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European grassflies of the genus *Meromyza* Meigen (Diptera: Chloropidae)

by E.P. Nartshuk

Abstract. At present 36 species of *Meromyza* Meigen are recorded from Europe. They may be divided into the following biogeographical elements: Holarctic - 3 species, transpalaeartic boreal - 4 species, transpalaeartic steppe - 2 species, euro-siberian boreal - 2 species, euro-kazakhstanian - 2 species. The largest group is formed from 23 european species. Seven of these species are widespread in Europe, and 16 have a local distribution. The distribution of some species of *Meromyza* is compared with the distribution of their host-plants, the grasses (Poaceae).

Keywords. Chloropidae - *Meromyza* - biogeography - ecology

Introduction

Meromyza is one of the largest genera of Chloropidae with about 90 valid species. The genus is mainly Holarctic in distribution, Only one species, *Meromyza reclinans* Becker, is known from the Afrotropical Region (BECKER, 1913). The Afrotropical genera *Meromyzella* Andersson and *Archimeromyza* Deeming share some features with *Meromyza*, but the relationship of *Meromyza* with these genera is unclear. The great majority of the species of *Meromyza* occur in the Palaearctic. 62 species are now known in the Palaearctic (NARTSHUK, 1984) and 26 species in the Nearctic Region (FEDOSEEVA, 1971).

The majority of the species were described after 1960. DUDA (1933) mentioned only three valid species in his work on Palaearctic Chloropidae and ten names were placed in synonymy. Almost all the synonymized species were resurrected and now are considered as valid species. Many new species were described by several authors, especially by Lidia Fedoseeva. The fauna of *Meromyza* was investigated in Hungary, Bulgaria, Great Britain, and Finland in recent years (DELY-DRASKOVITS, 1978; BESCHOVSKI, 1985; ISMAY, 1981; NARTSHUK 1992 respectively).

Material and Methods

The genus is characterized as follows. Body rather slender and elongate, 3-7 mm long, mostly greenish or greenish-yellow in colour with black or reddish longitudinal stripes on notum, middle stripe continued through scutellum in most species. Abdomen and pleura of thorax with dark or reddish marks. Chaetae few and minute. Wing with radial veins strongly concave anteriorly, costa short, ending at about the middle of the anterior margin of the wing. Hind femur strongly thickened and with two rows of small black warts on ventral side. A very remarkable feature of the genus is the rather strongly sclerotized, usually black gonite in the male genitalia. The form of the postgonites are specific and important for species identification. The form of the male genitalia is the only distinguishing character for many species. Females of most species are indeterminate.

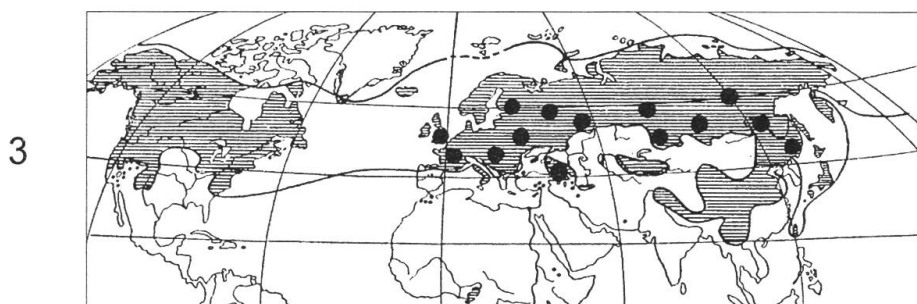
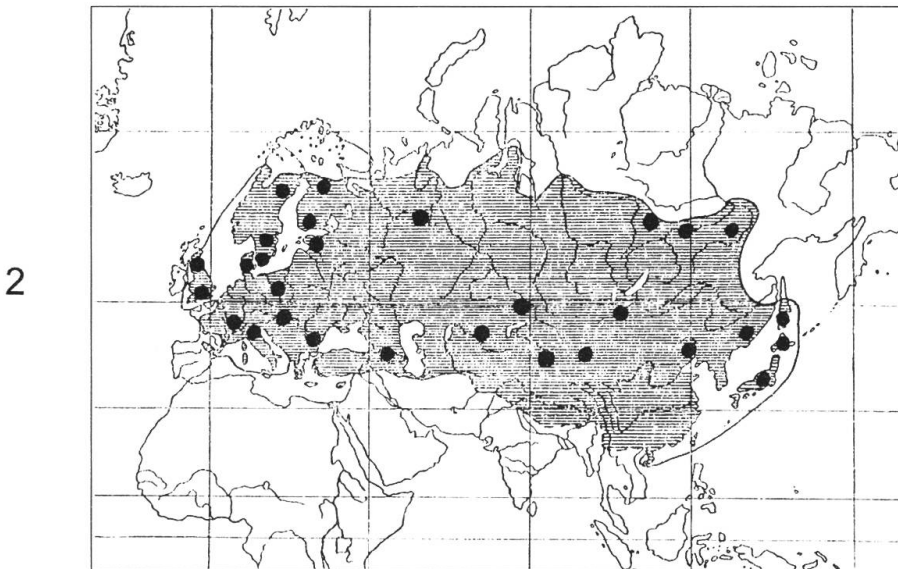
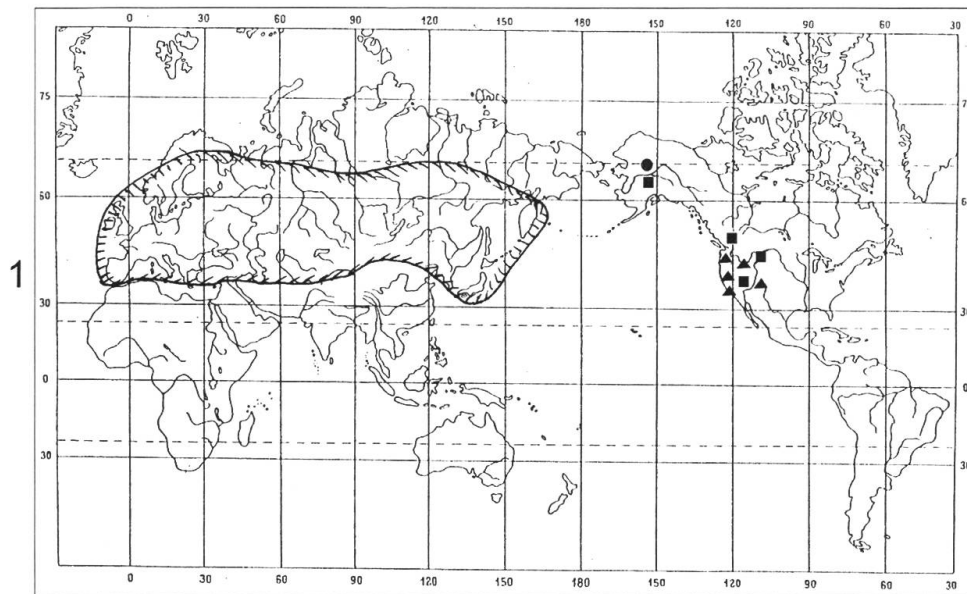
The enlarged and sclerotized postgonite is an apomorphic character of *Meromyza* and the genus is monophyletic. The concentration of the wing venation on the costa and the thickening of the hind femur indicate an increasing role of movement (flying and jumping) in the evolution of the genus. Indeed species of *Meromyza* usually inhabit open habitats and are abundant in the steppe zone. The members of the genus are associated with gramineous plants. The larvae are phytophagous and develop in shoots of grasses belonging to 22 genera of Poaceae. The following grasses are known as host plants of *Meromyza* species: *Aegilops*, *Agropyron*, *Agrostis*, *Arrhenatherum*, *Calamagrostis*, *Cleistogenes*, *Corynephorus*, *Dactylis*, *Deschampsia*, *Hordeum*, *Elymus*, *Elytrigia*, *Festuca*, *Hierochloe*, *Koeleria*, *Lolium*, *Nardus*, *Phleum*, *Poa*, *Puccinellia*, *Secale*, and *Triticum*. Information on the host-plant relationships of *Meromyza* species is insufficient to draw conclusions but some species seem to be monophagous and the majority oligophagous. Another large genus, *Chlorops* Meigen, with phytophagous larvae and belonging to the same subfamily of Chloropidae is worldwide. The larvae of *Chlorops* develop in shoots of Poaceae and Cyperaceae. Species of both genera are often found in the same habitats. The spectrum of ecological niches of the two genera partially overlap but do not coincide. The species of *Meromyza* are mesophilous and xerophilous and more thermophilous than species of *Chlorops*, which are mesophilous and hydrophilous. On the other hand it seems the genus *Pachylophus* Loew is an ecological vicariant of *Meromyza* in the Afrotropical Region. Species of *Pachylophus* are xerophilous, and share some features with *Meromyza*: slender elongated body, thickened hind femur, phytophagy of larvae.

I have had the opportunity to study European *Meromyza* in the collections of the Zoological Institute of Russian Academy of Sciences in St Petersburg; Zoological Museum of the Helsinki University; Zoological Museum of the Humboldt University in Berlin; Deutsche Entomological Institut in Eberswalde; Zoologisches Forschungsinstitut und Museum A.Koenig in Bonn; Naturhistorisches Museum in Vienna; Riksmuseum in Stockholm; Zoological Museum of the Lund University and some collections in Baltic countries.

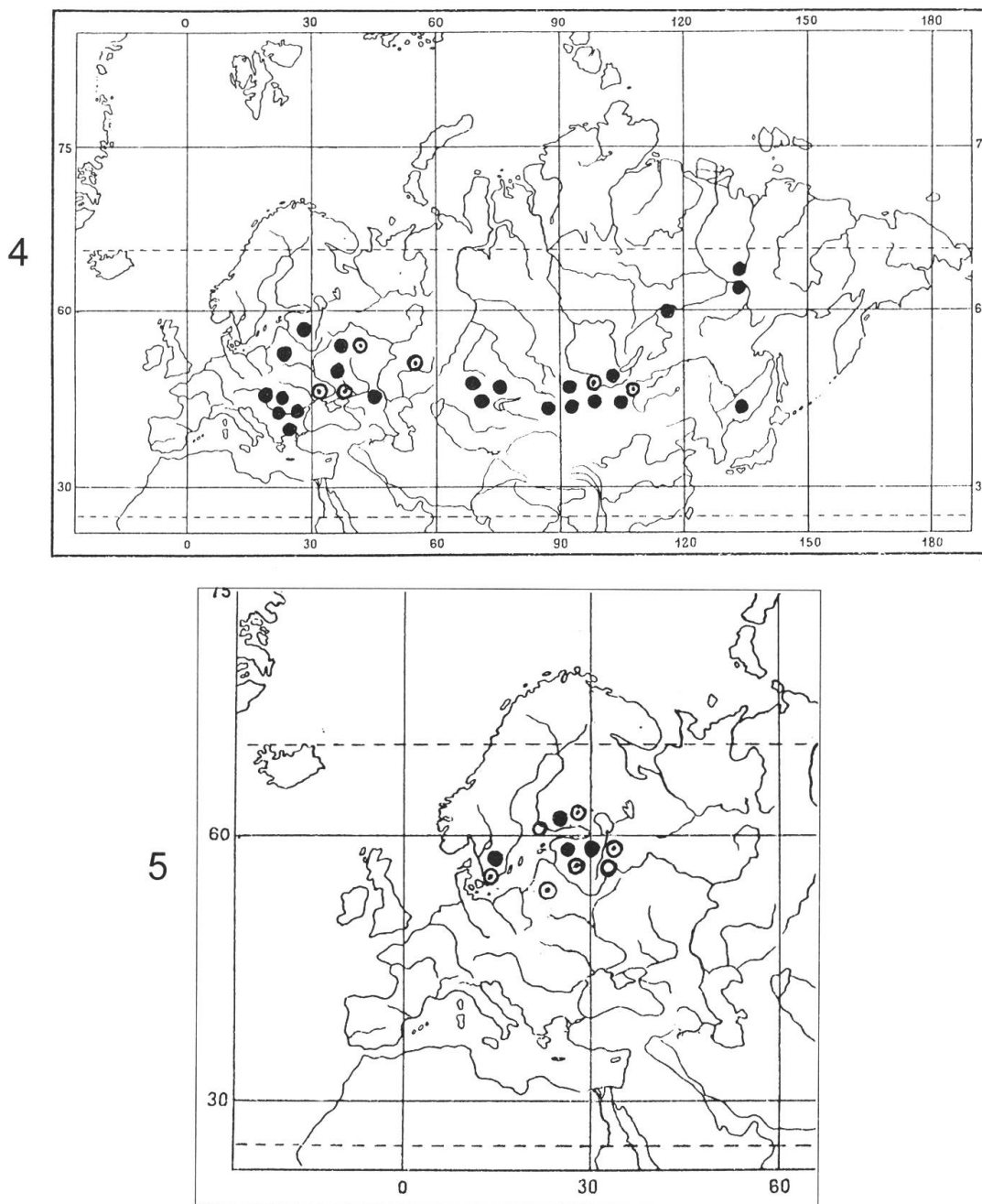
At present 36 species of *Meromyza* are recorded in Europe. Local faunas usually consist of 15-17 species: Great Britain, Hungary, Bulgaria, Sweden, Czech and Slovak Republics - 16 species in each country, Italy - 13 species, Ukraine - 15 species, Estonia - 17 species, Finland - 17 species, European part of Russia - 29 species. The northern limit of distribution of the genus as a whole is within the Polar circle, but only a few species in Europe, viz. *M. saltatrix* Linnaeus, *M. pluriseta* Peterfi and *M. mosquensis* Fedoseeva were found on the Kola Peninsula. In comparison, in the more continental situation in Yakutia (East Siberia) 12 species are found within the Polar circle on the steppe slopes.

There are 36 species recorded in Europe of which 23 species are distributed only in Europe. Several biogeographical elements may be recognized within Europe.

2. Holarctic species: *M. nigriventris* Macquart, *M. pratorum* Meigen, and *M. saltatrix* Linnaeus. All three species are widespread in the Palaearctic and rather abundant everywhere, but all three are known only in western part of the Nearctic (Fig.1). Larvae of *M. nigriventris* Macquart and *M. saltatrix* Linnaeus develop in shoots of many grasses, larvae of *M. nigriventris* Macquart prefer species of *Roegneria* and related



Figs 1-3: 1, Distribution of holarctic species of *Meromyza* Meigen in the Palearctic and the Nearctic Regions. Filled circles - *M. saltatrix* Linnaeus, filled squares - *M. pratorum*, filled triangles - *M. nigriventris* Macquart, hatching area of these three species in the Palearctic Region. 2, Distribution of *Meromyza pratorum* Meigen (filled circles) and its host-plant grass *Calamagrostis epigeios* (hatching) in the Palearctic Region. Distribution of grass after MEUSEL, JAGER & WEINERT, 1965. 3, Distribution of *Meromyza ornata* (Wiedemann) (filled circles) and its host-plant grass *Deschampsia caespitosa* (hatching). Distribution of grass after MEUSEL, JAGER & WEINERT, 1965.



Figs 4-5: 4, Distribution of *Meromyza smirnovi* Fedoseeva (circles with point) and *M. zachvatkini* Fedoseeva (filled circles). 5, Distribution of *Meromyza elbergi* Fedoseeva (filled circles), *M. lidiae* Nartshuk (circles with point) and *M. zimzerla* Nartshuk (open circles).

genera, including *Triticum*. This species damages winter and summer wheat and barley. Larvae of *M. pratorum* Meigen live in shoots of *Calamagrostis epigeios* and *Elymus* sp. The distribution of *M. pratorum* fits the distribution of *Calamagrostis epigeios* in the Palearctic (Fig. 2) rather well.

2. Transpalearctic boreal species: *M. curvinervis* Zetterstedt, *M. ingrlica* Nartshuk, *M. ornata* Wiedemann. The latter species is rather common everywhere, their larvae live in shoots of the common grass *Deschampsia cespitosa*, while the two former species are rather rare. Their host-plants are unknown. It is worth noting that

Deschampsia cespitosa is a Holarctic species, but *M. ornata* lives on the grass only in the Palaearctic part of its areal (Fig.3).

3. *M. sibirica* Fedoseeva probably has a transpalaearctic distribution. The species is rather common in Siberia and extends to Japan, but is very rare in Europe. Only a few specimens were found in the European part of Russia, Estonia, Finland, Sweden, Germany, and Austria and it was not found in the west of Europe. The species seems to have had a Siberian origin.

4. Euro-siberian species: *M. nigriseta* Fedoseeva, *M. pluriseta* Peterfi. The eastern borders of their areas are Yakutia and Mongolia.

5. Euro-kazakhstanian species: *M. laeta* Meigen, and *M. neglecta* Fedoseeva. The former species is known in West Europe, but *M. neglecta* Fedoseeva is distributed from the Ukraine to Tian-shan.

6. *M. zachvatkini* Fedoseeva is known from Hungary to the Far East, being found mostly in the steppe zone and in sandy habitats in the boreal zone, the most northern locality is sandy habitats in southern Estonia (Fig. 4).

7. *M. smirnovi* Fedoseeva is known in the European part of Russia and Estonia to Mongolia, also mostly in the steppe zone and sandy habitats in the boreal zone (Fig. 4).

8. Species which are limited to Europe form the largest group - 23 species with different distributions.

8a. Widespread European species: *M. bohémica* Fedoseeva, *M. femorata* Macquart, *M. mosquensis* Fedoseeva, *M. palposa* Fedoseeva, *M. rohdendorfi* Fedoseeva, *M. triangulina* Fedoseeva, *M. variegata* Meigen. In this group *M. bohémica* Fedoseeva and *M. femorata* Macquart are the most common and abundant in Central Europe.

8b. *M. virescens* von Roser - a halophilous species with a local distribution in Europe, associated with saline habitats. It is known from localities in Germany, Romania, and the south part of European Russia.

8c. Many species (16) have rather local distributions. It is possible to distinguish within them three groups of species: species of northern distribution, species with southern distribution and some species with an intermediate distribution. Three species, *M. elbergi* Fedoseeva, *M. lidiae* Nartshuk and *M. zimzerla* Nartshuk are known from Scandinavia, Baltic countries and North-West Russia (Fig. 5). *M. rostratra* Hubicka has a similar distribution, but is also recorded further south - in Poland. *M. eduardi* Hubicka is known from Lithuania and Poland, and *M. rotundata* Hubicka only from Poland. Another group of species *M. athletica* Fedoseeva, *M. balcanica* Beschovski, *M. facialis* Fedoseeva, *M. hungarica* Dely-Draskovits, *M. obtusa* Peterfi, *M. pleurosetosa* Beschovski, *M. quadrimaculata* Fedoseeva, *M. rufa* Fedoseeva are distributed in central and southern parts of Europe. Only one species *M. hispaniae* Fedoseeva is known from the western part of Europe (Spain and England), but I have some new species from the Iberian Peninsula. The local distribution of many species seems to be explained partly by an insufficient level of recording. Currently there is no up to date data on the *Meromyza* of West and South Europe (Spain, France, South Italy, Greece). On the other hand the local distribution of host-plants may be responsible for the local distribution of some *Meromyza* species.

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