusion because most of the older authors had little conception of the position of the species described and many very different forms have been placed in the same genus. Things are not quite as hopeless as they may seem, but the beginner will find himself badly handicapped, at least until a catalogue is published.

A preliminary key has been prepared in order to obviate the necessity of going through the entire key and turning many pages before arriving at suitable couplet. Any figures on the right of the page of the abbreviated key refer to a couplet in the key proper and the search for the genus should be taken up from that point.

SYNOPTIC TABLE OF KEY GROUPS

A. Lower lobe of squamae bare above .................................................. B
   Lower lobe of squamae pilose above .............................................. 2

B. Middle of propleura bare .............................................................. C
   Middle of propleura with pile or hair ........................................... 4

C. Infrasquamal setulae absent; abdomen with bristles ....................... E
   Infrasquamal setulae present or the abdomen without dorsal bristles . D

D. Eyes haired .................................................................................. 55
   Eyes bare or almost so.................................................................... 84
E. Eyes bare or with inconspicuous short hair. ........................................... G
Eyes pilose ................................................................................................. F

F. Parafacials with hairs or bristles extending to the lower half. .............. 161
Parafacials bare at least on the lower half. ............................................ 181

G. Parafacials with hairs or bristles. .......................................................... 236
Parafacials bare at least the lower half. .................................................. H

H. Thorax without plumose hairs ............................................................... I
Thorax with plumose hairs. ........................................................................ Teleothryia

I. Facial ridges bristled on less than the lower half. ............................... 293
Facial ridges with strong bristles on lower half or more. ......................

J. Apical crossvein present ....................................................................... K
Apical crossvein absent ............................................................................ 342

K. Palpi present and well developed ......................................................... L
Palpi absent or very greatly reduced ..................................................... 348

L. Apical cell at most with an extremely short petiole. ......................... M
Apical cell long petiolate ........................................................................ 355

M. Ultimate section of fifth vein less than half as long as the preceding section ................................................................. 3
Ultimate section of fifth vein three-fourths as long as the preceding section ................................................................. Catalinovoria

N. Penultimate aristal segment not over twice as long as wide ............. 361
Penultimate aristal segment three times as long as wide .....................

O. No appendage or strong fold at bend of fourth vein ...................... 385
A strong appendage or fold at bend of fourth vein ............................. 372

KEY TO GENERA

1. Lower lobe of squamae bare or pubescent above ................................ 3
Lower lobe of squamae with long, fine hairs above ............................... 2

2. Parafacials haired to below the middle (113) . . . Bombyliopsis Townsend Parafacials with but a few hairs below the frontals (91).
Hystricia Macquart

3. Middle of propleura bare ................................................................... 53
Middle of propleura with pile or hair .................................................... 4

4. Eyes thickly hairy, the head almost as long below as at base of antennae ................................................................. 5
Eyes bare, or, if pilose, the face retreating and the facial ridges usually bristled on the lower half .................................................. 8

5. Parafacials bare ................................................................................... 6
Parafacials haired on lower half .......................................................... 7

6. Facial ridges bristled on lowest three-fourths; first vein setulose.
Hypochaeta Brauer & Bergenstamm
Facial ridges and first vein bare (100).
Pseudohystricia Brauer & Bergenstamm
7. Palpi well developed..................Arthrochæta Brauer & Bergenstamm
   Palpi absent or extremely small; large, robust species.
   Tachinomima Brauer & Bergenstamm

8. Thorax without plumose hair.......................... 9
   Thorax, at least on the pleura, clothed with plumose hairs (Genotype:
   Ptilomyia bequaerti Curran).......................... Ptilomyioides, n. g.

9. Palpi present, strongly developed, at least as long as the second an-
   tennal segment ...................................... 19
   Palpi absent or very small........................... 10

10. Arista plumose ...................................... 11
    Arista bare or pubescent................................ 13

11. Posterior tibiae rather closely ciliate............... Opsotheresia Townsend
    Posterior tibiae not ciliate............................ 12

12. Palpi absent ........................................ *Atelogossa Coquillett
    Palpi slender and short.............................. Phasiops Coquillett

13. Parafacials with hairs or bristles.................... 14
    Parafacials bare; ocellars strong (51).............†Cylindromyia Meigen

14. Ocellars strong .................................. 15
    Ocellars weak or absent; parafacials without bristles........... 18

15. Parafacials with strong bristles below; apical cell petiolate.
    Antillicolla Curran
    Parafacials with hair.................................. 16

16. Apical cell ending very close to wing-tip; head short.
    Phosocephala Townsend
    Apical cell ending far before the wing-tip; head long............. 17

17. Abdomen with ordinary bristles below, rounded apically.
    Gymnomma Brauer & Bergenstamm
    Abdomen with spines ventrally, emarginate apically. Juriniopsis Townsend

18. With ordinary bristles on the abdomen............... Epalpus Rondani
    With blunt spinose bristles on the dorsum of the abdomen.
    Rhachoépalpus Townsend

19. Parafacials hairy or bristly to well below the middle.......... 20
    Parafacials with at most a few hairs below the lowest frontals..... 33

20. Parafacials with ordinary hairs........................ 22
    Parafacials with bristles................................ 21

21. Apical cell open (73, 74).......................... Goniochaeta Townsend
    Apical cell petiolate................................. Eutrichogena Townsend

22. Ocellar bristles strongly developed.................... 27
    Ocellar bristles extremely weak or absent..................... 23

23. Palpi but little longer than the length of the oral opening, enlarged
    apically ............................................. 25
    Palpi very much longer than the length of the oral opening, with par-
    allel sides or somewhat narrowed apically.................. 24

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24. Acrostical bristles absent.......................... Eudejeania Townsend
   Acrostical bristles present (17).............. Dejeania Brauer & Bergenstamm

25. Abdomen convex, the apex rounded.......................... 26
   Abdomen very large, unusually flat above, sub-rectangular, the apex strongly emarginate (60)............ Paraedejeania Brauer & Bergenstamm

26. Second abdominal segment with at most four median marginals, if
   with discs they are arranged in pairs (11, 102).* Archytas Jaennicke
   Second abdominal segment with many marginals, numerous discs or
   the pile very long and bristly (95)..................... Jurinia Desvoidy

27. Ultimate section of fifth vein two-thirds as long as preceding section.
   Metaplagia Coquillett
   Ultimate section of fifth vein not one-third as long as preceding section ........................................ 28

28. Abdomen without discs, or they are fine and hair-like.................. 29
   Second and third abdominal segments with strong discs.
   Protodejeania Townsend

29. Face not carinate on lower half of depression.......................... 31
   Face carinate on whole length of depression.............................. 30

30. Hair of parafacials inconspicuous........ Myiomima Brauer & Bergenstamm
   Hair of parafacials strong.......................... Ursophyto Aldrich

31. Arista plumose .................................. Phalacroderexia Townsend
   Arista bare or pubescent.................................. 32

32. Posterior sublateral bristle present.
   † Cnephaliodes Brauer & Bergenstamm
   Posterior sublateral bristle absent; proboscis long, the labellae small.
   Phytopsis Townsend

33. Frontal bristles not or scarcely extending below the base of the an- 
   tennae; arista strongly pubescent or plumose.................. 38
   Frontal bristles usually extending to the base of the third antennal 
   segment; arista not conspicuously pubescent.......................... 34

34. Ocellars present .................................. 35
   Ocellars absent...........................................‡Belvosia Desvoidy

35. Facial ridges with strong bristles on at least the lower half........... 37
   Facial ridges with only a few hairs above the vibrissae.......... 36

36. Eyes pilose (Zenilia submissa A. & W.).......................... Collatia, n. g.
   Eyes bare .............................................. Parademoticus Townsend

37. Infraquadmal setulae present.......................... Hypochaetopsis Townsend
   Infraquadmal setulae absent.................................. Chaetophlepsis Townsend

38. Arista with long rays.................................. 39
   Arista with long rays....................................§Arctophyto Townsend

39. Infraquadmal setulae absent.......................... 40
   Infraquadmal setulae present (Metopidae).................. Opsodexia Townsend

† Rowe, 1931, Ann. Ent. Soc. Amer., xxiv, p. 647 (Fabriciella).
‡ Aldrich, 1926, Pr. U. S. N. M., lxiii, Art. 8, pp. 1-45.
Tachinidae II.—18, 19, Acaulona costata; 20, Alopehora fumosa; 21, 22, Alopehora; 23, 24, Ceratomyiella; 25, Euscopia dakotensis; 26, 27, Oestraphasia calva; 28, 29, Euryceromyia robertsoni, bristles omitted from third vein of wing; 30, 31, Neophyto setosa (Metopiidae); 32, 33, Rhinophora mexicana; 34, Cryptomeigenia; 35, Myiophasia; 36, Binghamimyia; 37, 38, Hemyda aurata; 39, Cuphocera; 40, 41, Wagneria, bristles omitted from veins.
40. Second abdominal segment with dorsal bristles........................................ 46
    Second abdominal segment without dorsal bristles.................................. 41

41. Sides of face diverging below; cheeks wider than length of third antennal segment ........................................... 42
    Sides of face slightly converging below; cheeks about as wide as width of third antennal segment .................. Xanthodexia Wulp

42. Face strongly carinate.......................................................... 44
    Face at most weakly carinate.......................................................... 43

43. Probosces decidedly longer than the head-height. . . . Prosenoides Townsend
    Probosces shorter than the head-height (118, 122)...... Billaca Desvoidy

44. Antennæ not nearly reaching the vibrissae.................................. 45
    Antennæ reaching almost to the vibrissae........... Theresiopsis Townsend

45. Facial carina not convex in profile........................................ 48
    Facial carina convex in profile......................... Opsotheresia Townsend

46. Facial carina strong and prominent........................................ 51
    Facial carina weak, obsolete or nearly so........ 47

47. Apical cell ending in or near the wing-tip.
    Stomatodexia Brauer & Bergenstamm
    Apical cell ending far before the wing-tip.............. 48

48. Antennæ reaching about half way to the oral margin.
    Phalacrophyto Townsend
    Antennæ reaching more than half way to the oral margin.......... 49

49. Abdomen broadly oval; larger, more or less castaneous species.
    Theresia Desvoidy
    Abdomen narrower; smaller, non-castaneous.................. 50

50. Second abdominal segment without strong marginals.
    Paratheresia Townsend
    Second abdominal segment with a pair of strong marginals.
    *Eutheresia Townsend

51. Second abdominal segment with only one pair of marginals, or they
    are not spine-like .................................................. 52
    Second abdominal segment with three or more pairs of marginal
    spines; large, robust species........... Chaetogyne Brauer & Bergenstamm

52. Claws short and thick basally, bent at almost a right angle at their
    middle; parafacials with inconspicuous hairs.
    Myiomima Brauer & Bergenstamm
    Claws normal, moderately curved apically (118, 122)... Billaca Desvoidy

53. Infrasquamal setulae absent, abdomen always with bristles, at least
    on the apical segments ........................................... 159
    Infrasquamal setulae present or the abdomen without well-developed
    bristles .......................................................... 54

54. Eyes thickly haired .............................................. 55
    Eyes bare or with inconspicuous, short, sparse hair........ 84

55. Parafacials with hairs or bristles on at least the upper half ........ 56
    Parafacials bare or with only a few hairs below the frontals......... 65

FAMILY TACHINID.E—THE TACHINIDS

56. Ultimate section of fifth vein not over one-third as long as the preceding section, or the parafacials without bristles. 58
   Ultimate section of fifth vein at least half as long as the preceding section; parafacials with one or more procline bristles. 57

57. Inner end of posterior crossvein lying immediately behind the anterior crossvein. Plagia Meigen
   Discal crossvein lying well beyond the anterior crossvein. Cyrtophleba Rondani

58. Fourth vein angulate or with sharp curve; abdomen with strong bristles. 59
   Fourth vein approaching the third in a gentle curve; abdomen with only weak bristles apically. Gymnophania Brauer & Bergenstamm

59. Parafacials without bristles along their inner edges, sometimes with bristly hairs along their middle. 61
   Parafacials with a row of bristles along their inner edges. 60

60. Basal two aristal segments short; antennae simple in both sexes. 60a
   Basal aristal segments very elongate; third antennal segment of male composed of two or three arms (103, 104). Dihocera Williston

60a. Third antennal segment but little longer than the second. Muscopteryx Townsend
   Third antennal segment several times as long as the second (42, 43, 45, 52, 96). Paradidyma Brauer & Bergenstamm

61. Parafacials without strikingly long hair, or it is irregularly spaced. 62
   Parafacials with the hairs arranged in a median series and increasingly long and strong below. *Eulasiona Townsend

62. Bend of fourth vein with at most a distinct fold. 63
   Bend of fourth vein with a long appendage. Metopomuscopteryx Townsend

63. Three pairs of presutural acrostical bristles or three presutural dorso-centrals. Lydina Desvoidy
   At most two pairs of presutural acrostical bristles. 64

64. Two pairs of presutural acrosticals and dorso-centrals (35, 139). Myiophasia Brauer & Bergenstamm
   A single pair of presutural acrosticals and two pairs of dorso-centrals. Townsendina, n. g.

65. Facial ridges without strong bristles. 69
   Facial ridges with strong bristles on lower half or more. 66

66. Parafacials not wider than antennae. 67
   Parafacials much wider than antennae; oral margin scarcely produced. Myiopharus Brauer & Bergenstamm

67. Arista long plumose. Comyops Wulp
   Arista at most very short plumose. 68

68. Ocellars strong; face not strongly retreating below; female piercer as long as the abdomen. Spathimyia Townsend
   Ocellars absent or hairlike; face strongly retreating. Paralispe Brauer & Bergenstamm

Tachinidae IV.—69, Plagionima anomala; 70, Beskia cornuta; 71, Xanthomelana arcuata; 72, Pachyophthalmus floridensis (Metopiidae); 73, 74, Goniocera plagioides; 75, Pachyophthalmus floridensis (Metopiidae); 76, Xanthomelana arcuata; 77, Linnaeomya; 78, Siphonia; 79, Plagionima anomala; 80, 81, Euthera tentatrix; 82, Epigrimyia; 83, Chetoplagia; 84, 85, Euthyprosopa petiolata; 86, Chetoplagia; 87, Chetogedia analis; 88, Metopia (Metopiidae); 89, Melanophrys insolita; 90, Opsidia gonioides (Metopiidae); 91, Hystricia; 92, Chryseria flavu.
69. Not metallic green or blue.................................................. 70
   Metallic green or blue...........................................Chrysotachina Brauer & Bergenstamm

70. Parafrontals pollinose, at most bare at the vertex.............. 71
   Parafrontals shining black................................. Polidaria n. g.

71. Oral margin not strongly oblique in front nor carried strongly upward toward the base of the antennae; antennae situated at or above the middle of the eyes; oral margin produced or not............. 72
   Oral margin and antennal base unusually approximated, the oral margin strongly oblique in front; antennae situated below the middle of the eyes; parafacials always with many hairs below the frontals.

Lydina Desvoidy

72. Ocellar bristles strong.................................................. 75
    Ocellars absent or very weak.................................. 73

73. Antennae inserted at upper fourth of eyes; bend of fourth vein with stump (141, 167)..............................................Xanthophyto Townsend
    Antennae inserted at middle of eyes; bend of fourth vein without stump ........................................... 74

74. Arista plumose (188, 195).............................................. Zonalia, n. g.
    Arista short pubescent or bare (146, 161, 166, 187)...........Corozalia, n. g.

75. Head almost as long below as at the antennae, the oral margin produced; vibrissae usually situated above oral margin. 77
    Face retracting below; vibrissae level with oral margin. 76

76. Fifth vein bristled.................................................. Minthoplagia Townsend
    Fifth vein bare.................................................... 78

77. Palpi of normal length, more or less swollen apically; fourth vein with long appendage at bend (77)........... Linnaemya Desvoidy
    Palpi not more than half the usual length, never widened apically; third antennal segment rounded apically (142)................. Neoerigone Townsend

78. Pteropleural bristle extending to the apex of the squamae. 81
    Pteropleural bristle normal.................................... 79

79. Face about as long below as at the antennae. 80
    Face strongly receding........................................... Thelairodoria Townsend

80. Abdomen long and slender........................................ Oxydexia Bigot
    Abdomen short, robust........................................... Mericia Desvoidy

81. Posterior pair of presutural acrosticals situated very close to the suture. 82
    Posterior pair of presutural acrosticals situated far before the suture; female ocellars reclinate; male with outer verticals.

Trafoia Brauer & Bergenstamm

82. Pleura with fine, pale pile below; third antennal segment rounded apically ........................................ Neoerigone Townsend
    Pleura wholly black haired.................................... 83

83. Front tarsi of female broadened; third antennal segment rectangular at upper apex (112) (Exoristoides Coquillett, Exoristopsis Townsend)................................. *Eversmannia Desvoidy
    Third antennal segment rounded at upper apex........... Mericina Curran

* The genera Neoerigone, Eversmannia and Mericina are so poorly distinguished that I think they should be united. For key to species see Aldrich, Proc. U. S. N. M., Ixxxi, Art. 9, p. 24 (Exoristoides).
Tachinidae V.—93, Fischeria flava; 94, Zenillia; 95, Jurinia; 96, Paradidyma singularis; 97, 98, Stomatomya parvipalpis; 99, Microphthalmia disjuncta; 100, Pseudohystricia; 101, Microtrichoma; 102, Archyta californica; 103, Dichocera lyrata; 104, Dichocera lyrata, antenna; 105, Muscopteryx; 106, Hilarella (Metopidae); 107, Neotactocera; 108, Viviania; 109, Achionera; 110, Senotainia (Metopidae); 111, Gediopsis; 112, Genea analis; 113, Bombyliopsis; 114, Chaetoglossa, proboscis omitted.
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84. Arista pubescent or bare .................................................. 100
     Arista at least short plumose on basal half ................. 85
85. Oral margin distinctly produced ........................................ 96
     Oral margin scarcely prominent, the face almost vertical .... 86
86. Width of clypeus much greater than width of third antennal segment. 87
     Width of clypeus not greater than width of third antennal segment.

Macrometopa Brauer & Bergenstamm

87. Parafacials with hair .................................................. 92
     Parafacials bare .................................................. 88
88. Ocellars long and strong .............................................. 91
     Ocellars hairlike .................................................. 89
89. First vein bare .......................................................... 90
     First vein bristled .................................. Gymnopalpus Townsend
90. Arista short plumose on whole length; no discals on intermediate segments; first segment without marginals .... Pseudochetota Townsend
     Arista short plumose on basal half only; abdomen with discals, the first segment with marginals (186, 190). .......... Chatonalia, n. g.
91. Aristal rays as long as the width of the third antennal segment. Ebenia Macquart
     Aristal rays about half as long as the width of the third antennal segment (169, 191). .................. Canalia, n. g.
92. Antennæ reaching more than half way to the oral margin ......... 93
     Antennæ reaching only half way to oral margin; prosternum with a pair of bristles ........ Myoceropsis Townsend
93. Hair of parafacials coarse .......................................... 94
     Hair of parafacials very fine; first vein bare (121, 134). Cholomyia Bigot
94. Apical cell ending near the wing-tip .................................. 95
     Apical cell ending far before the wing-tip ............. Microcheta Wulp
95. First vein setose (154, 180) ........................................... 97
     First vein bare ........................................ Parazelia Townsend
96. Proboscis, measured from base of apical section, at most slightly longer than length of oral opening .................................................. 97
     Proboscis twice as long as length of oral opening.

Mochlosoma Brauer & Bergenstamm

97. Apical cell closed and short petiolate .................................. 98
     Apical cell broadly open (Clinoneura, B.B.; Paramyoere Towns.) (119, 124, 125, 133) .................. Rhynchiodexia Bigot
98. Third vein setose less than half way to the anterior crossvein .... 99
     Third vein setose to the anterior crossvein ............. Megerlea Desvoidy
99. Bend of fourth vein with long appendage ............... Hypenomyia Townsend
     Bend of fourth vein with at most a very short appendage.

Dinera Desvoidy

100. Face without a very prominent carina appearing above the antennae in profile .................................................. 101

Tachinidae VI.—115, Melanophora; 116, Sophia; 117, Calodexia; 118, Billea; 119, Rhynchiodexia; 120, Scotiptera; 121, Cholomyia; 122, Billea; 123, Thelaira; 124, 125, Rhynchiodexia; 126, Calodexia; 127, Hystrichodexia; 128, Zelia; 129, Scotiptera melaleuca; 130, Hystrichodexia; 131, Zelia; 132, Chaetona; 133, Rhynchiodexia; 134, Cholomyia, legs.
Face short, with a strong facial carina, the antennal grooves deep; proboscis one-half longer than the head-height; abdomen without bristles, the apical segments with longish hairs; female genitalia with stout spines on the sides. ........... Imitomyia Townsend

101. Second abdominal segment with at least well developed median marginals ........................................... 123
102. Posterior tibiae without flattened bristles................................................................. 103
103. Facial depression shallow or somewhat carinate, if deep not sub-oval in outline; arista, if wholly thickened, reddish in color.......................... 104
104. Arista not wholly thickened; parafacials without transverse furrows ........................... 105
105. Fourth vein strongly curved beyond the crossvein...................................................... 106
106. Face not or but little retreating, the vibrissae situated well above the oral margin .................................................. 109
107. Apical cell petiolate........................................................................................................ 108
108. Apical cell ending well before the wing-tip......................................................... Pseudapinops Coquillett
109. Oral vibrissae, if strongly differentiated, situated almost level with the oral margin; abdomen short, oval, spherical or flattened, rarely elongate .................................................. 110
110. Abdomen short, or if elongate not flattened .......................................................... 111
111. Sternites broad, the female genitalia not remarkably large; oral vibrissae usually strongly differentiated, their angle high above the oral margin; abdomen short, rather spherical in outline, strongly convex or flattened .................................................. 113
112. Sternites linear, thread-like; second sternite large, produced downward and with very short, stout setulae on the lower part; female genitalia very large; vibrissae distinct, situated but little above the oral margin; palpi minute........................................... 112

112. Apical cell long petiolate or the apical crossvein absent.  
   **Besseria** Desvoidy  
   Apical cell open near the wing-tip.  
   **Apinops** Coquillett  

113. Oral vibrissae situated high above the oral margin or not strongly  
   differentiated; if the abdomen bears bristles the apical cell is open.  
   Oral vibrissae strongly developed, level with the strongly produced  
   oral margin ............................................. 114

114. Apical cell long petiolate (55) .................................. 115  
   **Catharosia** Rondani  
   Apical cell open or closed in or near the wing-tip  

115. Parafacials bare on lower half ....................................... 116  
   Parafacials with bristly hairs ..................  
   **Chiricahuia** Townsend  

116. Abdomen with bristles ........................................... 117  
   Abdomen with weak, bristly hairs apically; apical crossvein absent.  
   **Bezzimyia** Townsend  

117. Anterior femora with only the usual fine or bristly hairs beneath.  
   Anterior femora on the apical half of the ventral edges with row  
   of short stout, bristly setulae .................................. 118  
   **Gymnosoma** Meigen  

118. Abdomen flattened or twice as long as wide  
   Abdomen strongly convex, hemispherical (10). .... 119  
   **Cistogaster** Latreille  

119. Apical cell broadly open or closed in the costa near the wing-tip  
   Apical cell long petiolate .................................... 120  

120. Abdomen without bristles ........................................ 121  
   Abdomen with well developed bristles on the apical segments.  
   **Trichoclytia** Townsend  

121. A row of dorsocentrales, one situated in front of the suture (92).  
   **Chryseria** Desvoidy  
   At most two pairs of conspicuous dorsocentrales  
   **Phasia** Latreille  

122. Pleura with very dense pale hairs above (15, 20, 21, 22).  
   Pleura with ordinary black hairs and bristles  
   **Alophora** Desvoidy  
   **Hyalomya** Desvoidy  

123. Parafacials with one or more downwardly directed bristles below the  
   frontal row or with hairs extending to or below the middle  
   Parafacials with at most a few hairs below the lowest frontals  
   Without strong parafacial bristles, the hairs sometimes stout but  
   always weaker than the lower frontals ..................................... 124  
   125  

124. With one or more downwardly directed parafacial bristles ........... 125  
   With strong parafacial bristles, the hairs sometimes stout but  
   always weaker than the lower frontals  

125. Apical cell open; apical section of fifth vein over half as long as the  
   preceding section ............................................ 126  
   **Hesperophasia** Townsend  

126. Parafacials with several downwardly directed bristles ............. 127  
   Parafacials with a single downwardly directed bristle (8).  
   **Voria** Desvoidy  

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Tachinidae VIII.—148, Actia; 149, Elodia; 150, Epigrimyia; 151, Thelairalia; 152, Pelcotheca; 153, Doryphorophaga; 154, Schwarzalia; 155, Ricosia; 156, Compsilura; 157, Thelairalia; 158, Patillalia; 159, Anacanthomyia americana; 160, Agraria; 161, Corozalia; 162, Winthemia; 163, Trichiodopa.
127. Pteropleural bristle normal.................................128
      Pteropleural bristle reaching to the apex of the squama.
                      Meleterus Aldrich

128. Face retreating below......................................129
      Face as long below as at the antennæ..................Chaetovoria Villeneuve

129. Oral vibrissae situated level with the oral margin; posterior crossvein
      situated near the middle of the wing....................130
      Oral vibrissae either situated well above the oral margin or the pos-
      terior crossvein near the apical third of the wing........133

130. Cheeks very much narrower than the eye-height..............131
      Cheeks almost or quite as wide as the eye-height.....*Uclesia Girschner

131. Facial depression broad and shallow, the edges rather flattened......132
      Facial depression deep and narrow, the edges prominent.
                      Menetus Aldrich

132. Parafacials rather narrow, with small hairs over a considerable part
      of the surface ..................................Metavoria Townsend
      Parafacials wide ..................................Metaplagia Coquillett

133. Apical cell at most extremely short petiolate..................134
      Apical cell long petiolate............................137

134. Face strongly receding below; third antennal segment about three
      times as long as the second; three pairs of strong scutellars, the
      apical pair widely spaced and divergent..................136
      Face usually but little receding; third antennal segment less than twice
      as long as the second................................135

135. Costal spine short; facial depression rather narrow (35, 139).
                      Myiophasia Townsend
      Costal spine long and strong; facial depression wide......Lasionalia, n. g.

136. First vein setulose on apical half.......................137
      First vein bare (34)..............†Cryptomeigenia Brauer & Bergenstamm

137. Third vein ending near the wing-tip (32, 33)...........Rhinophora Desvoidy
      Third vein ending far before the wing-tip..............Steveniopsis Townsend

138. Frontal vitta opaque......................................139
      Frontal vitta shining black (37, 38)..................Hemyda Desvoidy

139. Posterior tibiae without scale-like bristles..............140
      Posterior tibiae ciliate above with scale-like bristles (102, 139).
                      Trichiopoda Latreille

140. Anterior femora with a row of long bristles on at least the apical
      half of the posteroventral surface, appearing as widely spaced cilia.141
      Anterior femora with at most two or three posteroventral bristles
      apically; the hairs on the posterior surface wholly appressed (18,
      19) .............................................Acaulona Wulp

141. Apical cell open, or if closed in the wing margin there are hairs about
      the base of the vibrissae...............................142
      Apical cell closed and petiolate........................142

† Curran, 1926, Tr. Roy. Soc. Canada, Sec. v, p. 156.
Tachinidae IX.—164, Trichiopoda; 165, Patillalia; 166, Corozalia panamensis; 167, Xanthophyto; 168, Aridalia; 169, Canalia; 170, Oxynopsalia; 171, Anadiscalia; 172, Prorhynchops? errans; 173, Elodia; 174, Epigrimyia; 175, Doryphorophaga; 176, Shermanalia; 177, Zuanalia; 178, Pseudeuantha.
142. No hairs surrounding the oral vibrissæ which are situated high above the oral margin; abdomen long and slender (71, 76).

**Xanthomelana Wulp**

Vibrissæ situated level with the oral margin, or if somewhat above with a few hairs near their base; abdomen, from dorsal view, spherical in outline...*Clistomorpha Townsend

143. Oral vibrissæ differentiated; oral margin not rounded anteriorly in profile ................................................................. 144

Oral vibrissæ not differentiated, or only very weakly so; head convex below in profile; clypeal region narrow and at least two-thirds as long as upper part of face. ................. Eutrixa Coquillett

144. Costal spine not greatly developed, never longer than the width of the costal cell and not conspicuous. 145

Costal spine as long as width of costal and subcostal cells combined; vibrissæ level with oral margin; parafacials gently convex in profile. Phrynofrontina Townsend

145. Face strongly retreating, vibrissæ level with oral margin or situated moderately above; three or four pairs of marginal scutellars and sometimes a weak apical pair which may be cruciate; arista rarely thickened to beyond the middle, the penultimate segment never elongate ................................................................. 153

Face almost as long below as at base of antennæ; arista often thickened to the apical fourth and with the penultimate segment elongate ................................................................. 146

146. Arista not thickened on its whole length; facial depression not oval and deeply sunken ...................................................... 147

Arista thickened on its whole length; facial depression oval and very deep (89) ........................................... Melanophrys Williston

147. Parafacials more or less yellowish in ground color; abdomen usually largely yellow and extensively pollinose 148

Parafacials silvery pollinose on a black ground; abdomen shining black, the sides sometimes broadly red; vibrissæ level with oral margin ........................................... Dionaea Desvoidy

148. Cheeks more than one-tenth as wide as the eye-height; female abdomen not truncate at apex from lateral view .......................... 149

Cheeks at most one-fifteenth as wide as the eye-height; arista short plumose; ocellars absent or very weak (117) ............ Calodexia Wulp

149. Vibrissal angles not approximated, or if so the vibrissæ situated level with the oral margin ............................................ 150

Vibrissal angles conspicuously approximated, the vibrissæ situated above the oral margin (92) .......................... Chryseria Desvoidy

150. Anterior crossvein situated half way between the tip of the auxiliary and first veins; posterior crossvein but little oblique .................. 151

Anterior crossvein situated behind the tip of the first vein; posterior crossvein very oblique .......................... Catalinovoria Townsend

151. Vibrissæ situated distinctly above the oral margin; oral margin not prominent (108) ........................................... Viviania Rondani

Vibrissæ level with oral margin ........................................... 152

Tachinidæ X.—179, Agrarialia; 180, Schwarzalia; 181, Microtownsendia; 182, Anadiscalia; 183, Siphona; 184, Pseudeuantha; 185, Shermanalia; 186, Chaetonalia; 187, Corozalia; 188, Zonalia; 189, Actia; 190, Chetonalia; 191, Canalia; 192, Blondelia; 193, Microtownsendia; 194, Oxynopsalia; 195, Zonalia.
152. Proboscis very long and slender; ovipositor normal. Ginglimyia Townsend
Proboscis short, the labellae fleshy; ovipositor as long as abdomen. Xiphomyia Townsend

153. Ocellars distinct .......................................................... 155
Ocellars absent; three sternopleurals .................................... 154

154. Abdomen broad, oval as in Sturnia ................................. Prorogluta Townsend
Abdomen rather narrow, tapering .......................... Lixinia Curran

155. Vibrissae situated above the oral margin, the oral margin not prominent (108) .......................... Viviania Rondani
Vibrissae practically level with the oral margin, the oral margin slightly produced .......................... 156

156. Two or three pairs of presutural acrosticals, the middle pair always strong ......................................................... 157
One or two pairs of weak presutural acrosticals. Ochromaegenia Townsend

157. First vein bare .............................................................. 158
First vein setulose ............................................................ Theialirochetaena Townsend

158. Anterior tibiae with a single posterior bristle.................. Erycioides Curran
Anterior tibiae with two posterior bristles (Lydella auct.) (135, 192).

*Blondelia Desvoidy

159. Eyes with long or dense hair ........................................... 160
Eyes bare or with inconspicuous, short sparse hair .................. 235

160. Parafacials with hairs or bristles extending to the lower half .......................... 161
Parafacials with at most a few hairs below the frontals .................... 181

161. Palpi normal in length, usually thickened apically .................. 162
Palpi greatly reduced, slender, never much more than twice the length of the thickness of proboscis at point of attachment; bend of fourth vein with long appendage (77) .......................... Linnaemya Desvoidy

162. Frontal bristles not extending below the upper third of the face, normally only one situated below the base of the third antennal segment, the parafacials with other hairs or bristles at least above ......................................................... 163
Frontals extending to the middle of the third antennal segment; pteropleural reaching to the apex of the squamae. Lypha Desvoidy

163. Facial ridges not bristled on more than the lowest fourth or the ocellars procline ......................................................... 165
Facial ridges bristled on at least the lower half; ocellars absent or reclinate .......................................................... 164

164. Ocellars absent .............................................................. Tritaxys Macquart
Ocellars reclinate ............................................................. Distichona Wulp

165. Penultimate aristal segment rarely twice as long as wide, the preceding segment always short ................................................. 166
Basal two aristal segments greatly elongate ......................... Digonicheta Rondani

166. Abdomen with strong discals ........................................... 173
Abdomen without strong discals ........................................ 167

167. Apical cell long petiolate ................................................. 168
Apical cell open .............................................................. 169

168. Penultimate aristal segment elongate..............Paradmontia Coquillett
Penultimate aristal segment very short, the arista strongly thickened
at the base........................................Websteriana Walton
169. Posterior tibie evenly and closely ciliate with bristles; hair of parafacials fine ........................................170
Posterior tibie not ciliate or the parafacial hair coarse...............171
170. Facial ridges bristled on almost the lower half...Sturmiopsis Townsend
Facial ridges bristled on not more than the lowest third (145, 162).
* Winthemia Desvoidy
171. Parafacials with bristly hair or a row of bristles..............172
Parafacials with two bristles below..................Chromatocera Townsend
172. Ocellars proclinate (42, 43, 45, 52, 96).
Ocellars reclinate (155)..........................Ricosia Curran
173. Third antennal segment not more than twice as long as the second...178
Third antennal segment more than twice as long as the second........174
174. Apical cell long petiolate.................................................175
Apical cell not long petiolate.............................................176
175. First vein setulose on basal half.........................Paradmontia Coquillett
First vein bare..............................................Mauromyia Townsend
176. Penultimate aristal segment short.........................177
Penultimate aristal segment elongate; parafacials with two bristles
below ..................................................Chromatocera Townsend
177. Two presutural acrosticals............................Ictericophyto Townsend
Three presutural acrosticals (111)......Gaediopsis Brauer & Bergenstamm
178. Second antennal segment, if elongate, clothed with sparse, fine bristly
hairs on the upper surface..............................179
Second antennal segment as long as the third, very densely bristled
above; cheeks one-third as wide as the eye-height (105).
Muscopteryx Townsend
179. Vibrissae situated on a level with the oral margin..............180
Vibrissae situated well above the oral margin; parafacials almost as
wide as the third antennal segment.........................Meriana Desvoidy
180. Ocellars absent; prosternum bare..Bombyliomyia Brauer & Bergenstamm
Ocellars long, though weak, prosternum pilose.............Tachinalia, n. g.
181. Palpi of normal length and shape, if apparently short, broadened
apically ..............................................................182
Palpi short and narrow, seldom twice as long as thickness of proboscis
at point of attachment; bend of fourth vein with appendage (77).
Linnaemya Desvoidy
182. Facial ridges with strong bristles on lower half or more........183
Facial ridges with bristly hairs decreasing in length upwardly, rarely
extending almost half way........................................204
183. Ocellars long, readily distinguished................................190
Ocellars absent or hair-like........................................184

184. Three sternopleurals; face strongly receding, gently convex in profile; abdomen with discals. ................................................. 186
Sternopleurals 1-1; face receding, not convex. ......................... 185

185. Front slightly longer than the face, the antennae arising near the middle of the eyes in profile (138, 152) ............... Pelecotheca Townsend
Front much shorter than the face, the antennae arising near the upper fourth of the eyes in profile (140, 156) ....................... Compsilura Bouché

186. Face strongly receding; basicosta black. .......................... 187
Face gently receding; basicosta yellow (159) ....................... Anacamptomyia Bischoff

187. With only two pairs of orbitals in both sexes or the frontal vitta half as wide as either parafrontal. ......................... 188
With a row of orbitals in both sexes; frontal vitta narrow.

Metopiops Townsend

188. Fourth abdominal segment with discals. .......................... 189
Fourth abdominal segment without discals. ........................ Phanopsis Townsend

189. Frontal vitta two-thirds as wide as either parafrontal.

Paralispe Brauer & Bergenstamm

Frontal vitta not half as wide as either parafrontal.

*Argyrophi Iax Brauer & Bergenstamm

190. Pteropleural bristle not nearly reaching the apex of the lower squamal lobe ......................................................... 191
Pteropleural bristle extending to the apex of the lower squamal lobe; posterior sublateral bristle absent. ....................... Lypha Desvoidy

191. Penultimate segment of arista not over twice as long as wide. .. 193
Penultimate segment of arista at least three times as long as wide... 192

192. Front with a row of bristles outside of the frontals. Madremyia Townsend
Front without a row of bristles outside the frontals.

Murdockiana Townsend

193. Third antennal segment never with more than three branches. ... 194
Third antennal segment with a large number of branches on either side ................................................. Cryptocladocera Bezzi

194. Head decidedly more than half as long as high; parafacials wide or the face much wider than either eye, always wider than the front. .. 195
Head half as long as high; parafacials less than half as wide as the elongate third antennal segment; face but little wider than the front, scarcely retreating, its sides parallel on the lower three-fourths (159) ....................... Anacamptomyia Bischoff

195. Frontal bristles not extending below the base of the arista. ....... 196
Frontal bristles extending to the middle of the third antennal segment ................................................. Thrycolyga Rondani

196. Two or more bristles below the base of the antennae ............ 197
A single bristle below the base of the antennae .................. Cyzenis Desvoidy

197. Abdomen of ordinary form, decidedly wider than deep, the genitalia usually exposed, at least not enclosed in a slit-like opening. ... 198

* Curran, 1929, Suppl. to Gowdey’s Catalogue Dipt. Jamaica, p. 28.
Abdomen in both sexes wide and deep, the terminal segment large, normally concealing the genitalia within a slit-like opening.

*Pateloa Townsend

Middle coxae of female with normal bristles; males without orbitals. 199
Middle coxae of female with closely placed, curved apical spines; males with two pairs of orbitals (136, 137, 153, 175).

Doryphorophaga Townsend

Posterior sublateral bristle present ......................................................... 200
Posterior sublateral absent .........................................................↑Phorocera Desvoidy

Abdomen with discals ......................................................... 201
Abdomen without discals ......................................................... Euthelaira Townsend

Ocellars long and strong ......................................................... 202
Ocellars weak; posterior presutural acrostical absent.

Eupelecotheca Townsend

Ocellars procline ......................................................... 203
Ocellars reclinate ......................................................... Coloradalia, n. g.

Anterior tibiae with two posterior bristles; apical cell ending far before the wing-tip (Amphichaeta B. B.) ..............................................↑Phorocera Desvoidy

Anterior tibiae with a single posterior bristle; apical cell ending close to the wing-tip (170, 191) ......................................................... Oxynopsalia, n. g.

Not metallic green or blue ......................................................... 206
Metallic green or blue ......................................................... 205

Oral margin strongly produced ......................................................... Chlorotachina Townsend
Oral margin scarcely produced (56) ......................................................... Gymnochaeta Desvoidy

Pteropleural bristle of normal length or weak, if long the parafrontals are shining black or the frontal bristles do not extend below the base of the arista ......................................................... 209
Pteropleural very long and strong, extending to the apex of the squamae; frontals usually extending to the middle of the third antennal segment; parafrontals pollinose ......................................................... 207

Male without orbitals; parafacials almost or fully half as wide as third antennal segment ......................................................... 208
Male with orbitals; parafacials below not over one-fourth as wide as the elongate third antennal segment; front wide in both sexes.

Homalactia Townsend

Frontal bristles extending to the middle of the parafacials.

Lypha Desvoidy

Frontals not extending below the base of the arista. Hineomyia Townsend

Parafrontals pollinose ......................................................... 210
Parafrontals bare; pteropleural long; apical cell terminating near the wing-tip; abdomen shining black .............................................. Polidaria n. g.

Fifth longitudinal vein bare ......................................................... 212
Fifth longitudinal vein setose ......................................................... 211

*Aldrich and Webber, 1924, Pr. U. S. N. M., lxiii, Art. 17, pp. 45, 51 (Phorocera).
†Aldrich and Webber, 1924, Pr. U. S. N. M., lxiii, Art. 17, pp. 45, 51.
211. Penultimate aristal segment nearly three times as long as wide.  
   *Acronaristopsis* Townsend  
   Penultimate aristal segment less than twice as long as wide.  
   *Minthoplagia* Townsend  

212. Posterior sublateral bristle present.................................225  
   Posterior sublateral bristle absent................................213  

213. Penultimate aristal segment not over twice as long as wide........214  
   Penultimate aristal segment and the preceding one more than twice  
   as long as wide..............................................*Ostracophyto* Townsend  

214. Oral margin strongly produced; face never carinate...............215  
   Oral margin not or but little produced; face sometimes carinate.....217  

215. Abdomen broad and thick; robust species, usually with four post-  
   sutural dorsocentrals; three or more sternopleurals................216  
   Abdomen elongate and narrow; three sternopleural and three pairs of  
   post sutural dorsocentrals....................................*Eriothrix* Meigen  

216. Normally only three postsutural dorsocentrals; parafacials almost  
   as wide as the length of the third antennal segment.  
   *Metaphyto* Coquillett  
   Four postsutural dorsocentrals; parafacials narrower than width of  
   third antennal segment.......................................*Ernestia* Desvoidy  

217. Posthumeral bristle present; bend of fourth vein sub-angulate.....218  
   Posthumeral bristle absent.....................................222  

218. Two sternopleurals, rarely a very weak third.......................221  
   Three sternopleurals; male abdomen strongly produced apically.....219  

219. Apical cell ending very close to the wing-tip......................*Cleonice* Desvoidy  
   Apical cell ending far before the wing-tip........................220  

220. Prosternum with bristly hairs.....................................224  
   Prosternum bare (65, 66)......................................*Uramya* Desvoidy  

221. Prosternum bare (178, 181)......................................†*Pseudeuantha* Townsend  
   Prosternum haired; lower squamal lobe haired above toward the outer  
   edge; large, robust, tropical species..........................*Tropidopsis* Townsend  

222. Third abdominal segment with two or three arched rows of long  
   discals..............................................................*Grisdalemyia* Curran  
   Third abdominal segment with one or two pairs of discals; pro-  
   sternum bare....................................................223  

223. Three sternopleurals..............................................224  
   Two sternopleurals...............................................‡*Hyalurgus* Brauer & Bergenstamm  

224. Discals present on second to fourth abdominal segments.  
   *Xanthocera* Townsend  
   Discals absent....................................................*Euthelairopsis* Townsend  

225. Second antennal segment usually less than half as long as the third..227  
   Second antennal segment almost as long as the third.................226  

† Aldrich, 1921, Ins. Ins. Mens., ix, p. 87.  
‡ Pseudeuantha may trace here but has white haired pleura.
226. Head as long below as at the antennae; antennae arising below the middle of the eyes. *Tricogena* Rondani
Head shorter below than at antennae; abdomen flattened.

*Nemorilla* Desvoidy

227. Vibrissae situated at most slightly above the oral margin.  
Vibrissae situated more than half the length of the second antennal segment above the oral margin.

228. Abdomen with strong discals.†*Macromeigenia* Brauer & Bergenstamm
Abdomen without discals on the intermediate segments.

*Bolomyia* Brauer & Bergenstamm

229. Apical abdominal segment closing slit-like, deeper than wide.
Apical abdominal segment not closing slit-like, wider than deep at the base.

230. Several coarse setulae below the frontals; facial depression very deep; parafacials as wide as the facial depression.  
No hairs below the frontals; parafacials not over half as wide as the shallower facial depression.  

*Leptostylum* Macquart

231. Anterior tibiae with at least two posterior bristles.
Anterior tibiae with a single posterior bristle.

232. Third antennal segment more than twice as long as wide (57, 94).

‡*Zenillia* Desvoidy

Third antennal segment subtriangular, almost as wide as long.

*Obolocera* Townsend

233. Discals absent; abdomen broad; cheeks linear (171, 182).
Discals present; cheeks at least one-fifth the eye-height.

*Anadiscalia*, n. g.

234. Frontal vitta of male very narrow; female with stout spines on the apex of the middle coxae; abdomen broad (136, 137, 153, 175).

*Doryphorophaga* Townsend

Frontal vitta not unusually narrow; female without spines on middle coxae.

*Ptilodegeeria* Brauer & Bergenstamm

235. Parafacials with hair or bristles on the lower half.
Parafacials bare on the lower half.

236. Ocellar bristles present, directed obliquely forward or divergent.
Ocellar bristles directed obliquely backward, absent or hair-like.

237. Ocellars directed obliquely backward.
Ocellars hair-like or absent.

238. Facial ridges with strong bristles on the lower half, or the penultimate aristal segment not over twice as long as wide; head not strongly inflated in appearance.
Facial ridges bristled on less than the lowest fourth, the head inflated in appearance; penultimate aristal segment always more than three times as long as wide (12, 13).

*Gonia* Meigen

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* Aldrich & Webber, 1924, Pr. U. S. N. M., lxiii, Art. 17, p. 5.
‡ Aldrich & Webber, 1924, Pr. U. S. N. M., lxiii, Art. 17, p. 11.
239. Apical cell open or closed in the wing margin (3, 46).
   **Spallanzania** Desvoidy
   Apical cell rather long petiolate..........................**Aravaipa** Townsend

240. Arista plumose or strongly pubescent, the clypeal region as long as the distance from the upper pair of vibrissae to the antennal base...249
   Arista bare or weakly pubescent; oral margin produced and not narrowed ..................................................241

241. Apical cell petiolate......................................................242
   Apical cell open...........................................................243

242. Prosternum bare..........................**Neometachaeta** Townsend
   Prosternum with hair and a long bristle on the sides...**Epidexia** Townsend

243. Palpi absent or very slender on their whole length.........................244
   Palpi normal, enlarged apically........................................247

244. Palpi extremely short or absent, never more than twice the length of the thickness of the proboscis at point of attachment................245
   Palpi elongate and slender, very rarely short; parafacials always with two or more bristles below (7)..............................*Peleteria* Desvoidy

245. Parafacials with one or more bristles below (39, 61).**Cuphocera** Macquart
   Parafacials without bristles below..................................246

246. Abdomen without discal bristles.................................**Euepalpus** Townsend
   Abdomen with discal bristles on intermediate segments.
   **Xanthozona** Townsend

247. Parafacials with one or more bristles in addition to the hair.
   **Chaetoprocta** Brauer & Bergenstamm
   Parafacials with fine hair only....................**Chaetoprosopa** Townsend

248. Clypeal region not long and narrow, short and not conspicuous, cheeks rarely more than half as wide as the eye-height..........................251
   Clypeal region long and narrow; cheeks two-thirds as wide as the eye-height ..................................................249

249. Posterior sublateral bristle absent..................................250
   Posterior sublateral bristle present; sternites with at most weak bristles (99)..................................................†**Microphthalma** Macquart

250. Sternites with long, very strong bristles..............**Megalprosopus** Macquart
   Sternites without strong bristles..................................†**Megaparia** Wulp

251. Palpi normal in shape and length......................................254
   Palpi absent or reduced to about half the normal length, wholly slender and bearing only one or two apical bristles..................252

252. Apical cell open.........................................................253
   Apical cell long petiolate (115)..............................**Melanophora** Meigen

253. Palpi absent or extremely small; large, robust, Archytas-like species, the apical cell ending far before the wing-tip...**Vibrossomyia** Townsend
   Palpi about half the normal length; apical cell ending close to the wing-tip ..................................................**Atrophopalpus** Townsend

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254. Ultimate section of fifth vein less than half as long as the preceding section .................................................................261
Ultimate section of fifth vein or its fold more than half as long as the preceding section .........................................................255

255. Parafacials with one or more downwardly directed bristles .................................256
Parafacials with only short hairs .........................................................260

256. Pteropleural bristle extending to the apex of the squamae ...........................................257
Pteropleural bristle of normal length .............................................................................258

257. Posterior crossvein lying wholly beyond the anterior crossvein. 
Blepharigena Rondani
Posterior crossvein situated partly before the anterior crossvein (73, 74) ..............Goniochaeta Townsend

258. Arista short plumose ..........................................................Microchæta Wulp
Arista bare .........................................................................................259

259. Parafacials more than two-thirds as wide as the facial depression. 
Cockerelliana Townsend
Parafacials narrow (type Voria neotropica Curran) ..........................Vorialia, n. g.

260. Proboscis long and slender; first vein setulose (69, 79). 
Plagiomima Brauer & Bergenstamm
Proboscis short and stout; first vein bare ..........................Metaplagia Coquillett

261. Face strongly carinate, the arista plumose .................................................................262
Facial carina weak or absent; arista bare to plumose ..............................................263

262. Apical cell closed and petiolate ...............Hesperodinera Townsend
Apical cell open (119, 124, 125, 133). ........................................Rhyynchiodexia Bigot

263. Facial ridges never strongly bristled on the lower half, if almost so the bristles becoming weak above. ..........................271
Facial ridges strongly bristled on lower half or more ..............................................264

264. Third antennal segment usually less than three times the length of the second; face only moderately retreating below; usually over 9 mm. in length; posthumeral bristle always strong ..........................265
Third antennal segment more than four times as long as the second, or if not the posthumeral bristle weak or absent; face very strongly receding .................................................................266

265. Apical cell long petiolate ....................................................Eleodiphaga Walton
Apical cell open or very short petiolate ....................................................................266

266. Parafacials much narrower than the facial depression. 
†Admontia Brauer & Bergenstamm
Parafacials as wide as the facial depression .................................................................267

267. Fifth vein setulose ..................................................Actinochaeta Brauer & Bergenstamm
Fifth vein bare .........................................................................................268

268. Penultimate aristal segment less than twice as long as wide, .........269
Penultimate aristal segment at least three times as long as wide (87). 
Chatogædia Brauer & Bergenstamm

269. Base of wings deep brown; abdomen piceous or largely castaneous
   (4) .................................................Leschenaultia Desvoidy
Base of wings never brown; abdomen largely gray pollinose, more or
less reddish laterally or apically............................................270

270. Apical cell ending far before the wing-tip; large species...Gaedia Meigen
Apical cell ending near the wing-tip; small species.
   *Admontia* Brauer & Bergenstamm

271. Apical cell closed and rather long petiolate..........................286
Apical cell open, closed in the margin or extremely short petiolate...272

272. Penultimate aristal segment not over twice as long as wide........273
   Basal two aristal segments each at least three times as long as wide.
   Digonichaeta Rondani

273. Posterior sublateral bristle very strong............................284
Posterior sublateral bristle absent; face strongly retreating......274

274. Third abdominal segment with at most two pairs of discals........275
Third abdominal segment with a row of discals...........Gibsonomyia Curran

275. At least the third abdominal segment with discals......................276
Intermediate segments without discals, the marginals rarely simulat-
ing discals .................................................................279

276. Both the second and third abdominal segments with discals or the
   marginals not situated far forward..........................Paralispidea Townsend
Second segment without discals but the marginals situated far for-
ward .................................................................277

277. Second antennal segment almost or quite half as long as the third...278
   Second antennal segment not nearly half as long as the third.
   Phyllomya Desvoidy

278. Cheeks about half as wide as the eye-height...Eubrachymera Townsend
Cheeks not one-third as wide as the eye-height........Peteina Meigen

279. Apical cell petiolate..................................................280
Apical cell open.........................................................281

280. Arista almost wholly thickened............Hypertrophocera Townsend
Arista thin on apical fourth or more (23, 24)...Ceratomyiella Townsend

281. Presutural acrosticals present.................................282
Presutural acrosticals absent......................................Peteina Meigen

282. Arista more or less distinctly plumose..............................283
Arista bare or practically so, thickened on almost its whole length.
   Hypertrophocera Townsend

283. First and fifth veins setose...........Actinocheta Brauer & Bergenstamm
First and fifth veins bare............................Phasiophyto Townsend

284. Parafacials with fine hairs only.................................285
Parafacials with three or more downwardly directed bristles (83, 86).
   Chaetoplagia Coquillett

285. Intermediate abdominal segments with discals; no orbitals in male.
   †Spathimeigenia Townsend

† Aldrich, 1931, Pr. U. S. N. M., lxxx, Art. 11, p. 3.
Intermediate abdominal segments without discals; a row of orbitals in male (Eupogona auct.) .......................... Eupogona Rondani

286. Parafacials at least half as wide as median depression, with scattered bristly hairs; abdomen largely pollinose..................... 288
Parafacials less than one-third the width of the median depression, with a row of bristles; abdomen shining..................... 287

287. Third antennal segment at least twice as long as the second; front of both sexes at least two-thirds as wide as either eye (40, 41).

*Wagneria Desvoidy
Third antennal segment but little longer than the second; front strongly narrowed in both sexes..................†Hesperophasia Townsend

288. Two or three presutural acrosticals and dorsocentals.................. 289
No presutural aerosticals and only two pairs of weak presutural dor-
socentals (58, 59)........................................ Penthosia Wulp

289. Proboscis not longer than length of head; parafacials about two-
thirds as wide as median depression...................... 290
Proboscis much longer than the head-height; parafacials as wide as
the median depression.................................. Trochilodes Coquillett

290. Face receding, longer than the front (84, 85)........................ Euthyprosopa Townsend
Oral margin prominent, the face shorter than the front.

Steveniopsis Townsend

291. Thorax without plumose hairs........................................292
Thorax in part with plumose yellowish hairs............ Teleothyria Wulp

292. Facial ridges bristled on less than the lower half, the bristles almost
always decreasing in length above; oral vibrissæ always strongly
developed ............................................. 341
Facial ridges with strong bristles on the lower half or more or the
vibrissæ very weak or absent........................................ 293

293. Oral vibrissæ strongly differentiated and long.................. 297
Oral vibrissæ not differentiated........................................ 294

294. Facial ridges with two or three rows of hairs on the lower half, the
parafacials “rolled” over the ridges above...................... 295
Facial ridges with a single row of bristles on the lower half, the
ridges continuous to the base of the antennæ, not hidden on the
upper half by the parafacials; presutural acrosticals present..... 296

295. Arista pectinate.............................................. Trixodes Coquillett
Arista pubescent .............................................. Trixa Meigen

296. Apical cell long petiolate; arista about half as long as the third an-
tennal segment .............................................. Paraphasmophaga Townsend
Apical cell short petiolate; arista much longer than antenna (26, 27).

(Estrophasia Brauer & Bergenstamm

297. Ocellars well developed, directed obliquely forward, rarely almost
divergent ..................................................... 304
Ocellars reclinate, absent or scarcely differentiated............. 298

298. Ocellars absent or extremely weak.................................. 300
Ocellars reclinate............................................. 299

299. Penultimate arista segment elongate..............Distichona Wulp
Penultimate arista segment not over twice as long as wide.
Vibrissovoria Townsend

300. Cheeks not wider than the third antennal segment........302
Cheeks much wider than the third antennal segment........301

301. Posterior tibiae evenly, closely ciliate; parafacials narrow; smaller
species ........................................Sturmia Desvoidy
Posterior tibiae not closely ciliate; parafacials wide; large species.
*Belvosia Desvoidy

302. Both sexes with reclinate orbital bristles................303
Neither sex with reclinate orbitals..........................Prosopoea Rondani

303. Ocellars entirely absent..............................Pseudecheta Townsend
Ocellars very small but distinct and cruciate; male with two reclinate
and one proclinate orbital..............................Argyrochetona Townsend

304. Apical crossvein present...............................306
Apical crossvein absent..................................305

305. Parafacials much wider than antennae..................Roeseliopsis Townsend
Parafacials very narrow below............................Schizotachina Walker

306. Posterior tibiae not ciliate, or if so the bristles are rather widely
separated with two or more of them longer or the parafacials are
not hairy below the frontal bristles........................308
Posterior tibiae evenly closely ciliate, at most one of the bristles con-
spicuously longer than the rest; parafacials usually haired on the
upper half ........................................307

307. Cilia on posterior tibiae long, very dense and contiguous; parafacials
usually with hairs below the frontals (Thysanopsis Tns., Blephari-
peza Macq.) (4)......................................Leschenualtia Desvoidy
Cilia less numerous, not quite contiguous; parafacials rare (109).
†Achaeoneura Brauer & Bergenstamm

308. Frontal bristles extending but little below the base of the third anten-
nal segment, usually a single bristle below the base; fourth vein
without a fold or the facial ridges bristled on more than the lower
half .........................................................309
Frontals extending to the middle of the third antennal segment, at
least two bristles below the base of the arista; eyes sparsely short
haired; bend of fourth vein with a long fold; facial ridges usually
bristled on the lowest third..............................Exorista Meigen

309. Middle coxae without stout apical spines..................310
Middle coxae with short, stout curved spines on the apex (♀) (136, 137,
153, 175)..............................................Doryphorophaga Townsend

310. First vein with at most two or three weak bristles........311
First vein bristled on at least the apical half..............Chaetophleps Coquillett

311. Appendage or fold of fifth vein less than one-third as long as the
preceding section .......................................313
Appendage or fold of fifth vein more than half as long as the preced-
ing section ...........................................312

312. Eyes quite bare; ultimate section of fifth vein only about half as long as the preceding section........................................315
Eyes with short, sparse hair; apical section of fifth vein two-thirds as long as preceding section (97, 98)............Stomatomya Rondani

313. Apical cell open or closed in the wing margin.........................317
Apical cell closed and petiolate........................................314

314. Arista almost wholly thickened........................................315
Arista slender on apical fourth or more.
Anachetopsis Brauer & Bergenstamm

315. Arista slender on apical half or more.............Phoeniceomyia Townsend
Arista almost wholly thickened........................................315

316. Penultimate aristal segment four times as long as wide (114).
Penultimate aristal segment not twice as long as wide.
Archiclops Bischoff

317. Proboscis shorter than the head-height..............................318
Proboscis twice as long as the head-height; aristal segments of almost equal length.........................Eucoronomyia Townsend

318. Males ........................................................................319
Females ........................................................................332

319. Orbital bristles present although sometimes situated almost in the frontal row ........................................320
Orbitals absent ...................................................................325

320. Abdomen with discals, not unusually deep.........................321
Abdomen without discals, elongate and deep; antennæ arising below the middle of the eyes; two pairs of presutural acrosticals and dorsocentrals ............Chetognodexodes Townsend

321. Anterior tibiae with two or three strong posterior bristles........322
Anterior tibiae with a single posterior bristle......................322

322. Third antennal segment divided into two lobes...........Schizotachina Walker
Third antennal segment entire, not unusually wide...Celatoria Coquillett

323. Frontal vitta wider anteriorly than the least width of either parafrontal .....................................................324
Frontal vitta nowhere wider than the least width of either parafrontal, not widening anteriorly......Paralispe Brauer & Bergenstamm

324. Front almost or quite as wide as either eye............Racodineura Rondani
Front less than two-thirds as wide as either eye (Arrhinomyia B. B.) (149, 173).................................*Elodia Desvoidy

325. Second antennal segment not unusually bristly above but with some longer bristles apically.........................326
Second antennal segment densely bristled above; facial ridges with bristles on more than the lower half (9).....†Tachinomyia Townsend

* Villeneuve and Aldrich (1929, 1933) recognize Arrhinomyia as distinct from Elodia but I see no reason for this.
326. Anterior tibiae with at least two posterior bristles; species over 5 mm. in length ..................................................328
327. Apical cell ending very close to the wing-tip...........Oxynops Townsend
328. Anterior tibiae with a single posterior bristle; species about 4 mm. in length ........................................327
329. Apical cell ending far before the wing-tip................Bessa Desvoidy
327. Abdomen tapering or not, often with discals; posterior forceps split
    on apical portion, never laterally compressed................329
328. Abdomen elongate, tapering, rarely with discals; posterior forceps of
    male united into a long, compressed organ (9).*Tachinomyia Townsend
329. Apical scutellars cruciate......................................330
330. Apical scutellars absent or divergent..................331
331. Parafacials wide, the cheeks two-thirds as wide as the eye-height,
    the parafacials setulose on the upper half..............Centeter Aldrich
332. Genital opening not slit-like; abdomen broader than deep........334
333. Orbitals scarcely divergent; abdomen rarely with discals (9).
334. Genital opening slit-like; abdomen broad and deep........333
335. Orbitals conspicuously divergent; abdomen always with discals.
336. Parafacials narrower, bare below the lowest frontals........337
337. Parafacials almost as wide as the median depression, setulose on
    almost the upper half.................................Centeter Aldrich
338. Middle tibiae with two strong anterodorsal bristles.Frontinicella Townsend
339. Middle tibiae with only one strong anterodorsal bristle, Oxynops Townsend
339. Lower margins of the second tergite strongly produced downward and
    with numerous spinose setulae; ovipositor long and slender, often
    hidden ..................................................Celatoria Coquillett

Tergites not produced downward, the edges rarely setulose; ovipositor not elongate .................................................. 340

340. Face narrower than either eye; penultimate arista segment short (149, 173). ........................................... Elodia Desvoidy
   Face wider than either eye; penultimate arista segment elongate.
   Schizotachina Walker

341. Apical crossvein present........................................ 347
   Apical crossvein absent........................................ 342

342. Posterior crossvein present.................................... 343
   Posterior crossvein absent.................................... Phytomyptera Rondani

343. Antennae reaching the lowest fifth of the face...................... 344
   Antennae not reaching below the lowest third of the face.
   Hemithrixion Brauer & Bergenstamm

344. A single bristle at the base of the third vein...................... 345
   Three or more bristles on the third vein...................... 346

345. Parafacials narrower than the third antennal segment.
   Schizotachina Walker
   Parafacials twice as wide as the third antennal segment.
   Roeseliopsis Townsend

346. Antennae arising near upper edge of eyes, enormous in size; head almost rectangular; bristles of thorax not unusually depressed (28, 29, 144) ........................................ Euryceromyia Townsend
   Antennae arising lower down; head not nearly rectangular; bristles of thorax depressed (148, 189).......................... Actia Desvoidy

347. Palpi present and well developed.................................. 354
   Palpi absent or but little longer than the width of the proboscis at point of attachment ........................................ 348

348. Arista bare or pubescent.......................................... 349
   Arista plumose; face strongly carinate.......................... Prosenia Serville

349. Third antennal segment usually less than three times the length of the second, if long the abdomen pedunculate.......................... 350
   Third antennal segment five times the length of the second, broadened apically, concave above (47, 70).......................... Beskia Wulp

350. Apical cell open .................................................. 351
   Apical cell closed and petiolate (51)......................... * Cylindromyia Latreille

351. Face not conspicuously receding, concave in profile, the oral margin produced; vibrissae situated well above the oral margin........... 352
   Face receding; oral margin not produced; vibrissae level with oral margin (63, 64).............................................. Icelia Desvoidy

352. Second abdominal segment strongly narrowed.... Polistioptsis Townsend
   Second abdominal segment not narrowed, much broader than deep.... 353

353. Palpi entirely absent............................................. Paraphasiopsis Townsend
   Palpi narrow, four times as long as wide, or longer. Phasiopsis Townsend

354. Apical cell at most with an extremely short petiole .......................................................... 359
    Apical cell with a petiole almost one-third the length of the apical crossvein .......................................................... 355
355. Antennæ shorter than the face, the middle of the face depressed; vibrissæ situated on a level with or above the anterior oral margin. 356
    Antennæ longer than the face; middle of face longitudinally convex, not depressed; vibrissæ situated below the anterior oral margin;
    wings pictured (80, 81) .......................................................... Euthera Loew
356. Ocellar bristles procinate .......................................................... 357
    Ocellar bristles directed more or less backward (67, 68).

Leucostoma Meigen

357. Third vein ending in the wing-tip; oral margin produced .......................................................... 358
    Third vein ending well before the wing-tip (44, 53) .......................................................... Vanderwulpia Townsend
358. Front of female wide; four pairs of marginal scutellars .......................................................... Psalidopteryx Townsend
    Front of both sexes strongly narrowed; three pairs of marginal scutellars .......................................................... *Clistomorpha Townsend
359. Ultimate section of the fifth vein less than half as long as the preceding section .......................................................... 360
    Ultimate section of the fifth vein three-fourths as long as the preceding section .......................................................... Catalinovoria Townsend
360. Penultimate aristal segment not over twice as long as wide .......................................................... 371
    Penultimate aristal segment three times as long as wide, or if somewhat shorter, widened apically and the proboscis geniculate 361
361. Proboscis not geniculate .......................................................... 362
    Proboscis long and geniculate, the labellæ turned back, narrow and more or less fused (78, 183) .......................................................... †Siphona Meigen
362. Proboscis, beyond the basal articulation, not as long as the head-height .......................................................... 364
    Apical section of the proboscis longer than the head-height .......................................................... 363
363. Antennæ reaching almost or quite to the oral margin; face not receding; parafacials at most one-third as wide as the third antennal segment (14, 82, 150, 171) .......................................................... Epigrimyia Townsend
    Antennæ not reaching to the moderately produced oral margin; parafacials more than half as wide as third antennal segment; face receding above (2) .......................................................... Aphria Desvoidy
364. Third antennal segment of the male not furcate .......................................................... 365
    Third antennal segment of the male furcate .......................................................... Acronarista Townsend
365. Third vein with not more than three bristles basally .......................................................... 368
    Third vein bristled more than half way to the small crossvein .......................................................... 366
366. Bristles of the thorax erect .......................................................... 367
    Bristles of the thorax rather appressed (148, 189) .......................................................... ‡Actia Desvoidy

367. Head about as long as high. \textit{Masistylum} Brauer & Bergenstamm
Head much higher than long. \textit{Phantasiomyia} Townsend

368. Cheeks less than half the eye-height in width. \textit{Phantasiomyia} Townsend
Cheeks nearly as wide as the eye-height \textit{(28, 29, 144)}. \textit{Euryceromyia} Townsend

369. Palpi normal. \textit{Masistylum} Brauer & Bergenstamm
Palpi very greatly swollen, unusually large. \textit{Lispidea} Coquillett

370. Third antennal segment more than twice as long as wide. \textit{Clausicella} Rondani
Third antennal segment less than twice as long as wide \textit{(16)}. \textit{Plectops} Coquillett

371. No appendage or fold at bend of fourth vein, if an adventitious appendage is present it is not continued in the same line as the fourth vein.\textit{An} \textit{Tachinomyia} Townend
An appendage or distinct fold at the bend of the fourth vein, the appendage continued in almost the same line as the preceding section of the vein.\textit{385}

372. Posterior pair of presutural acrostical bristles situated very close to the suture and much behind the posterior pair of presutural dorsocentrals. \textit{Exorista} Meigen
Posterior pair of presutural acrosticals almost in a line with the posterior presutural dorsocentrals or in front of them.\textit{373}

373. Frontal bristles extending almost to the middle of the third antennal segment; genital opening not slit-like. \textit{Ochrocera} Townsend
Frontals descending but little below the base of the third antennal segment; genital opening rather slit-like \textit{(9)}. \textit{Tachinomyia} Townsend

374. Arista with long rays. \textit{Exorista} Meigen
Arista pubescent or bare. \textit{Trichoduropsis} Townsend

375. Intermediate abdominal segments without discals. \textit{Tachinomyia} Townsend
Intermediate abdominal segments with paired discals; fourth vein with very short appendage, or none; face never carinate. \textit{Dexodes} Brauer & Bergenstamm

376. Cheeks not over one-third as wide as the eye-height. \textit{Catenophrys} Townsend
Cheeks about half as wide as the eye-height. \textit{Ochrocera} Townsend

377. Abdomen long and narrow; ultimate section of proboscis elongate. \textit{Catenophrys} Townsend
Abdomen oval; proboscis short and robust. \textit{Neophryxe} Townsend

378. Face not strongly carinate, more or less carinate in the middle above. \textit{Catenophrys} Townsend
Facial carina strongly developed and reaching to the clypeal region. \textit{Trichoduropsis} Townsend

379. Prosternum bare. \textit{Trichoduropsis} Townsend
Prosternum with two pairs of bristles. \textit{Trichoduropsis} Townsend

\# This genus was described from specimens reared in Massachusetts from material originating in Japan.
FAMILY TACHINIDÆ.—THE TACHINIDS 457

380. Pteropleural bristle extending to beyond the apex of the squamae; apical abdominal segment of the male very strongly produced.  

Trichodura Brauer & Bergenstamm  
Pteropleural bristle short as usual; abdomen not cylindrically produced in male. ........................................... Dexia Meigen

381. Abdomen slender basally, spatulate .............................................. 384  
Abdomen not spatulate, even though cylindrical .............................................. 382

382. Abdomen very slender and not tapering from near the base; costa with an extremely strong bristle near the base on the inner side (116) .............................................. Sophia Desvoidy  
Abdomen broader and more tapering; costal bristles short and fine .................. 383

383. Abdomen metallic blue (117, 177) .............................................. Zuanalia, n. g.  
Abdomen black in ground color (128, 131) .............................................. Zelia Desvoidy

384. Lower squamal lobe very small .............................................. Eucordyligaster Townsend  
Lower squamal lobe large as usual .............................................. *Cordyligaster Macquart

385. Vibrissal angles not unusually prominent, if situated high above the oral margin the facial depression is not deeply sunken below; head not twice as high as long; or if so the face strongly retreating ... 386  
Vibrissal angles high, the facial depression carried far below them at a much lower level; head twice as high as long; prosternum swollen .............................................. Ormia Desvoidy

386. Posterior pair of presutural acrostical bristles situated very close to the suture and much behind the posterior pair of presutural dorso-centrals; always three pairs of presutural dorso-centrals .................. 387  
Posterior pair of presutural acrosticals situated but little behind the posterior presutural dorso-centrals, or there are but two pairs of the latter; presutural acrosticals sometimes absent .............................................. 422

387. Vibrissae at most half the length of the second antennal segment above the anterior oral margin .............................................. 392  
Vibrissae situated high above the oral margin .............................................. 388

388. Antennæ reaching at least to the lowest third of the face, the second segment not nearly as long as the third; vibrissæ only moderately above the oral margin .............................................. 389  
Antennæ unusually small, the second segment almost as long as the third; vibrissæ situated very high above the oral margin (6).  
†Atacta Schiner

389. Abdomen without discals .............................................. 390  
Abdomen with discals .............................................. Meigenia Desvoidy

390. Parafrontals with numerous hairs on the anterior half .............................................. 391  
Parafrontals with but few hairs on the anterior half .............................................. Masiphya Brauer & Bergenstamm

391. Oral margin carried rather strongly forward below the vibrissæ.  
‡Siphosturmiopsis Townsend  
Oral margin not conspicuously produced .............................................. Sturmia Desvoidy

† Aldrich, 1925, Pr. U. S. N. M., lxvi, Art. 18, p. 29.  
‡ Reinhard, 1931, Pr. U. S. N. M., lxix, Art. 11, p. 9.
392. Posterior tibiae evenly and closely ciliate above with fairly long bristles, only one of which may be longer and stronger. 420
Posterior tibiae not evenly ciliate. 393

393. Arista bare or pubescent. 395
Arista plumose. 394

394. Cheeks half as wide as eye-height (128, 131). Zelia Desvoidy
Cheeks much narrower. Minthozelia Townsend 393

395. Apical cell ending far before the wing-tip. 409
Apical cell ending at or near the wing-tip. 396

396. Costal spine not strongly developed, never as long as the width of the costal cell and not outstanding, if somewhat long the parafacials are decidedly narrower than the width of the third antennal segment. Costal spine longer than the width of the costal cell. 398

397. Facial ridges convex in profile; discsals present. Phynofrontina Townsend
Facials ridges concave below; discsals absent (48, 49). Spathidexia Townsend 398

398. Female abdomen not strongly keeled. Female abdomen strongly keeled, the edges of the tergites spined. Jicaltepecia Townsend 399

399. First vein bare. First vein with strong bristles on the apical half; antennae arising above the middle of the eyes. Clausicellana Curran 400

400. Lower margin of head not strongly oblique on anterior half; posterior sublateral present. Lower margin of the head strongly oblique on the anterior half; posterior sublateral absent; three pairs of scutellars. Pelatachina Meade 401

401. Apical abdominal segment horizontal, the genital opening visible from posterior view. Apical abdominal segment vertical, the genital opening wholly ventral. Panacemyia Townsend 402

402. Male with orbitals (rarely with a single one in the frontal row); outer verticals of ♀ two-thirds as long as the verticals. Male without orbitals; outer verticals of ♀ little more than half as long as verticals. 403

403. Third antennal segment at least three times as long as wide, or not unusually large. Third antennal segment very large, long and almost half as wide as its length. *Elephantocera Townsend 404

404. Palpi not unusually swollen; third vein with two or three basal setulæ. Palpi greatly swollen; third vein setulose to small crossvein. 405

405. Tergites of female produced downward and finely spined.  
Schizocerophaga Townsend
Tergites of female normal.............................................. 406. Third vein bristled to the small crossvein; facial ridges convex in profile ......................................................... Hypertrophomma Townsend
Third vein with only two or three basal bristles; sublateral bristle present ................................................................. 407
407. Facial depression deep, the parafacials prominent in profile.  408. Facial depression shallow, the parafacials very low in profile, the ridges flat; head short (158, 165) ..................................... Patillalia, n. g.
408. Frontal vitta linear.................................................. Argyrocheta Townsend
Frontal vitta not remarkably narrow.................................. Microceromacia Villeneuve
409. Head receding below .................................................. 410
Head as long below as at the oral margin. .......................... 410
410. Abdomen with strong marginals on the intermediate segments. 411. Abdomen without strong marginals on the intermediate segments; vibrissæ situated far above the oral margin.
Masiphya Brauer & Bergenstamm
411. First vein setulose except apically................................. Microsillus Aldrich
First vein bare ................................................................. 412
412. Ocellars present ......................................................... Myothyriopsis Townsend
Ocellars absent ............................................................... 413
413. First vein bare ................................................................. Houghia Coquillett
First vein setulose ......................................................... 414
414. Front scarcely longer than the face, more or less convex, not prominent anteriorly ......................................................... 415
Front longer than the face, not convex in profile, produced anteriorly; abdomen with discals; apical scutellars erect ............ Meigenia Desvoidy
415. Ocellars absent or very weak........................................... 416
Ocellars present; discals present or absent. .......................... 416
416. Face unusually flat, the head short; parafacials very narrow below (158) ................................................................. 417
Face not unusually flat, the head more elongate (1)................ Lydella Desvoidy
417. Third vein bristled to small crossvein. ............................. 418
Third vein with two or three very strong basal bristles (158, 165). Patillalia, n. g.
418. Ocellars very strong (160, 179)...................................... Agrarialia, n. g.
Ocellars short and rather weak (143, 168).......................... Aridalia, n. g.
419. Abdomen with discals .................................................. Parathelaira Townsend
Abdomen without discals .................................................. 420
420. Parafrontals each much less than four times as wide as the frontal vitta; front not convex; ocellars present.................. 421

Parafrontals wide, the median vitta less than one-fourth as wide as the parafrontals at the middle; ocellars absent; front gently convex.

Argyrophylyx Brauer & Bergenstamm

421. Oral margin rather strongly produced..........................Siphosturmi.a Coquillett
Oral margin but slightly produced.................................Sturmi.a Desvoidy

422. Face at least moderately retreating..................................................449
Face but little retreating, almost or quite as long below as at base of antennæ ........................................423

423. Apical section of the proboscis much shorter than the head-height or
the apical cell ending far before the wing-tip........................427
Apical section of the proboscis at least as long as the head-height;
apical cell ending close to the wing-tip...............................424

424. First vein bare above.............................................................425
First vein pubescent above..................................................Leskiomima Brauer & Bergenstamm

425. Arista bare or pubescent..........................................................426
Arista with very long rays (176, 185)...................Shermanalia, n. g.

426. Head decidedly higher than long (14, 82, 150, 171). Epigrimyia Townsend
Head as long below as its height..............................Weberia Desvoidy

427. Parafacial decidedly less than half as wide as the facial depression;
face not strongly carinate....................................................432
Parafacial at the narrowest part almost or quite half as wide as the
facial depression, or the face strongly carinate......................428

428. Arista long plumose..............................................................429
Arista pubescent or bare.....................................................Apachemyia Townsend

429. Facial carina weak (128, 131)...............................Zelia Desvoidy
Facial carina strong .............................................................430

430. Antennæ reaching little more than half way to the oral margin.....431
Antennæ reaching three-fourths of the way to the oral margin (120,
129) .................................................................Scotiptera Macquart

431. Third antennal segment three times as long as the second.

Eudexia Brauer & Bergenstamm
Third antennal segment not three times longer than wide, in the male
only slightly longer than the second (127, 130). Hystrichodexia Röder

432. Apical cell ending in or near the wing-tip.................................435
Apical cell ending well before the wing-tip..........................433

433. Third vein with only a few basal bristles..................................434
First and fifth veins bristled above (123).......................Thelaira Desvoidy

434. Frontal vitta not wider than either parafrontal...........Demoticus Macquart
Frontal vitta twice as wide as either parafrontal; a row of orbitalas.

Euhalidaya Walton

435. Third antennal segment near the base not wider than the second, or
if so, the abdomen elongate and narrow.........................437
Third antennal segment conspicuously wider than the second; abdo-
men short, oval ..........................................................436

436. Presutural acrosticals scarcely developed............Chaetostigmoptera Townsend
Presutural acrosticals well developed (118, 189). ..........*Actia Desvoidy

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437. Apical abdominal segment horizontal, the genital opening evident from posterior view ................................................. 438
Apical abdominal segment vertical at apex, the genital opening ventral (117, 126) ......................................................... 438

438. Costal spine not strongly developed; oral margin prominent; wings not brown with pale spots .................................. 439
Costal spine long; oral margin and vibrissal angles scarcely raised; wings brown with hyaline spots ................................ 439

439. Largely yellowish species ........................................... 441
Wholly black species; wings partly brown ............................. 440

440. First vein bare; third with a single basal bristle (Plectops?).
First vein setulose .......................................................... 441

441. Third antennal segment narrower than the second or the fifth vein bare ................................................................. 442
Third antennal segment wider than the second, the fifth vein setulose ................................................................. 442

442. Head at most one and one-half times as high as long ............ 443
Head almost twice as high as long ........................................ 443

443. Palpi variable, sometimes shortened, usually curved, never broad and flattened ...................................................... 444
Palpi long, broad and flattened on the apical half or more, never curved (112) ......................................................... 445

444. At most two presutural acrostical or dorsocentral bristles ....... 446
Three presutural acrostical and dorsocentral bristles .............. 445

445. Abdomen with discals (36) ........................................ Binghamimyia Townsend
Abdomen without discals .................................................. Pyrrhosia Rondani

446. Abdomen cylindrical or wider than deep apically ............... 447
Abdomen laterally compressed on the apical half; small, slender species ................................................................. 447

447. First abdominal segment with marginals ................................ 448
First abdominal segment without marginals (93) ................... Fischeria Desvoidy

448. Three sternopleurals ................................................... Solieria Desvoidy
Two sternopleurals ......................................................... Opsoleskia Townsend

449. Arista bare or pubescent ............................................. 450
Arista plumose, very long pubescent or short pectinate .......... 450

450. Arista plumose or pectinate .......................................... 451
Arista long pubescent; antennae arising at the lowest third of the eyes; clypeal region long ........................................ Eumegaparea Townsend

451. Abdomen without discals ............................................ 452
Abdomen with discals (132) ............................................. Chatona Wulp

452. No strong presutural acrosticals ................................... Phyllophilopsis Townsend
At least one pair of strong presutural acrosticals ................. 453

453. Ocellars weak or absent .............................................. 454
Ocellars well developed ................................................. Pseudodexia Brauer & Bergenstamm

454. Fifth vein bristled..................Polygastropsis Townsend
   Fifth vein bare..........................455

455. Apical abdominal segment of the male very strongly produced pos-
       teriorly; ocellars small..................Urophilophila Townsend
   Apical abdominal segment not produced; ocellars absent.
   Opsoleskia Townsend

456. Third antennal segment never with the apical corner acutely pro-
       duced ........................................ 458
   Apex of the third antennal segment produced as a short, sharp spur
   (5) ...........................................457

457. Prosternum bare ..........................Acemya Desvoidy
   Prosternum haired (Myothyria Wulp) ........Ceracia Rondani

458. Apical cell ending at or near the wing-tip..................458
   Apical cell ending far before the wing-tip; cheeks usually twice as
   wide as third antennal segment; abdomen with discals; two pre-
   sutural acrosticals and three dorsocentals.
   *Dexodes Brauer & Bergenstamm

459. Third antennal segment rarely unusually wide and long, if so the
   palpi yellow or the facial depression not unusually deep ........460
   Third antennal segment more than six times as long as the second,
   unusually wide; facial depression very deep; palpi white.
   Edematoecera Townsend

460. Over 9 mm. in length; apical cell narrowly opened or closed in the
   costa; discal crossvein joining the fourth vein three-fourths the
distance beyond the small crossvein; abdomen with discals.
   Pelatachina Meade
   Usually less than 8 mm. in length; not possessing the above combi-
   nation of characters..........................461

461. Cheeks not over one-third as wide as the eye-height..............462
   Cheeks two-thirds as wide as the eye-height..................Clista Meigen

462. Second abdominal segment with dorsal bristles..................463
   Second abdominal segment without dorsal bristles.Calpodomyia Townsend

463. Bristles of the thorax suberect; first and fifth veins never bristled...464
   Bristles of the thorax subpressed; first and fifth veins often bris-
   tled (148, 189) (cf.Spathidexia)..................†Actia Desvoidy

464. Ventral margin of at least the second tergite in the female with
   stout, spinose setulae; knob of halteres brown in male.............465
   Tergites without such setulae in female; halteres yellow..........466

465. Second antennal segment of male large, half as wide as long.
   Elephantocera Townsend
   Second antennal segment of male not large, three times as long as
   wide .........................................Celatoria Coquillett

466. Arista bare, short pubescent or extremely short plumose..........468
   Arista very conspicuously short plumose; genital opening apical...467

467. Three pairs of strong presutural acrosticals (151, 157).
   Thelairalia, n. g.
At most two pairs of strong presutural acrosticals, the posterior pair not situated very close to the suture (132)..............Chaetona Wulp

468. Arista wholly thick, tapering apically........Phantasiomyia Townsend
Arista slender apically ........................................469

469. Genital opening ventral, not visible from behind...Panacemyia Townsend
Genital opening apical, visible from behind..................470

470. Frontal vitta linear (very narrow in ♀ ?).........Argyrochætona Townsend
Frontal vitta wide.................................................471

471. Anterior tibiae with a single posterior bristle..................473
Anterior tibiae with two posterior bristles..................472

472. Small slender species, under 5 mm. (149, 173).....Elodia Desvoidy
Larger, robust species, over 6 mm......................Calothelaira Townsend

473. Frontal vitta twice as wide as the parafrontals, not at all narrowed medianly; anterior tibiae without a conspicuous posterodorsal bristle (181, 193)................Microtownsendia, n. g.
Frontal vitta narrower than either parafrontal; anterior tibiae with a single conspicuous posterodorsal bristle situated near the middle.

Tachinophyto Townsend

Scotiptera melaleuca.
Collatia, new genus

This genus is proposed for the reception of Zenillia subnissa Aldrich and Webber. It possesses the characters of Zenillia but has the propleura haired on the middle portion.

Townsendina, new genus

Differs from Myiophasia Brauer and Bergenstamm in having only one pair of presutural acrosticals and long, bristly hairs on the parafacials. Front narrow above, widening anteriorly; cheeks half as wide as the eye-height; antennae reaching four-fifths the distance to the oral margin, the second segment only one-third shorter than the third; arista thickened on basal fourth; proboscis short; eyes short pilose. Dorsocentrals 3-3; acrosticals 1-2; propleura bare; infrasquamal setulae present. Apical cell ending moderately before the wing tip; third vein with two bristles basally. Abdomen with discals and marginals. Thorax cinereous pollinose, weakly vittate; abdomen with broad, basal cinereous fasciae on segments two to four. Genotype:—T. fasciata, n. sp., (Colorado).

Polidaria, new genus

Proposed for Tachina arcos Walker, a species placed in the genus Polidea by most authors. As it does not belong to Polidea, a new genus is proposed for its reception.

Zonalia, new genus

Female.—Head short, almost twice as high as long; two pairs of proclineate frontals; ocellars short; outer verticals absent; cheeks narrow; face slightly retreating below; facial ridges with weak bristles on the lower half; antennae reaching to the oral margin; arista long plumose. Acrosticals 1-0; dorsocentrals 2-3; one sublateral; posthumeral absent; propleura bare; infrasquamal setulae present; two sternopleurals; prosternum bare; three pairs of marginal scutellars. Anterior tibiae with one posterior bristle. Apical cell ending close to the wing-tip; third vein bristled more than half way to the anterior crossvein. Abdomen without discals; first segment without marginals; ovipositor normal. Front, thorax and sides of abdomen with whitish pollen, although the whole insect appears shining black from most views. Length, 5 mm. Genotype:—Z. nitens, n. sp. (Panama).
Corozalia, new genus

Male.—Eyes haired; front moderately narrow, without orbitals or ocellars; outer verticals absent; cheeks narrow; face moderately retreating, the oral margin produced; facial ridges bare; antennae reaching lowest fifth of face, the second segment somewhat less than half as long as the third; arista practically bare; proboscis short; palpi clavate. Acrosticals and dorsocentrals 3-3, the posterior acrosticals close to the suture; posterior sublateral present; posthumeral absent; sternopleurals 2-1; infrasquamal setulae present. Anterior tibiae with one long posterior bristle. Apical cell ending moderately before the wing-tip; third vein with two basal bristles. Abdomen elongate, tapering, with paired discals; first segment with marginals. Black, with cinereous pollen, the mesonotal pollen sometimes with yellowish tinge, with narrow, distinct vittæ; apical half of abdominal segments bare. Length, 8 to 10 mm. Genotype:—C. longula, n. sp. (Panama).

Chaetonalia, new genus

Male.—Head almost twice as high as long; cheeks very narrow; face and front narrow; no orbitals; ocellars very small and hair-like; outer verticals not developed; face slightly reeding below, the ridges bare; antennae long, the second segment short; arista short plumose on basal half; proboscis short; palpi slightly clavate. Acrosticals 1-1; dorsocentrals 2-3; posterior sublateral and posthumeral absent; two sternopleurals; infrasquamal setulae present. Apical cell ending a little before the apex of the wing; third vein with two basal bristles. Abdomen with paired discals; first segment with pair of marginals. Pollen cinereous yellow, yellow on the front; mesonotum strongly quadrivittate; abdominal segments with about the apical half bare. Length, 5.5 mm. Genotype:—C. lateralis, n. sp. (Panama).

Canalia, new genus

Female.—Front rather narrow; two pairs of orbitals; ocellars long; outer verticals strong; cheeks very narrow; face gently reeding, the oral margin slightly produced; ridges bare; proboscis short; palpi very slightly clavate; antennæ reaching almost to the vibrissæ, the second segment short; arista short plumose. Acrosticals 2-1; dorsocentrals 2-3; posterior sublateral and posthumeral bristle absent; two sternopleurals; infrasquamal setulae present; prosternum haired. Wings tinged with brown, especially toward the apex; apical cell ending a little in front of the wing-tip; third vein bristled to the anterior crossvein. Abdomen elongate oval, without discals, the first segment without marginals.
Black, the antennae, coxae and base of the abdomen on the broad sides, yellow; apex of abdomen red; pollen of the head white, of the mesonotum cinereous yellow, a broad brown fascia immediately behind the suture; abdominal segments narrowly white pollinose basally. Length, 7 mm. Genotype:—C. fasciata, n. sp. (Panama).

Schwarzalia, new genus

Female.—Arista long plumose; parafacials with short, fine hair; front of moderate width, with two pairs of orbitals; ocellars long; outer verticals weak; cheeks wide; face retreating, the oral margin produced; ridges bare; proboscis short; palpi scarcely elavate; antennae practically reaching the oral margin. Acrosticals weak, 3-1; dorsocentrals 2-3; posterior sublateral and posthumeral bristle absent; two sternopleurals; prosternum bare; infrasquamal setulae present. Apical cell ending a little before the wing-tip; third vein bristled half way to the anterior crossvein; first vein bristled on whole length. Abdomen elongate oval, without discals, the first segment without marginals. Black, the palpi, coxae, femora mostly, humeri and basal half, or less, of the abdomen yellowish-red; head and the broad bases of the abdominal segments white pollinose; thorax cinereous pollinose, mesonotum with a broad black band behind the suture. Length, 7.5 mm. Genotype:—S. luteipennis, n. sp. (Panama).

Tachinalia, new genus

Female.—Robust, the abdomen broader than the thorax and not much longer than wide. Eyes with long hair; parafacials haired; front rather narrow, with two pairs of orbitals; ocellars long, outer verticals absent; cheeks wide; face retreating, the oral margin produced; ridges bare; proboscis short; palpi slightly elavate; antennae reaching the lowest fifth of the face; arista bare. Acrosticals 2-3; dorsocentrals 3-3; posterior sublateral absent; posthumeral present; sternopleurals 2-1; prosternum bare; scutellum with many spinose bristles. Apical cell ending moderately before the wing-tip; third vein bristled basally. Abdomen almost wholly covered with spinose bristles. Head with cinereous pollen, thorax thinly pollinose; scutellum reddish, abdomen castaneous. Length, 10 to 11 mm. Genotype:—T. hispida, n. sp. (California).
Coloradalia, new genus

Male.—Front wide, the frontals not strong; ocellars long, reclinate; cheeks one-third as wide as eye-height; face strongly retreating, the ridges bristled on almost their whole length; middle of face deeply sunken, the oral margin not produced; antennæ almost as long as the face, the second segment short; proboscis short, palpi clavate; eyes with short hair. Acrosticals and dorsocentrals 3-3, the acrosticals not strong; posterior sublateral weak, the posthumeral hair-like; two sternopleurals; prothorax concealed. Apical cell ending a little before the wing-tip; third vein with two basal bristles, one of them long; first vein bristled on its whole length. Abdomen elongate oval, very deep, the genitalia large, but normally mostly concealed; discals and marginals on segments two to four. Black, cinereous pollinose; the mesonotum and front with yellowish tinge; apices of segments less thickly pollinose. Length, 5 mm. Genotype:—C. ocellaris, n. sp. (Colorado).

Lasionalia, new genus

Male.—Related to Townsendina, n. g., but the apical cell is closed, the posterior sublateral present, etc. Eyes bare; front narrow, widening anteriorly; ocellars long; outer verticals not developed; cheeks almost half as wide as the eye-height; parafacials with a complete row of bristly hairs and a second partial row on the upper half; ridges bare; face strongly retreating, the oral margin scarcely produced; proboscis short, the palpi slightly clavate; antennæ not reaching to the vibrissæ, the second segment somewhat shorter than the third; arista bare. Acrosticals and dorsocentrals 2-3; posterior sublateral present, the posthumeral absent; two sternopleurals; prothorax bare. Apical cell ending a little before the wing-tip, very short petiolate; third vein with one or two basal bristles. Abdomen elongate-oval, each segment with discals and marginals. Black, yellowish cinereous pollinose; palpi yellow; tibiae rather reddish. Length, 5.5 mm. Genotype:—L. cinerea, n. sp. (Minnesota).

Oxynopsalia, new genus

Female.—Front of moderate width; two pairs of orbitalis; ocellars long; outer verticals well developed; cheeks narrow; face strongly receding, the oral margin not produced; ridges bristled on more than the lower half; proboscis short; palpi clavate; antennæ reaching to the oral margin, the second segment somewhat elongate; arista bare. Eyes short
NORTH AMERICAN DIPTERA

pilose. Acrosticals and dorsoceentrals 3-3, the posterior presutural acro-
sticals situated close to the suture; posterior sublateral and posthumeral
bristle present; two sternopleurals; prosternum bare, narrow. Apical cell
ending close to the wing-tip; third vein with three bristles basally. Abdomen
elongate oval, each segment with marginals, the second and
third with discals; ovipositor simple. Black, the head and thorax ciner-
eous pollinose, the mesonotum mostly brownish; bases of abdominal seg-
ments very narrowly white pollinose. Length, 4.5 mm. Genotype:—
O. nitida, n. sp. (Panama).

Anadiscalia, new genus

Male and female.—Head twice as high as long; front narrow,
female with two pairs of orbitals; ocellars long; outer verticals weak;
cheeks and parafacials extremely narrow; face retreating but slightly;
oral margin not prominent, the ridges bare; proboscis short, the palpi
clavate; antennae reaching almost to the oral margin, the second segment
short; arista bare; eyes short haired. Acrosticals and dorsoceentrals 3-3;
posthumeral and posterior sublateral present; two sternopleurals;
prosternum haired. Apical cell ending moderately before the wing-tip;
third vein with two bristles basally. Abdomen oval, not deep. Black,
cinerous pollinose; palpi, humeri and abdomen reddish yellow, the ab-
domen with a more or less distinct median vitta, the apices of the seg-
ments more or less, and the fourth segment almost entirely black. All
segments with marginals but without discals. Length, 6 to 7 mm. Geno-
type:—A. basalis, n. sp. (Panama).

Zuanalia, new genus

Female.—Arista long plumose; front wide, with two pairs of orbit-
tals; ocellars long; outer verticals moderately strong; cheeks almost
half as wide as eye-height; parafacials bare; face strongly retreating on
upper part, the oral margin slightly produced; proboscis short; palpi
clavate, antennae reaching almost to the oral margin. Acrosticals 3-1,
the presuturals very weak; dorsoceentrals 3-4; posterior sublateral absent;
posthumeral present; sternopleurals 2-1; prosternum bare. Apical cell
ending a little before the wing-tip; bend of fourth vein with appendage;
base of third vein with about four bristles. Abdomen short oval, rather
deep. Head, thorax and legs reddish in ground color; head yellow
pollinose; mesonotum metallic blue, cinereous pollinose, trivittate; abdo-
men wholly metallic blue, the bases of the segments cinereous pollinose.
Length, 10 mm. Genotype:—Z. azurea, n. sp. (Panama).
Patillalia, new genus

Female.—Front of moderate width; two pairs of orbitals; ocellars long; outer verticals strong; cheeks narrow; face reeding, the oral margin not produced; probosceis short; palpi clavate; antennae reaching almost to the vibrissae; arista very short pubescent. Dorsocecntrals and acrosticals 3-3; posthumeral and posterior sublateral present; two sternopleurals; prosternum haired. Apical cell ending a little before the wing-tip; third vein with two strong basal bristles. Abdomen oval; all segments with marginals, the fourth with discals. Black; head white pollinose; the front yellowish above; thorax with white pollen on the sides, yellowish above, distinctly vittate; abdomen with very broad cinereous bands on the bases of the segments. Length, 7 mm. Genotype:—P. fasciata, n. sp. (Panama).

Agrarialia, new genus

Male.—Front wide, only a little narrower than the face; two pairs of strong orbitals; ocellars long; outer verticals strong; cheeks very narrow; face retreating, the oral margin scarcely produced; ridges bare; probosceis short; palpi clavate, hairy; antennae reaching practically to the oral margin, the second segment short, arista very short pubescent. Acrosticals 3-3, dorsocecntrals 3-4; posthumeral and posterior sublateral present; sternopleurals 2-1; prosternum haired. Apical cell ending well before the wing-tip; third vein bristled almost to the anterior crossvein. Abdomen elongate oval, somewhat tapering; each segment with marginals, but no discals; third segment with large sexual patch below. Black, cinereous pollinose, the head largely silvery; mesonotum with yellowish tinge, strongly vittate; apical third of abdominal segments shining black. Length, 7.5 mm. Genotype:—A. sexualis, n. sp. (Panama).

Aridalia, new genus

Female.—Front about as wide as the face; two pairs of orbitals; ocellars rather short and weak; outer verticals well developed; cheeks very narrow; face reeding, the ridges bare, the oral margin not produced; probosceis short; palpi weakly clavate; antennae reaching to the oral margin; arista short pubescent. Acrosticals 3-3; dorsocecntrals 3-4; posthumeral and posterior sublateral present; sternopleurals 2-1. Apical cell ending well before the wing-tip; third vein bristled to the anterior crossvein. Abdomen elongate oval, tapering apically; each
segment with marginals but without discals. Black with cinereous pollen; palpi yellow; sides of the abdomen broadly reddish on the basal half, the apex also reddish; pollen of front rather golden, of mesonotum more or less ochreous and strongly vittate; apices of abdominal segments broadly bare. Length 8 mm. Genotype:—A. lateralis, n. sp. (Panama).

Shermanalia, new genus

Male.—Arista long plumose; front moderately narrow; ocellars long; outer verticals absent; cheeks one-third as wide as eye-height; face scarcely retreating, the oral margin prominent, the ridges bare; apical section of the proboscis as long as the head-height; palpi somewhat clavate; antennæ not reaching to the oral margin, the second segment short. Acrosticals 1-1, the anterior pair weak; dorsoceentrals 2-3; posthumeral and posterior sublateral absent; sternopleurals 2-1; prosternum bare. Apical cell almost closed a little before the wing-tip; third vein with two weak bristles basally. Abdomen elongate, more than twice as long as wide, rather cylindrical, all the segments with marginals but without discals. Black, clothed with thick yellowish pollen; mesonotum with three black vitæ, the median one wide; first abdominal segment with an hourglass-shaped black spot, the base black, the following segments broadly black apically, the black expanding triangularly just below the sides. Length, 6 mm. Genotype:—S. pretiosa, n. sp. (Panama).

Prorhynchops errans Curran (fig. 172) traces to this genus but the arista rays arise from only the upper and lower surfaces. It is probably not a Prorhynchops as it lacks discal bristles.

Thealaria, new genus

Male.—Front rather wide, with a single pair of strong orbitals; ocellars short and hair-like; outer verticals distinct; cheeks narrow; face receding, the oral margin not produced; proboscis short; palpi weakly clavate; antennæ not reaching to the oral margin; arista very short plumose. Acrosticals 3-3; dorsoceentrals 2-3; posterior sublateral poorly developed, the posthumeral absent; sternopleurals 1-1; prosternum haired. Apical cell ending moderately before the wing-tip; third vein bristled more than half way to the anterior crossvein. Abdomen tapering, each segment with marginals, only the fourth with discals. Black, yellow pollinose: mesonotum with four vitæ which unite to form
a broad postsutural fascia; first abdominal segment wholly, the others on the apical half, shining. Length, 8 mm. Genotype:—*T. fasciata*, n. sp. (Panama).

**Microtownersendia, new genus**

Female.—Front as wide as the face; two pairs of orbitals; ocellars moderately strong; outer verticals strong; cheeks extremely narrow; face receding, the ridges bare; oral margin not produced; proboscis short; palpi clavate; antennae reaching the oral margin, the second segment short; arista bare. Acrosticals and dorsoceentrals 2-3; posthumeral and posterior sublateral present; two sternopleurals; prosternum haired. Apical cell ending a little before the wing-tip; third vein with two basal bristles. Abdomen oval, the fourth segment elongate; discals absent, each segment with marginals. Black, with cinereous white pollen; mesonotum thinly pollinose and weakly vittate; bases of abdominal segments narrowly pollinose; palpi yellow. Length, 3.75 mm. Genotype:—*M. nitens*, n. sp. (Panama).
Family Braulidæ—The Honey-bee Parasite

This family is comprised of a single species of *Braula*, parasitic upon honey bees.

Scutellum absent, the mesonotum not differentiated from the abdominal segments, the abdomen sessile; eyes minute; ocelli absent; antennæ set in lateral grooves; vertex without bristles. Fifth tarsal segment broad and bearing an inflexed comb of many microscopic teeth. Wings entirely absent.

The Braulidæ are not larviparous, but lay eggs.

*Braula ceca* Nitzsch is a small convex insect found only in the hives of honey bees. It is said to be cosmopolitan in distribution but is rare in this country, at least in collections.
Family Hippoboscidae—The Bird Parasite Flies

Olfersia sordida.

Small, flat flies of leathery consistency, usually with wings, the posterior veins weaker.

Head flattened, usually attached to an emargination of the thorax. Face short; palpi forming a sheath for the proboscis, projecting in front of the head; antennae inserted in pits or depressions near the border of the mouth, apparently with a single segment, with or without a terminal bristle or hairs. Eyes round or oval; ocelli present or absent. Thorax flattened; scutellum short and broad. Halteres present or rudimentary, rarely absent. Abdomen sac-like, the sutures indistinct, the basal segments usually fully chitinized. Legs short and strong, broadly separated by the sternum; tarsi short; claws strong and often with one or two teeth. Wings present or absent, the veins approximated to the anterior border, with weak ones running obliquely across the posterior two-thirds of the wing. Larviparous.
The adults occur on birds and mammals. They are most frequently found on birds, seldom flying. In the old world species of Hippobosca are found on horses, camels, etc. and often occur in large numbers, as is the case with the sheep tick, a wingless species occurring wherever sheep are raised.

Hippoboscidae.—1, Stilbometopa impressa; 2, Pseudolynchia maura; 3, Lynchia americana; 4, Ornithoica; 5, 6, Ornithomyia; 7, Ornithoctona erythrocephala.
Aldrich* has published a key to the genera but the species are very difficult to determine, there are no keys to the American species, and although most of them have been figured, the illustrations and descriptions are scattered.

**KEY TO GENERA†**

1. With functional wings, longer than abdomen ........................................ 2
   Wings rudimentary, broken off or absent ........................................ 12
2. Wing with five or six distinct veins behind the costa ................................ 3
   Wing with only three distinct veins behind the costa, the first, third and fifth ............................................. *Lipoptena* Nitzsch
3. Anal cell closed by a crossvein (4) ........................................ 4
   Anal cell open apically (2) ........................................ 9
4. Ocelli present ........................................ 6
   Ocelli absent ........................................ 5
5. Claws bidentate; head rounded behind and free from thorax (not naturalized in America) ........................................ *Hippobosca* Linnaeus
   Claws tridentate; head truncate behind, in a deep emargination of the thorax (1) ............................................. *Stilbometopa* Coquillett
6. Third vein joining the tip of the costal vein at a distinct angle; claws tridentate ........................................ 7
   Third vein confluent with the costal vein on the apical third; claws bidentate (4) ............................................. *Ornithoica* Rondani
7. Antennal processes two-thirds as long as the head, straight and parallel with each other, broadly rounded at tip ............................................. *Ornithopertha* Speiser
   Antennal processes much shorter, more or less pointed ........................................ 8
8. Antennal processes broad, concave above, with projecting outer rim, curved inwardly so as to almost or quite touch each other (7).
   *Ornithoctona* Speiser
   Antennal processes narrow, without outer rim, divergent and curving downward (5, 6) ............................................. *Ornithomyia* Latreille
9. Crossvein closing the second basal cell entirely absent (2) ........................................ 11
   Crossvein closing the second basal cell at least half present (3) ........................................ 10
10. Lateral lobe of the metanotum swollen and bearing a mammiform process; fourth vein setulose (see text figure) ............................................. *Olferia* Wiedemann
    Lateral lobe of metanotum less swollen and without processes; fourth vein bare (3) ............................................. *Lynchia* Weyenbergh
11. Ocelli entirely absent; scutellum angulate laterally (2).
    *Pseudolynchia* Bequaert
    Ocelli occasionally present but minute; scutellum convex posteriorly.
    *Microlynchia* Lutz, Neiva and Costa Lima
12. Halteres present ........................................ 13
    Halteres absent; wings aborted, reduced to short knobs.
    *Melophagus* Latreille
13. Ocelli present, claws bidentate; with basal stumps of broken wings.
    *Lipoptena* Nitzsch
    Ocelli absent, claws tridentate; wings present, much shorter than the abdomen. (*Brachypteromyia* Williston) ............................................. *Myophthiria* Rondani

† Checked by Dr. J. Bequaert.
Family Nycteribiidae

Small, spider-like, wingless flies.

Head oval, folding back when at rest in a groove on the dorsum of the thorax. Antennae short, two segmented, the oval terminal segment with bristles, inserted in cavity; eyes and ocelli vestigial. Thorax depressed, laterally and anteriorly with comb-like bristles. Abdomen oval, with more or less distinct segmentation. Legs long, the knees at rest prominent above the thorax; femora broad; tibiae clubbed or shovel-shaped; basal tarsal segment very long. Halteres pendunculate or sessile, often indistinct. Larviparous.

The members of this family are all parasitic upon bats and occur throughout the tropics and subtropics but are most numerous in the Old World.

Ferris* considers that we have but one genus in North America and perhaps two genera in the western hemisphere. *Nycteribia* possibly occurs in Brazil but there are no positive records from other parts of the continent. The two genera are separable as follows:

1. Eyes absent ............................................. *Nycteribia* Latreille
   Eyes present, two-facetted .......................... *Basilia* Ribeiro

Family Streblidæ—The Bat Flies

Head of moderate size, with a freely movable neck. Eyes, when present, small, without or with very few facets; ocelli absent. Antennae inserted in a pit, two segmented, the second segment with a bristle. Proboscis short, not protrusible, thickened basally; palpi broader than long, projecting leaf-like in front of the head, not forming a sheath for the proboscis. Abdomen with a distinct basal segment, the other segments rarely distinguishable, the basal segment with special bristles for the protection of the wings when at rest. Posterior coxae always enlarged; fifth segment of the tarsi usually elongate and enlarged; pulvilli present, the claws never toothed. Wings sometimes vestigial or wanting, when present the veins stout and covered with hairs. Halteres present.

All but one species are parasitic upon bats but they are restricted to the tropics and the subtropico-temperate zones. Kessel* has reviewed the family.

KEY TO GENERA †

1. With a ctenidium of black bristles on the ventral surface of the head.  2
   Without a ctenidium on under surface of head .........................  4

2. Eyes present; wings well-developed, with six veins (1) ..................  3
   Eyes absent; wings reduced to oval pads, much shorter than the thorax.
   Metelasmus Coquillett

† Checked by Dr. J. Bequaert.
3. Ctenidium extending to the sides of the head and visible laterally from
dorsal view ........................................ 3a
Ctenidium ending far before the sides of the head (E. breviceps,
Panama) ........................................ Elduninia, n. g.

3a. Posterior femora about twice as long as the anterior ones; anterior
cross-vein before the middle of the wing (1) ........... Strebla Wiedemann
Posterior femora decidedly less than twice as long as the anterior ones;
anterior crossvein beyond the middle of the wing (2).

Euctenodes Waterhouse

4. Wings entirely lacking ........................................ 5
Wings present, though small ........................................ 6

5. Posterior legs about twice as long as the anterior ones.

Megistopoda Macquart
Posterior legs not twice as long as the anterior ones.

Paradyschiria Speiser

6. Wings of normal size ........................................ 8
Wings small, narrow or short ........................................ 7

7. Wings erect and narrow; posterior legs about twice as long as anterior
ones (5, also text figure) .................................... Pterellipsis Coquillett
Wings lying flat, short; posterior legs not twice as long as anterior
ones (4) ........................................ Aspidoptera Coquillett

8. Wings with a single crossvein and three longitudinal veins; thorax com-
pressed (3) ........................................ Nycterophilia Ferris
Wings with at least two crossveins and six longitudinal veins; thorax
depressed ........................................ 9

9. Posterior legs at least twice as long as the anterior pair ............... 10
Posterior legs obviously less than twice as long as the anterior pair
(6) ........................................ Trichobius Gervais

10. Posterior legs three times as long as the body ....................................... Paratrichobius Costa Lima
Posterior legs about twice as long as the front pair .............. Speiseria Kessel

6, Trichobius sparsus.
GLOSSARY OF TERMS USED IN DIPTEROLOGY

Abdomen—The hindermost of the three main body divisions.
Acalypterae—The Acalypterate Muscoidea—those with very small or linear squamae.
Acrostral bristles—The rows of mesonotal bristles between the dorsocentrals—the two median rows of bristles of the thorax.
Acrostral hairs—Hairs lying between the dorsocentral bristles.
Acrostral setulae—Very short hairs between the dorsocentral bristles.
Adventitious veins—Veins occurring in abnormal positions, sometimes rather regularly placed, and sometimes normally present.
Ædeagus—Part of the male negitalia: the penis and its sheath.
Alate—Having wings.
Alula—A lobe at the base of the wing posteriorly.

Anal cell—The cell lying between the fifth and sixth veins (Cu).
Anal crossvein—The crossvein closing the anal cell apically—(Cu;) of Comstock-Needham.
Anal lobe—The basal part of the wing behind the anal vein.
Anal vein—The sixth longitudinal vein. The second anal is usually absent or represented by a fold.
Anepisternite—The mesopleura.
Annulate—Having rings, but not completely segmented.
Annulus—A ring or band.
Antennae—The feelers, attached to the head and separating the face and the front. They are sensory organs and perhaps combine the senses of smell and hearing.
Antennal fovea—See antennal grooves.
Antennal grooves—Definite depressions in the middle of the face in which the antennæ may rest. They are limited laterally by the facial ridges and in the middle, unless they are united, by a carina.
Anterior crossvein—The short crossvein connecting the third and fourth longitudinal veins on the basal half of the wing—(r-m).

Examples of mimetic resemblances in flies.

Apical—Toward the apex.
Apical cell—The first posterior cell—the space between the third and fourth longitudinal vein beyond the anterior crossvein (R.).
Apical scutellars—The apical pair of marginal bristles on the scutellum. The term is loosely applied and often means the sub-apical scutellars, in cases where the true apicals are absent.
Apical spurs (of tibia)—Short, rather stout bristles often present on the under or ventral surface of the tibiae. The number varies, and may differ on different pairs of legs.
Appendage (vein)—The presence of a short vein at the angle of a bend.
Apterous—Wingless.
Arcuate—Arched like a bow.
Arista—A bristle-like portion of the third antennal segment which may be apical or dorsal and sub-basal. It is composed normally of three segments; the first is usually minute and the second short, although all three may be elongate.
Auxiliary vein—The subcostal vein; that vein lying between the costa and first vein, often absent. (Subcostal; mediastinal.)
Axillary cell—The area behind the anal vein.
Axillary lobe—The area behind the anal vein. See axillary cell.
Axillary vein—The second anal vein when this is present (2nd A).
Basad—Toward the base.
Basicosta—The second distinct “scale” at the base of the wing in Muscoids. It is bare. The basal “scale” is the epaulet and is haired.
Basitarsus (si)—A term applied to the basa! segment of the tarsi.
Bend of fourth vein—The curve of the fourth vein beyond the posterior cross-vein (Muscoids).
Bilobed—Divided or split into two parts.
Calcari—A single posterodorsal bristle usually strong, situated on the posterior tibiae at or beyond the middle (Muscidae).
Calypter (Calypters, Calypterae)—See squamae.
Calypterae—See Calyptertae.
Calyptertae—The Calypterate Muscoidae—Tachinidae, Metopiidae, Muscidae, Oestrada and Cuterebridae.
Capitate—Enlarged at the apex.
Carinate—Ridged or bearing a raised line or keel.
Caudal—Toward the posterior end of the abdomen or hind margin of the wing.
Caudal—Pertaining to the apex of the abdomen.
Cephalad—Toward the front of the head.
Cell—A space in the wing bounded by veins.
Cheeks—The space below the eyes. Sometimes termed the peristoma.
Chitinized—Hardened or horn-like; not membranous. There has been a great deal of discussion as to the proper use of the term chitin. As generally, and I think properly, used it refers to the leather-like, or hard part of insects; now commonly written sclerotized.
Clavate—Clubbed or enlarged at the apex.
Claws—Tarsal claws, borne on the fifth (or apical) tarsal segment.
Clypeus—A distinct sclerite at the base of the proboscis adjacent to the anterior oral opening. Some authors have contended that the clypeus is absent and that the middle of the face is the true clypeus. This seems very doubtful and I do not accept the contention. The term has been applied recently to the middle of the face, but epistoma is a much better term for that part.
Coarctate—Narrowed between the base and apex at some point.
Comb—A row of closely set, short bristles. (Often occurring on the femora or tarsi: Drosophilidae, etc.)
Anisopus
(Anisopodidae)

Thereva
(Therevidae)

Pantarbes
(Bombyliidae)

Conops
(Conopidae)

Scenopinus
(Scenopinidae)

Rhamphomyia
(Empidae)

THE VEINS AND CELLS, COMSTOCK-NEEDHAM SYSTEM
COMSTOCK-NEEDHAM SYSTEM OF WING VENATION.

The comparison of the system here used is with that of Comstock-Needham, not as revised by Tillyard and others.

Anal cell—Cu.
Anal crossvein—Cu.
Crossveins—h; r-m; m; M3; Cu; Sc.
Discal cell—1st M3.
Discoidal crossvein—M3.
Fifth longitudinal—Cu1, 2.
First basal cell—R.
First vein—R plus Rn. (the main stem of the vein, basad of Rs, is R, — beyond Rs, Rn).
Large crossvein—m and outer section of M3.
Marginal cell—Rn.
Posterior cells—R3 to Cu.
Posterior crossvein—m, and sometimes also outer section of M3.
Prefurca—Rs.
Second vein—Rs, and its anterior branch, R2, 3.
Small crossvein—r-m.
Subcostal crossvein—Sc.
Submarginal cells—Rs, Rn.
Third longvein—Posterior branch of Rs, —Rn.
Compressed—Flattened from side to side—laterally compressed.
Connate—Fused and immovable.
Constricted—Narrowed.
Conspicuous—Horn-like in texture or appearing so.
Costa—See costal vein.
Costal cell—The cell between the costa and subcostal or auxiliary vein.
Costal vein—The vein extending along the front margin of the wing.
Crossveins—There are five typical crossveins in the wings: humeral, anterior, posterior, discoidal and anal (The equivalents of these in the Comstock-Needham system are, in order,—h; r-m; m; M3 and Cu). In addition to these there is the subcostal crossvein (Sc), and there may be one or more veins simulating crossveins. The apical crossvein is merely the anteriorly curved fourth longitudinal vein (Muscoidea). The base of the third vein, base of posterior branch of the fourth vein and the base of the branches of the fifth vein may simulate crossveins. In some families there may be additional crossveins (see Nemestrinidae, Bombyliidae, etc.).
Cruciate—Crossing each other.
Ctenidium—A comb-like row of bristles.
Cubitus—Fifth longitudinal vein.
Decumbent—Depressed; hanging down.
Decussate—Crossing or cruciate.
Depressed—Flattened dorsoventrally, contrasting with compressed.
Dichoptic—Eyes separated by the front.
Digitate—Bearing a finger-like process.
Discal cell—A (usually) closed cell (on the disc of the wing, lying between the fourth and fifth veins). It may be absent, open apically, or united with one of the basal cells, usually the second basal, abnormally with the first basal (1st M3).
Discal crossvein—The vein separating the discal and second basal cells. (See discoidal crossvein.) (M3 of Comstock-Needham system).
Discal scutellars—Bristles on the disc of the scutellum.
Discoidal crossvein—The vein separating the discal and second basal cells. (See discal crossvein.) (M3 of Comstock-Needham system).
Dorsad—Toward the upper surface.
WING OF TABANUS

The terminology of the veins and parts shown on this figure is that used in the present work, except in the Tipuloidea.

WING OF SILVIUS


WING OF PANGONIA

Schiner's system. Cells. 1, costal; 2, mediastinal; 3, subcostal; 4, 5, cubital; 6, 7, 8, 9, 11, first to fifth posterior cells; 12, discoidal cell; 13, 14, 15, first to third basal cells; 16, axillary cell.
GLOSSARY OF TERMS USED IN DIPTEROLOGY

Dorsal—Pertaining to the upper surface of the body.
Dorsocentrals—Dorsocentral bristles of the thorax.
Dorsopleural suture—See notopleural suture.
Dorsum—Upper surface. Refers to thorax and abdomen.
Epaulet—The first "scale" at the base of the costa. It is haired and is followed by a bare "scale", the basicosta.
Empodium (in)—A bristle, hair or pad borne on the apical tarsal segment between the pulvilli.
Epiphysis—A lappet-like process or lobe.
Epistoma—Correctly, the anterior oral margin. Frequently used to denote the facial depression or middle of the face from the oral margin to the antennae.
Eyes—The compound eyes, composed of, usually, many facets.
Face—The front of the head between the mouth and the antennae.
Facets—The divisions comprising the compound eyes.
Facial depression—The middle of the face. Facial plate.
Facial plate—The central part of the face.
Femur (femora)—The long part of the leg nearest the thorax, but separated from the thorax by the coxa and trochanter. The thigh.
Fifth longitudinal vein—The vein running along the posterior side of the second basal cell, and of the discal cell, usually two-branched, the second branch separating the fourth and fifth posterior cells. (Cu₂, 2; postical.)
First basal cell—A cell lying between the first, second and third and the fourth longitudinal veins on the basal half of the wing.
First vein—The vein lying immediately behind the auxiliary vein, or when that is absent, immediately behind the costa. (R and R.)
Flagellum—In flies having six or more antennal segments the portion beyond the scape.
Fourth longitudinal vein—The vein, usually arising near the base of the wing, separating the two basal cells and bordering the discal cell anteriorly, often branched, the posterior branch often partly closing the discal cell. (Medial, M₁, 2; discoidal.)
Front—The space between the eyes lying above the antennae and limited by the vertex or top of the head.
Frontalia—The central stripe of the front. Frontal vitta.
Frontal lunule—The space between the bases of the antennae and the ptininal or frontal suture, actually occurring only in Cyclorrhaphous flies, but the term, or "lunula", is loosely applied to some other flies.
Frontal orbits—The space contiguous to the eyes on the front.
Frontals or frontal bristles—Bristles situated along the inner edge of the parafrontals.
Frontal triangle—The triangle in holoptic flies bounded above by the eyes and below by the antennae.
Frontal vitta—The softer area between the rows of frontal bristles or hairs extending from the antennæ to the ocelli. This allows the head to expand laterally in Cyclorrhaphous Diptera when the ptinum is expanded.
Fronto-orbital bristles—The orbitalis or orbital bristles. The term is variously used and is often applied to the frontals in the Acypterata.
Gena (mæ)—The cheek. Often refers to the parafacials. The term is best avoided.
Geniculate—Abruptly bent or elbowed.
Genitalia—The external sexual organs together with the adjacent parts.
Gibbous—Puffed out; hunch-backed.
Glabrous—Without hairs; smooth.
Halteres—Appendages arising on the posterior of the pleura, with a long stem and apical knob. These occur in practically all Diptera, rarely being
reduced to slight swellings in some apterous forms. They are supposed to be the rudiments of the second pair of wings but I doubt this. The removal of the halteres renders the insects unable to fly.

Holoptic—Eyes contiguous, dividing the front into an upper and lower part.

Humeral crossvein—A crossvein situated near the base of the wing and extending from the costa to the auxiliary or subcostal vein and continuing to the first vein.

Humeri—The anterior corners of the mesonotum usually more or less well marked.

Hyaline—Transparent.

Hypopleura—The space below the posterior spiracle and above the posterior coxae.

Hypopleural bristles—Bristles on the hypopleura, usually in a vertical row.

Hypopygium—The male genitalia together with the adjacent parts. It is composed of several of the apical abdominal segments and is variously modified.

Infra-squamal setulæ—Fine hairs below the point of attachment of the squamae.

Intercalary vein—A term sometimes applied to the posterior branch of the fourth vein in cases where its base partly closes the discal cell (M2).

Interfrontal (bristles or hairs)—Hairs or bristles on the frontal vitta.

Interfrontalia—The frontal vitta.

Intra-alar bristles—Bristles situated behind the suture and between the supra-alar and dorso-central bristles.

Jowls—The cheeks, behind the depressed anterior part. Sometimes termed the peristoma.

Labellæ—The lips of the proboscis. Supposed to be the modified labial palpi. Sometimes broadly expanded, at other times much reduced or apparently lacking.

Lamella (e)—A leaf-like plate.

Lamellate—Broadened and flat; leaf-like; bearing lamellæ.

Large crossvein—The crossvein closing the discal cell; posterior crossvein (M and M3).

Lateral—At, toward, or pertaining to the sides of the body.

Lunula—A term applied to the more or less crescentric area above the antennæ in some flies, notably in the Syrphidæ. Also a lunulate marking.

Lunule—See lunula.
Macrotrichia—The larger microscopic hairs on the surface of the wings.
Marginal cell—The cell lying between the first and second longitudinal veins (R).  
Marginal scutellars—Bristles situated close to or on the margin of the scutellum.
Media—The fourth longitudinal vein.
Medial—Pertaining to the media or middle.
Median—Along the middle.
Mesad—Toward the middle.

**MESONOTAL BRISTLES**

a, acrosticals; as, apical scutellars; dc, dorsocentrals; hm, humeral; ia, intra-alar; ls, lateral or basal scutellars; ms, marginal scutellars; npl, notopleural; pa, postalar; pr, presutural; sa, supra-alar; sc, scutellars; sl, sublaterals.

Mesonotum—The dorsum of the mesothorax or the main part of the back. Sometimes termed the mesoscutum. According to morphological usage the divisions of the mesonotum are, from front to rear, prescutum, scutum, scutellum and postscutellum.*

Mesopleura—A so-called pleurite or sclerite of the pleura bounded above by the mesonotum, in front by the propleura, below by a more or less distinct suture and behind by a suture extending down from in front of the wings. The so-called suture separating the mesopleura and sternopleura is merely a fold leaving an exterior furrow.

Mesoscutum—See mesonotum.
Mesosternum—The under side of the mesothorax.
Mesothorax—The second and largest segment of the thorax. The wings and second pair of legs arise from this segment.
Metacephalon—The area behind the mouth extending up toward the neck.
Metanotal slopes—Swellings on the sides of the metanotum or its sloping sides (pleurotergite).

*While not professing any great knowledge of morphology I am far from being convinced that the Metanotum, as used by taxonomists, is actually part of the Mesonotum: there is a distinct, membranous suture between this part and the scutellum, such as one expects to find between true sclerites.
Metanotum—The dorsum of the metathorax, lying behind the scutellum. (*According to recent morphological usage this is the postnotum or postscutellum and is part of the mesonotum: the true metanotum is found only in the lower Diptera, as Psychodidae.) See footnote, p. 487.
Metapleura—The part of the metathorax above the hypopleura and outside of the metanotum. It is a poorly defined area and not really separable from the metanotum.
Metasternum—The under side of the metathorax, situated behind the middle coxae and extending to behind the posterior coxae.
Metatarsus (si)—A term applied to the basal segment of the tarsi.
Metathorax—The third segment of the thorax. The posterior legs and halteres arise from this segment.
Micropterous—With small or vestigial wings.
Microtrichia—The smaller abundant hairs of the wing. When these are present the wing is said to be villous.
Moniliform—Resembling a string of beads.
Neuration—The arrangement of the veins of the wing.
Node—A swelling or knot-like knob.
Notopleura—A depression, more or less triangular, situated immediately before the transverse suture and behind the humeri.
Notopleural suture—The suture extending from the humeri to the base of the wings.
Notum—The dorsal surface; particularly of the thorax.
Ocellar bristles—Bristles arising within the ocellar triangle or on either side of the anterior ocellus.
Ocellar triangle—The triangle formed by the ocelli or the triangular, well-marked area surrounding them. This triangle has sometimes been termed the frontal triangle in cases where it extends almost to the antennal base.
Ocellar tubercle—A term applied to the swelling on which the ocelli are sometimes situated, especially in the Asilidae.
Ocelli—The simple eyes, located on the front, usually near the vertex.
Occipital cilia—The row of bristly hairs behind the eyes.
Occipital fringe—The fringe of fine hairs behind the eyes.
Occiput—The back of the head. Morphologically the subtriangular area limited by the vertex between the eyes and the neck.
Onychium (ia)—A pad between the tarsal claws.
Orbit—The part of the head immediately surrounding the eyes.
Orbital bristles—Bristles, usually proclinate or divergent, situated on the parafrontals between the frontals and orbits.
Ordinary crossvein—Anterior or small crossvein, r-m (Schiner).
Ovipositor—The female genitalia with the adjacent parts, composed of several segments and usually telescopic, but often variously modified.
Palpi—The maxillary palpi.
Parafacials, parafacialia—The part of the face between the facial ridges and the eyes.
Parafrontals—The part of the front outside the frontal bristles.
Pectinate—With branches like a comb.
Pectus—The under side of the thorax.
Pendulous—Hanging from one end.
Peristoma—Correctly, the region surrounding the mouth, but used in various senses. The part of the cheeks nearest the oral opening. The anterior oral opening. The anterior part of the cheeks. The term should be avoided as being too confusing.
Petiolate—Attached by a stalk or stem.
Phytophagous—Feeding on plants.
Pilose—Having long, fine hair, usually dense. The term is loosely applied to include any hair that is not coarse.

Pleurites—A term applied to the sclerites or sections of the pleura.

Pleurotergite—The hypopleura; morphologically the lateral division of the metanotum (postscutellum), at least in Nematocera.

Plumose—Having rays on both sides like a feather.

Pollen—A fine, dust-like substance on the integument.

Pollinose—Covered with "dust" or "bloom".

Posterior calli—The swellings at the posterior corners of the mesonotum, present in the Calypteratae, and other families, but absent in the Acalypteratae as a rule. (Posterior callosities).

Posterior cells—The cells on the apical part of the wing lying between the third and fifth veins, exclusive of the discal cells (R₃ to Cu₁). Some of these cells may be closed by the union of veins apically.

Posterior crossvein—The vein or veins closing the discal cell apically (m and M₃). According to Schiner the basal section of Cu₁ of the Comstock-Needham System.

Posterior orbits—The part of the head immediately behind the eyes.

Posthumeral bristle—A bristle situated behind the humerus.

Post ocellar(s) (bristles)—A pair (or more) of bristles arising just below the vertex on the occiput and behind the ocellar tubercle, sometimes termed post-verticals.

Postscutellum—A convex, transverse swelling below the scutellum; actually the upper, posteriorly produced section of the metanotum.

Postvertical(s) bristles—See post ocellars.

Præfurca—See præfurca.

Pra—Prealar bristle.

Præscutum—The part of the mesonotum in front of the transverse suture.

Prealar (bristle)—The anterior supra alar bristle. This is frequently absent or reduced. It is used particularly in Muscidae.

Prefurca—The petiole of the second and third longitudinal veins. Base of Rₛ₃ (The Radial sector Rs).

Preapical bristle (of tibia)—A dorsal, short bristle situated before the end of the tibia.

Prescutum—See præscutum.

Presutural bristle—A bristle situated in front of the inner end of the notopleura in front of the suture. The lateral bristle situated in front of but close to the suture.

**PLEURAL DIVISIONS OF SYRPHUS**

Hypo, hypopleura; Meso, mesopleura; Meta, metapleura; Pro, propleura; Ptero, pteropleura; Sterno, sternopleura.
Proboscis—The mouthparts exclusive of the palpi; always more or less tube-like. They may be slender and adapted for piercing, or thick and adapted for lapping.

Proclinate—Curving or directed forward.

Pronotum—The dorsum of the prothorax.

Propleura—The sides of the prothorax. This is usually a depressed area, but also includes the area above the front coxae.

Propleural bristle—A bristle situated on the propleura immediately above the front coxae.

Prosternum—The under side of the prothorax, between and in front of the anterior coxae.

Prothoracic bristle—A bristle situated immediately above the anterior coxae (See propleural bristle).

Prothorax—The first segment of the thorax. The first pair of legs arise from the prothorax.

Pruinose—Covered with a hoary dust. (See pollinose).

Pseudosutural foveae—Impressed polished areas on the humeral portion of the mesonotum (humeral pits); in Tipulidae and elsewhere.

Pteropleura—A sclerite lying below the base of the wings.

Pteropleural bristle(s)—Bristle or bristles on the pteropleura.

Pteropleurites—The upper and lower sections of the pteropleura.

Ptilinum—An inflatable sac, occurring in Cyclorrhaphous flies and pushed out above the antennae by the insect in emerging from the pupa (or puparium). This sac is coarsely grained or pubescent and when forced out thrusts the face into a horizontal position and when retracted after emergence leaves the frontal lunule exposed and is concealed in part beneath the facial ridges.

Pubescent—Having very short, fine hair.

Foot of house-fly, showing claws, pulvilli and the hair-like empodium.

Pulvilli—Pads borne on the apical segment of the tarsus between the claws.

Pulvilliform—Shaped like the pulvilli.

Punctate—Pitted; covered with small pits.

Puparium—The pupa when formed within the hardened larval skin.

Pupiparous—Giving birth to larvae ready to pupate.

Radial—Pertaining to the radius.

Radial cell—Any cell bordered in front by a branch of the radius.

Radius—The first to third longitudinal veins. R₁ to R₅ of Comstock-Needham system.

Raptorial—Fitted for grasping prey.

Reclinate—Curving or directed backward.

Recurrent—The anterior end nearer the base of the wing than some other part.

Reniform—Kidney-shaped.

Reticulate—Having a network.
Rostrum—The beak or snout.
Rugose—Wrinkled.
Rugulose—Finely wrinkled.
Scapa (of antennae)—The basal two segments in those flies having six or more antennal segments. These segments are differentiated from the remaining segments, although the first may be small and ring-like; the second segment is sometimes called the pedicel.
Sclerite—Any piece of the body well surrounded by sutures.
Scutellum—A (usually) convex sclerite attached to the back of the mesonotum. Sometimes termed the shield.
Scutum—The part of the mesonotum behind the transverse suture.
Second basal cell—A cell lying immediately behind the first basal, rarely united with it, more often open apically and united with the discal cell, but closed in most cases (Cell M).
Second vein—The vein (frequently absent), lying immediately behind the first vein, its base always united with the base of the third vein (Rs and its anterior branch R2+3).
Serrate—Toothed along the edge like a saw.
Sessile—Broadly attached; incapable of movement.
Seta—A bristle.
Setaceous—Bristle-like.
Setigerous tubercles—Tubercles, occurring on the scutellum or legs, each bearing a spine or bristle on its top.
Setula—Very short hairs, sometimes coarse.
Setules—Setulae.
Setulose—Bearing setulae.
Sinuous—S-shaped, winding back and forth.
Sixth longitudinal vein—The first anal vein. The second anal is usually absent or represented by a fold extending around the anterior apex of the alula. (Anal vein).
Small crosvein—The anterior crosvein (r-m).
Spatulate—Broadened apically, narrow basally.
Spiracles—The external openings of the tracheal system.
Spurs—Either movable spines at the end of the tibiae or strong production of apex of tibiae or a tapering production of some part of the body, usually on the legs.
Spurious vein—An extra, usually very weak vein crossing the anterior crossvein.
Squamae—The scales or connecting lobes connecting the wings basally with the thorax. There are two lobes, the upper and lower. The lower lobe is often greatly enlarged and is generally referred to as the squama.
Squamose—Scale-like. Refers particularly to scale-like hairs.
Sternites—Ventral sclerites or the under side of the segments.
Sternopleural bristles—Bristles situated on the upper part of the sternopleura on the posterior half.
Sternum—The under side of the thorax, comprising the pro-, meso- and meta sternum.
Stigma—A darkened and often thickened area lying immediately behind the costa, either beyond the tip of the first or second veins.
Stylate—Bearing a style.
Style—A thick, terminal portion of the antennae arising from the third segment, sometimes simulating segments, but usually tapering.
Stylose—Bearing a style.
Subantennal groove—See facial grooves.
Subcosta—The vein, usually present, between the costa and the first longitudinal vein.
Subcostal cell—The cell between the subcosta or auxiliary vein and the first vein or radius.
Subcostal crossvein—A crossvein, sometimes present, connecting the subcosta or auxiliary vein and the first vein. This is used taxonomically in the Mycetophilidae and the Tipuloidea (Morphologically sc). Subcostal vein—The vein lying between the costa and the first longitudinal vein. It is sometimes absent or greatly reduced.
Sublateral bristles—Bristles situated in a line with the intra-alars but in front of the suture. The anterior two are sometimes included as posthumerals but the term is deceptive.
Submarginal cell(s)—The cell or cells lying between the second and third longitudinal veins (Rs and R5). Sulcate—Grooved or furrowed.
Supernumerary cells—Additional cells occurring in the wings due to the presence of extra crossveins (See Nemestrinidae, Bombyliidae, etc.).
Supernumerary crossveins—Crossveins, other than those normally present.
Supra-alar bristles—Bristles close to the edge of the thorax behind the suture.
Suture—A line separating the parts of the body wall.
Tarsus (si)—The feet, composed normally of five segments. The apical segment bears the claws, pulvilli and empodium when these are not obsolete. In rare cases the number of tarsal segments is reduced to two. The tarsal segments are numbered from the base, segments one to five, although the first segment is sometimes termed the basitarus or metatarsus.
Tegulae—See Squamae.
Tergites—Dorsal sclerites or the upper side of the segment.
Third longitudinal vein—The vein arising jointly with the second vein and branching from it, sometimes branched. Behind it is the first posterior cell and behind or before its base, the first basal cell (R5; Posterior branch of Rs; Cubital).
Thorax—The middle part of the body bearing the wings and legs.
Tibia(e)—The part of the leg beyond the femur.
Transverse suture (of thorax)—The depressions extending inward from the sides of the mesonotum near the middle, but not true sutures. In the Muscoids this is said to be complete or extend entirely across, but this is not always the case. Usually the suture is obsolete in the middle. In the Tipulidae it is V-shaped. The suture divides the anterior series of bristles from the posterior dorsocentrals and acrosticals, whether it is complete or not.
Trichostical bristles—Hypopleurial bristles, used especially in the Asilidae.
Trochanter—The small, ring-like portion connecting the coxae and femora. This often appears more or less triangular as only part of it is generally visible.
Truncate—Ending transversely or with cut-off apex.
Tubercle—A conspicuous, more or less rounded swelling, sometimes elongate as on the face of Syrphidae, etc.
Tuberculate pits—Paired shiny dots at or near the anterior margin of the mesonotum, one on either side of the median line; in Tipulidae.
Ungues—Claws.
Veneration—The arrangement of the veins of the wings.
Venter—The under surface of the abdomen.
Ventrad—Toward the venter.
Ventral—Pertaining to the under side of the body.
Vertex—The uppermost edge of the front; usually that part between the ocelli and the back of the head, or behind and between the upper angles of the eyes.
Vertical triangle—The space, in holoptic flies, surrounding the ocelli.
Vibrissae—The large bristles arising from the vibrissal angles at the sides of the mouth in many Cyclorrhaphous Diptera. This term has been misapplied to include the bristles sometimes found on the facial ridges.

Vibrissal angles—The more or less rounded angles formed by the facial ridges just above the oral margin.

Viviparous—Bringing forth living young.
For the convenience of those who may not be familiar with American literature on Entomology lists of general works on Diptera and periodicals, etc., published in North America is given. This list is not complete but includes the more important publications. Occasionally descriptions are published in other journals but the number is small. Certain journals contain more papers dealing with flies than others, but there is a great deal of variation over a period of years. Monographic work on American insects is greatly handicapped because there is no medium of publication, most journals accepting only short papers.

General Works for Students of Diptera


Loew, H.—Monographs of the Diptera of North America. Dolichopidae, Ephydridæ, Otitidæ, Tetanoceridæ and Trypaneidæ. Most of the species have been elucidated in later work.


Say, Thomas—The Complete Writings of Thomas Say on the Entomology of North America (Two volumes).


Current North American Periodicals Dealing Entirely With Entomology

Annals of the Entomological Society of America.
Bulletin of the Brooklyn Entomological Society.
Canadian Entomologist.
‡ Entomologica Americana (Published by Brooklyn Entomological Society).
Entomological News.
† Insecutor Inscitise Menstruus.
Journal of Economic Entomology.
Journal of the Kansas Entomological Society.
Journal of the New York Entomological Society.
‡ Memoirs of the American Entomological Society.
Pan Pacific Entomologist.
Psyche.
‡ Thomas Say Foundation of the Entomological Society of America.
Transactions of the American Entomological Society.

* No parts on Diptera published.
† Publication discontinued. Mostly Diptera and Lepidoptera.
‡ Irregular publications.
Scientific Publications Containing Entomological Papers

American Journal of Hygiene.
American Museum Novitates (American Museum of Natural History).
Anales del Instituto de Biologia (Mexico City).
Bulletin of the American Museum of Natural History.
Bulletin of the Buffalo Society of Natural Sciences.
Bulletin of the Illinois State Laboratory of Natural History.
Journal of the Washington Academy of Sciences (D. C.)
Kansas University Science Bulletin.
Occasional Papers of the Boston Society of Natural History.
Ohio Journal of Science.
Proceedings of the California Academy of Sciences.
Transactions of the Royal Canadian Institute.
Transactions of the Royal Society of Canada.
Transactions of the Wisconsin Academy of Sciences, Arts and Letters.
Zoological Record (London, England). Separate parts may be obtained.
Lists all new species described each year.
See also Government publications of the United States, Canada and the States and Provinces.

CORRECTIONS

Page 327. Leucophanga Mik. Most species of this genus will trace to couplet 10, where they may be distinguished by having the costa ending at the third vein.

Page 359. For Microdiopsis, n. g. read Pseudodiopsis Hendel. The genotype is the same.
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