Abstract

This volume deals with North European species of the family Chloropidae, known as frit flies or chloropid flies, a large family of acalyptrate flies including some notarial, economically pests of cereals and fodder grasses. The taxonomy, biology and faunistics of all NW European species are revised. Keys are given to subfamilies, genera and species for the adults, for the larvae to generic level as far as possible, and to specific level for a few genera. Brief descriptions of the adult flies are given for all genera and species. Species distributions in Fennoscandia and Denmark and elsewhere are briefly outlined and further tabulated in a catalogue. The known biology and ecology is summarized in general chapters and for each species. Illustrations are given of the male genitalia and also of other characters of diagnostic importance.

From Fennoscandia and Denmark are known 48 genera and 209 species of frit flies: Rhodesiellinae 1 species, Oscinellinae 111 species, Chloropinae 97 species. Among them 119 species are known from Denmark, 97 from Norway, 189 from Sweden, 144 from Finland, and 115 from included provinces of Russia (Karelian Isthmus, Karelia, and the Kola Peninsula). One new genus and 11 new species are described, and some new synonyms and nomenclatural changes are proposed. Some other new species, new synonyms, and overlooked specific names resulting from this revision have been published earlier (Nartshuk, 1992, 1998, 1999, 2002a; Nartshuk & Andersson, 2002; Nartshuk & Przhiboro, 2009; Nartshuk & Tschirnhaus, 2012).

List of new taxa, synonyms and nomenclatural changes

New taxa:

Colliniella gen. nov.; type species: Conioscinella meijeri Duda, 1933.
Aphanotrigonum norrbotticum sp. nov. from North Sweden.
Calamoncosis halterata sp. nov. from Sweden.
Chlorops bjerkanteri sp. nov. from Sweden.
Conioscinella abiskoi sp. nov. from North Sweden.
Conioscinella messaurea sp. nov. from North Sweden.
Conioscinella tornensis sp. nov. from North Sweden.
Dicraeus tjedri sp. nov. from southern Sweden.
Eribolus danicus sp. nov. from Denmark and Sweden.
Gaurax norvegicus sp. nov. from Norway and Sweden.
Gaurax suecicus sp. nov. from Sweden.
lasiosina danielssoni sp. nov. from Gotland, Sweden.
Meromyza bifurcata sp. nov. from Sweden.

Rhopalopterum tomentosum sp. nov. from North Sweden.

Restored from synonymy:

Oscinis ephippium Zetterstedt, 1848.

New synonyms:

Aphanotrigonum brachypterum (Zetterstedt, 1848) = Aphanotrigonum trilineatum var. micropterus Duda, 1932.
Aphanotrigonum cinctellum (Zetterstedt, 1848) = Oscinis fasciella Zetterstedt, 1855.

Dicraeus nitidus Wahlgren, 1913 = Dicraeus napaevus Collin, 1946.


Gaurax ephippium (Zetterstedt, 1848) = Gaurax strobilum Karps, 1981.

Trachysiphonella ruficeps (Macquart, 1835) = Chlorops pygmaeus Meigen, 1838 = Oscinis flavella Zetterstedt, 1848 = Siphonella diplotoxoides Strobl, 1893.
New combination and status:
*Microcercis kroeberti* (Duda, 1933).
Lectotype designations:
*Aphanotrigonum trilineatum* var. *micropterum* Duda, 1932.
*Gaurax borealis* Duda, 1933.

**Introduction**

The purpose of the present work is to present a revision of the species of Chloropidae or “frit flies” in a broad sense, also known as chloropid flies or grass flies, occurring in NW Europe with special emphasis on Denmark, Sweden, Norway, Finland and the adjacent Russian provinces of the Fennoscandian Peninsula. It provides keys to subfamilies, genera and species, descriptions of adult and larval morphology, biology, and local and Palearctic distribution. Chloropidae is a large family of small acalytrate flies usually 2.0–4.0 mm in length, exceptionally 5.0–8.0 mm. They are morphologically and ecologically very diverse. The flies may be found in practically all kinds of terrestrial habitats. Greatest diversity and abundance of species is usually found in open landscapes ranging from sandy coasts, over dry to humid grasslands to bogs, fens, marshes and other types of wetlands. Fewer chloropids are specialized forest inhabitants. The common name of these flies contains in many languages the word “frit”: frit flies, Fritfliegen, fritflugor, fritfluer. This word was used by C. Linnaeus, when he described the first species of the family as *Musca frit* (now known as *Oscinella frit*), a serious pest of cereals in many European countries.

The very first studies on chloropid flies came from Swedish entomologists: C. Linnaeus (1707–1778), C. Bjerkander (1735–1795), C.F. Fallén (1764–1830), J.W. Zetterstedt (1785–1874) and dealt with the local fauna. Their studies proved particularly important because they both contained descriptions of new species and contributed information on the biology and damage to agricultural crops caused by these flies. Many European and Palearctic species of Chloropidae were first described on basis of specimens originating from Sweden. Very many chloropids in Europe have their northernmost distributional limit running through Sweden and the neighboring countries Norway and Finland.

Most frit flies, especially those belonging to the subfamily Chloropinae, have phytophagous larvae. In spite of their small size, their abundance gives them an important role in grass ecosystems as first level consumers. Their role as pests of cereals and cultivated grasses should also not be neglected. Increased abundance of certain species of Chloropidae is used as a bioindicator that cereals and grasses are under environmental stress, e.g. from draught or industrial pollution.

The studies made in preparation of the present book had some spin-off in terms of descriptions of new species from Fennoscandia and Denmark, new synonymies, finds of overlooked names, and a proposal for conservation of a specific name (Nartshuk, 1992, 1998, 1999, 2002a, 2004; Nartshuk & Andersson, 2002). Still, not all taxonomical problems concerning Scandinavian Chloropidae have been settled with the present book. Especially the taxonomic problems within Oscinella may not be fully elucidated on basis of morphology alone.

The morphological terminology follows that proposed in the Manual of Nearctic Diptera (McAlpine, 1981). The treatment of each species begins with the valid name followed by the original combination followed by synonyms established after the Catalogue of Palearctic Diptera, vol. 10 (Soós & Papp (eds), 1984) and listed chronologically with their bibliographic references. Then follows a diagnosis and description to ensure correct differentiation from related species. These are supplemented with illustrations, mainly line drawings, of male genitalia and sometimes other body parts for nearly all the species. A few species cannot be safely identified without examination of the male and female genitalia. Each description is followed by an outline of the known distribution in Denmark and the Fennoscandian countries, and worldwide. Then follows a brief outline of bionomics in terms of phenology, habitat preferences and larval host plants. That piece of information, especially about host plants, is often based on extralimital observations in the absence of local data.

A Catalogue giving the known distribution by faunistic province for each species in Denmark and Fennoscandia is provided in the format practiced in previous volumes of the series.