

FABAE Scopoli, APHIS
Viburnum trilobum: Vancouver (URC), Jul3/75, Sep3/75.

MORRISONI (Swain), MASONAPHIS
Chamaecyparis bisifera Plumosa!: Vancouver (UBC), Jul30/74.

PRUNI (Geoffroy), HYALOPTERUS
Prunus domestica: Summerland, Oct25/74.
Typha latifolia: Salmon Arm, Aug18/74; Vancouver (U8C), Aug9/74.

Fig. 5. Figure 3b in publishable form.

References

- Forbes, A. R., B. D. Frazer and H. R. MacCarthy. 1973. The Aphids (Homoptera: Aphididae) of British Columbia. 1. A Basic Taxonomic List. *J. Ent. Soc. Brit. Col.* 70:43-57.
- Forbes, A. R. and B. D. Frazer. 1973. The Aphids (Homoptera: Aphididae) of British Columbia. 2. A Host Plant Catalogue. *J. Ent. Soc. Brit. Col.* 70:58-68.
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- Miller, A. 1975. The UBC Report Generator. Computing Center, the University of British Columbia, Vancouver, B.C., Canada V6T 1W5.

BOOK REVIEW

Mamaev, B. M. 1974. *Evolution of gall forming insects—gall midges* (English Edition). Translated by A. Crozy, edited by K. M. Harris. Published by The British Library, Lending Division, printed by W. S. Maney Ltd., Leeds, England, 317 pp. 79 figs. Size 6" x 8½" (15.5c x 22c). Paper cover. Price £ 8.50, + \$15.00. (Translation of Russian Edition, published by "Nauka", Leningrad, 1968).

This book is a monograph of the family Cecidomyiidae that focuses on the origins, the lines and the patterns of evolution. It defines the family, the subfamilies, the tribes and subtribes in terms of the morphology, anatomy and ecology of all stages, but it contains no taxonomic keys. The author's primary purpose is to outline the evolutionary development of gall midges, and from this, to construct a logical classification. Thus, the classification adopted in the first chapter is, in effect, the practical outcome of the contents of the remaining seven chapters. The book is the culmination of 15 years work, beginning in 1951, on the native gall midge fauna of the European U.S.S.R., the Caucasus, Central Asia and the Far East. The collation of collections from different habitats (soil, litter, wood and living plant tissues) from these geographically distant and ecologically distinct areas (forests, steppes, deserts and mountains) provide the factual bases for the theoretical constructions developed.

Dr. Mamaev is well qualified to undertake such a project. He obtained his Ph.D under Prof. E. S. Smirnov, Head, Department of Entomology, Moscow State University, about 1951, and then went to work at the Institute of Evolutionary Morphology and Ecology of Animals, (Laboratory of Soil Zoology) Soviet Academy of Sciences in Moscow. Since then he has been a prolific researcher (author or co-author of 38 papers cited in the book), especially on Cecidomyiidae. All his work has been based on a multidisciplinary approach and most of his findings reflect a thoroughness and a soundness rarely encountered. His book is based largely on his own findings, coupled with first-hand information from colleagues with similar interests. Thus his book is built on a solid foundation of personal investigations and knowledge, and is much more than a synthesis of previously published data.

Part one, consisting of four chapters, deals primarily with the morphological aspects of the evolution of gall midges. Chapter one consists of diagnoses of the family, subfamilies, tribes and the subtribes; it also provides a modern classification of the family breaking it into two subfamilies: the Lestremiinae with three tribes, Lestremiini, Moehniini (since eliminated because the only known species belongs to the Sciaridae), and Micromyiini, and the Cecidomyiinae with six tribes, Heteropezini, Porricondyliini, Oligotrophini, Lasiopterini, Ceci-

domyiini and Asphondyliini. Chapter two describes the evolution of the larvae from the standpoints of morpho-ecological types, adaptive changes in the integument, the head structures and the digestive systems. Chapter three deals with the evolution of the adults in a similar manner but with special emphasis on development of winglessness, changes in sense organs, and the form of the male and female terminalia. Chapter four is an analysis of the occurrence patterns of morphological characters in larvae and adults, ending in a dendrogram showing the "phylogenetic links of the major taxonomic groups of gall midges." Of special interest is a discussion on the exchange of secondary sexual characters between males and females, e.g., feminization of antennae in males, and the significance of such phenomena in classification. Unfortunately the dendrogram (Fig. 45) summarizing the ideas of this chapter is poorly organized. It shows the subfamily Cecidomyiidae as a monophyletic group arising from a single subtribe (Catochina) of the Lestremiinae. This, in effect, makes the Cecidomyiinae a sister-group of the subtribe Catochina and makes the subfamily Lestremiinae a paraphyletic group. In the text, however, and in a subsequent phylogenetic chart (Fig. 79) the Cecidomyiinae are correctly treated as a sister-group of the Lestremiinae, i.e., arising from the common ancestor of all Cecidomyiidae.

The second half of the book also contains four chapters and deals mainly with the ecological aspects of the evolution of the gall midges. Chapter five considers the ecological prerequisites for proliferation of gall midges—adaptations for expansion into different hosts and geographic areas, and adaptations for intensifying the multiplication and survival of species. Chapter six deals with the ecological pathways leading to mycetophagy, phytophagy and gall formation; it also includes discussions on gall midges as plant parasites and on the importance of flowers in their evolution. Chapter seven treats special aspects of gall fly speciation and gall formation in plants; one of the main points made is that host data and the forms of the galls are not always reliable criteria for species identification. Chapter eight reviews the paleontological data relating to gall midges, and discusses the main stages of evolution of the family in relation to geological ages, ecological backgrounds and the evolution of plants. The author concludes that the Cecidomyiidae are a sister-group of the Mycetophilidae and he provides a phylogenetic chart showing the evolution of all the tribes within the family. The final pages include an appendix outlining techniques for collecting and

studying gall midges, lists of references in Roman and Cyrillic alphabets and an index of the Latin names of insects referred to in the text.

The book fulfills a real need for this large and difficult group, possibly the largest family of Diptera. The author has managed successfully to analyse and synthesize an immense amount of information from the whole spectrum of biosystematics and to construct a classification that appears to be both practical and in harmony with the evolutionary patterns of the group. He has introduced a wealth of new facts and ideas and has provided a very real addition to our knowledge on almost all aspects of the biology and systematics of these flies. No other book covers the subject so thoroughly or so well. As the author himself states, however, refinements and improvements will appear as further progress is made on this and related families. For example, the genus *Moehnia* (known from females only of one species) is now known to be an aberrant member of the Sciaridae, thereby eliminating one of the tribes of the Lestremiinae. Such developments are to be expected and do not reduce the overall value of the book.

This edition is a translation, and the translator and the editor have wisely adhered to a policy of exactly portraying the thoughts of the author rather than producing smooth, beautiful English. This results in a style that is sometimes heavy and awkward, but in general Messrs. Crozy and Harris are to be complimented for an easily readable rendition. The author's method of providing separate conclusions at the end of each chapter has resulted in a certain amount of repetition, but this is not a bad fault. The book itself was printed by photographic means from typewritten pages, and it has the general appearance of a xeroxed thesis. The right margin of each page is very uneven and in a few instances (pp. 22, 134) the reproduction is poor; the half tone photographs (about half the figures) also suffered as a result of this type of reproduction. The paper is of good quality, but the binding is extremely poor; many pages of my copy have become detached from the spine of the book.

There can be no doubt that his work represents a very significant step forward in our knowledge of gall midges, and that it will be a basic reference for many years. Anyone who has any interest in the family should have a copy.

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