

**THE DIPTERA OF MINNESOTA:  
TWO-WINGED FLIES AFFECTING  
THE FARM, GARDEN, STOCK  
AND HOUSEHOLD, PP. 19-164**

Published @ 2017 Trieste Publishing Pty Ltd

ISBN 9780649529346

The Diptera of Minnesota: Two-Winged Flies Affecting the Farm, Garden, Stock and Household, pp. 19-164 by F. L. Washburn

Except for use in any review, the reproduction or utilisation of this work in whole or in part in any form by any electronic, mechanical or other means, now known or hereafter invented, including xerography, photocopying and recording, or in any information storage or retrieval system, is forbidden without the permission of the publisher, Trieste Publishing Pty Ltd, PO Box 1576 Collingwood, Victoria 3066 Australia.

All rights reserved.

Edited by Trieste Publishing Pty Ltd.  
Cover @ 2017

This book is sold subject to the condition that it shall not, by way of trade or otherwise, be lent, re-sold, hired out, or otherwise circulated without the publisher's prior consent in any form or binding or cover other than that in which it is published and without a similar condition including this condition being imposed on the subsequent purchaser.

[www.triestepublishing.com](http://www.triestepublishing.com)

**F. L. WASHBURN**

**THE DIPTERA OF MINNESOTA:  
TWO-WINGED FLIES AFFECTING  
THE FARM, GARDEN, STOCK  
AND HOUSEHOLD, PP. 19-164**



EXPLANATION OF PLATE I.

(Figures are all natural size.)

1. *Sargus viridis*, Say, *Stratiomyidae*.
2. *Eurosta* (*Trypeta*) *solidaginis*, Fitch, *Trypetidae*.
3. *Odontomyia binotata*, Loew, *Stratiomyidae*.
4. *Chrysophila thoracica*, Fab., *Leptidae*.
5. *Straussia* (*Trypeta*) *longipennis*, Wied., *Trypetidae*.
6. *Pseudopyrellia* (*Lucilia*) *cornicina*, Fab., *Muscidae*.
7. *Odontomyia cincta*, Oliv., *Stratiomyidae*.
8. *Echinomyia* (*Jurinia*) *algens*, Wied., *Tachinidae*.
9. *Eristalis tenax*, Linn., *Syrphidae*.
10. *Gastrophilus equi*, Clark, *Oestrideae*.
11. *Heliophilus latifrons*, Loew, *Syrphidae*.
12. *Calliphora vomitoria*, Loew, *Syrphidae*.
13. *Tabanus costalis*, Wied., *Tabanidae*.
14. *Spilomyia quadrifasciata*, Say, *Syrphidae*.
15. *Thereva frontalis*, Say, *Therevideae*.
16. *Eristalis flavipes*, Walk., *Syrphidae*.
17. *Leptis mystacea*, Macq., *Leptidae*.
18. *Chrysops hilaris*, O. S., *Tabanidae*.
19. *Psilopodinus patibulatus*, Say, *Dolichopodidae*.





EDITH REED, DEL.

A. STEINHAUER, SCULPTOR.

PLATE I. SOME MINNESOTA FLIES.

# THE DIPTERA OF MINNESOTA.

---

## TWO-WINGED FLIES AFFECTING THE FARM, GARDEN, STOCK AND HOUSEHOLD.

---

BY F. L. WASHBURN, State Entomologist.

When one reflects that out of the \$795,100,000 which the United States loses annually at the hands, or rather at the mouths, of insects, the Hessian Fly alone is responsible for \$50,000,000 a year (raised to \$100,000,000 in 1900); that the loss on hides caused by the work of the Ox Warble Fly has frequently amounted to \$40,000,000 a year, or higher, in the United States; and that our crop of cabbages and cauliflowers is frequently lessened by one-half through the agency of the disgusting Cabbage maggot fly, one can readily see that, in spite of benefits derived from certain members of the order, the members of Diptera, or Two-winged Flies, clearly rank among our serious pests, and are worthy of a special treatise.

Not only does stock suffer from the Ox Warble, and to a less degree from what we call "horse flies", "deer flies" and "bot flies," but at times and in certain localities it perishes through the attacks of myriads of black flies, the small voracious pest so abundant during summer in northern localities of the United States and Canada as to sometimes cause the death of a man lost in the woods and enfeebled through fatigue and lack of food. Certain domestic animals in South Africa suffer and die through what is called "Nagana" or the "fly disease," induced by a germ introduced into the blood by the bite of the notorious Tse-tse Fly. Much more serious than this is the part many two-winged flies play in relation to diseases which cause suffering among hundreds of people, and at times are the active agents in awful epidemics. We refer to the mosquito, *Anopheles*, whose bite is evidently a necessary means of carrying the malarial germ; to that other mosquito known as



*Stegomyia fasciata*, which is the direct cause of the spread of yellow fever; to various flies, among them the dangerous Screw-Worm Fly, which lay their eggs in wounds and external cavities of men and animals, causing suffering and frequent death, and particularly to our common, ever present house fly, which is a constant menace as a carrier of disease germs. It is said on good authority that while only about 250 men were killed in battle during the Spanish-American war, we lost 5,000 through the agency of house flies. This refers to the carrying of typhoid germs from hospital trenches to the food and other effects of our men while in camp.

While denouncing the above pests, we must not lose sight of the fact that we also find in this same order some beneficial forms, notably the Tachina Flies, which, very abundant as far as individuals go, are of marked assistance to the farmer and gardener, by parasitizing injurious caterpillars and preying upon grasshoppers and other pests. We also have the Syrphus Flies, the larvae of many of which feed upon plant lice, nor must we overlook the benefit which we derive indirectly from the removal of carrion and decaying vegetable matter through the work of the maggots of Blow Flies, Flesh Flies, and others. These points are emphasized in the following treatise in connection with the useful species. However, in mentioning this fact it may be well to bear in mind that the same is true of a number of injurious orders, wherein we find some redeeming features, but not sufficient to remove these orders from under the ban.

We quote Osten-Sacken, a prominent worker in Dipterology, who has the following to say regarding this group:

Diptera during the past century have gradually risen in public estimation, especially among men of science. The superiority of their organization has been recognized by systematists, and observers of living specimens have noticed peculiarities in their behavior which prove a higher development of their faculties than of those of other orders.

Diptera, more than all other insects, show a distinct love of *freedom*, while Hymenoptera, with all their perfections, betray *drill*. Owing to their organization, Diptera have more control over their motions than any other insects, in consequence of which there is a remarkable stamp of *individuality* in their actions. They can suddenly arrest their flight, and poise in the air; they can not only swarm, but *dance* in cadence, or gambol in the air in the most extraordinary manner. It is principally the males who dance, play and frolic together; during courtship they perform most ludicrous antics. Schiller said: "The ani-

mal, the child, as well as man, *play*; the sense of strength, and the higher sense of freedom derived from strength, give rise to the joy of playing."

It was evidently the intention of our predecessor, Dr. Lugger, to publish a monograph on the *Diptera* of Minnesota, as he had on the four orders, *Orthoptera*, *Coleoptera*, *Lepidoptera*, and *Hemiptera*, before death put an end to his valuable work. We found some drawings and other evidence of this intention on his part, and it seemed quite fitting and a mark of respect to the memory of him who stood for so much in Entomology to endeavor to complete the work he undoubtedly had in mind. There is, further, a demand on the part of our agriculturists, stock raisers and others for a report on the pests which occur in this group, with remedies for the injuries caused by them, or means to prevent such injuries.

For four years, therefore, we have been accumulating specimens, drawings and data with that end in view. Dr. Lugger was no man for notes. He left absolutely no data in this group, and this fact has added materially to the difficulties of the work. It must be acknowledged, too, that the labor involved in properly depicting this one group alone, as it occurs in Minnesota, is so great that we feel, in its presentation, we have fallen short of the ideal cherished by us at its first conception. Yet, although humbled by this realization, we present this report on the "DIPTERA, OR TWO-WINGED FLIES OF MINNESOTA," without an apology, hoping that through means of the excellent illustrations and the two colored plates the citizens of the state may be able to recognize the leading pests, and also beneficial insects which occur in this group, and that the student who is interested in the flies of Minnesota may be helped in his study. In fact, with this latter end in view, we have so arranged the report that it may, like other similar publications from this department, which have been in great demand, serve a double purpose, namely, while it is primarily a bulletin on injurious flies, it can at the same time be used in schools, illustrating, as it were, one department of rural school agriculture. At the end of the book will be found a complete index, together with a special index of two-winged pests and remedies therefor.

In accomplishing this work we have been hampered by lack of data, as mentioned above; in some cases by erroneous labeling of specimens which we found in the collection, notably in the family

of *Simuliidae*. We have not hesitated, therefore, to ask for co-operation wherever needed, and have called upon specialists in certain groups for identifications. These have been cheerfully given. Many of the Empidids and Dolichopods were identified by W. M. Wheeler; Stratiomyids and Leptids by C. W. Johnson; Phorids by C. T. Brues, and the snarl in the condition of our Simuliids was unraveled by O. A. Johannsen. We have sent many specimens to Mr. Coquillet of the Bureau of Entomology at Washington, for corroboration of our own identifications, or for the independent naming of specimens, and a large amount of material from this office has passed through his hands. The colored drawings have all been made in this department, and under our direction, by Miss Edith Reed. The same is true of a very large proportion of the figures in the text. A few of the latter, however, have been used in previous publications of this department, and a very few have been obtained from outside sources. Fig. 150 is one of Prof. Slingerland's; Fig. 29 was obtained from Vernon Kellogg; Figs. 34 and 35 appeared in "How to Make a Flower Garden" published by Doubleday Page & Co., Fig. 36 was obtained from the Department of Agriculture at Washington, D. C., and is one of Dr. L. O. Howard's. We hereby acknowledge these courtesies. Many of the photographs were made by Mr. A. G. Ruggles, my assistant.

A large amount of dipterous material, representing many months of collecting, was kindly placed at our disposal through the courtesy of O. W. Oestlund, of the Department of Zoology in the State University. This has been of material help. Dr. E. B. Frick, of Fort Snelling has collected certain Culicids not previously in our collection, and has courteously given us data in this connection.

The word "Fly" in common parlance, is frequently applied to almost everything in the insect line which has the power of flight. It really belongs only to one order of insects, the Diptera, in which only one pair of wings (the front pair) is present, the rear pair being absent, but represented by two "halteres" or "balancers," knob-like organs to which various functions are ascribed by workers in entomology. We have in North America over 8,000 known species of these two-winged flies, representing sixty families, and in the following pages these various families