The Larva of *Metanoea rhaetica* Schmid, 1955 (Trichoptera: Limnephilidae: Drusinae) from a Small Austrian Mountain Brook

by

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INTRODUCTION

Of the 17 members of the subfamily Drusinae recorded in Austria (Malicky 1975 and personal communications), two species belong to genus *Metanoea*: *M. rhaetica* Schmid 1955 and *M. flavipennis* Pictet 1834. Both are endemics of the Alps. Within this region, they show a very distinct distribution pattern, with *M. rhaetica* inhabiting the eastern and *M. flavipennis* the western part of the Alps. While the larva of *M. flavipennis* is still unknown, larvae and pupae of an unknown Drusinae species were collected recently from a small mountain brook near Lunz, Lower Austria, reared to the adult stage and identified as *M. rhaetica*.

Of the other Drusinae recorded in Austria, larvae of seven species are included in the key of Szczesny (1978): *Drusus annulatus* (Stephens 1837), *D. biguttatus* (Pictet 1834), *D. discolor* (Rambur 1842), *D. monticola* McLachlan 1876, *D. trifidus* McLachlan 1868, *Ecclisopteryx dalecarlica* Kolenati 1848 and *E. madida* (McLachlan 1867). Keys to *D. annulatus* and *Ecclisopteryx*...
clisopteryx guttulata (Pictet 1834) are in papers of Hiley (1976) and Wallace (1980), and a description of the latter species is also given by Nielsen (1942). The larva of Anomalopterygella chauviniana (Stein 1874) (together with the larvae of D. discolor, D. rectus Mclachlan 1848 and E. guttulata) has been described and illustrated by Décamps & Pujol (1975). The findings of Szczesny, Décamps & Pujol and Nielsen have been used for the Drusinae key of Sedlák (1980), which is the most complete key for Central European Drusinae larvae, including 9 species recorded in Austria. The larvae of Cryptothrix nebulicola McLachlan 1867, Drusus chrysotus (Rambur 1842), D. destitutus (Kolenati 1848), D. franzi Schmid 1956, D. noricus Malicky 1981, Ecclisoteryx asterix Malicky 1979 and Metanoea flavipennis are unknown.

**SEPARATION OF LARVAL DRUSINAE**
from other Trichoptera

Keys for identification of Trichoptera larvae to family level are in a number of papers, e.g. Bertrand (1954), Hickin (1967) and Lepneva (1970). For most of the following accounts, the family key of Sedlák (1980) has been used. The following combination of morphological features distinguishes limnephilid larvae from all other Trichoptera: construction of portable cases; lateral abdominal fringe present; first abdominal segment with three fleshy protuberances (two laterally, one dorsally); prosternal horn present; pro- and mesonotum totally, metanotum partially sclerotized; mesonotum divided by a single longitudinal suture; abdomen round, not flattened.

Drusinae can be separated from other limnephilid larvae by the following features: metanotum with three pairs of sclerites separates Drusinae from Apataniinae; all gills consist of single filaments only separates Drusinae from Dicosmoecinae and Limnephilini; in all known Drusinae larvae, the anterior third of the pronotum lacks a distinct transverse rim, which is present in all known larvae of Limnephilini, Chaetopterygini and Stenophylacini (e.g., Fig. 1g) (only a slight concavity may be present in Drusinae larvae as shown in Figs. 2a-d).

**Fig. 1.-a-e:** Metanoea rhactica. a: head capsule, dorsal view; b: head capsule, lateral view; c: left side of head and pronotum; d: first abdominal sternum; e: pupal case. f: Drusus biguttatus, first abdominal sternum. g: Potamophylax cingulatus (last instar larva), left side of pronotum; the arrow indicates the transverse rim at the anterior third. Scale lines are 1 mm.
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Fig. 2: Shape of larval pronotum (left side). A: Drusus discolor; B: Ecclisopteryx dalecarlica; C: Drusus biguttatus; D: Drusus triditus; E: Metanoea rhaetica; F: Drusus carpathicus; G: Drusus annulatus; H: Drusus monticola; I: Ecclisopteryx madida; J: Ecclisopteryx guttulata; K: Anomalopterygella chauviniana; L: Drusus brunneus. Figures A-D, F-I, L from Szczesny (1978), Figure J after Nielsen (1942), Figure K after Déamps & Pujol (1975), Figure E present paper. Scale line is 1 mm.

KEY to the larva of *Metanoea rhaetica*

An attempt is made to include the larva of *M. rhaetica* in the key of Szczesny (1978) by adding the couplet designated 8a and 8b:

8 (9) Gills on the dorsal side of abdomen present

8a (8b) First abdominal sternum with a large sclerotized patch with bears numerous (30-40) black setae (Fig. 1d) .................................. *Metanoea rhaetica*

8b (8a) First abdominal sternum without large sclerotized patch (small patches may be present at the base of single setae; Fig. 1f) .................................. *Drusus biguttatus*

9 (8) No gills on the dorsal side of abdomen ............................................ *Drusus carpathicus*

In couplets 1-7 of Szczesny’s key, *M. rhaetica* is clearly separated from *Drusus discolor* (the latter is covered with a thick woolly layer of hairs on head and pronotum), and *Ecclisopteryx dalecarlica* and *Drusus triditus* (both have spines on head and pronotum; in *M. rhaetica*, only setae are present). In couplet 10-16, *Drusus brunneus* Klapálek 1898, *Ecclisopteryx madida*, *Drusus*
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annulatus and D. monticola are identified by the shape of the pronotum (Fig. 2g-i, 21), which is useful also for Anomalopterygella chauviniana and E. guttulata (Fig. 2j-k).

DESCRIPTION of the final instar larva

Material examined: exuviae of 8 ♂, 3 ♀ laboratory reared pupae or adults and of 3 ♂, 2 ♀ field collected pupae, and 14 last instar larvae, all from a channel of Upper Seebach in the so-called Länd at Lunz, Lower Austria.

Mean body length 8.0 mm (range 7.2-9.0 mm), mean head width 1.0 mm (range 0.9-1.1 mm). Larval case curved, conical in shape, made of mineral particles; particle size increases towards front opening of case which is 7-9 mm long. Pupal case (Fig. 1e) similar in shape but 9-11 mm long; its posterior part attached to stones.

Head capsule dark brown or medium brown, almost round, its largest diameter between eyes. Conical base of antenna on a short ridge, another ridge extends from anterior border of head to base of antenna (Fig. 1a, b). Chaetotaxy of head of M. rhaetica agrees with Drosus biguttatus, D. carpathicus and D. annulatus.

In profile, dorsal line of pronotum evenly rounded in its posterior third (Fig. 1c). A little posterolateral hump present. Dark brown pronotal surface covered by black setae.

Anterior and posterior faces of all femora covered by short setae: 5-6 setae on hind femur, 10-12 on middle and 5-11 on first femur, which has also five yellow spurs on its ventral margin.

Lateral fringe present on last third of second abdominal segment, extending to first third of eight segment.

Dorsal and ventral gills always present in varying number, but dorsolateral and ventrolateral gills lacking. Dorsal gills at most from second (postsegmental position) to sixth segment (postsegmental position), ventrals gills at most from second (postsegmental position) to seventh segment (presegmental position).

M. rhaetica seems to be morphologically close to Drosus biguttatus, D. trifidus and D. carpathicus.

HABITAT AND DISTRIBUTION

Last instar larvae, prepupae and pupae of M. rhaetica were found on June 4th, 1984. All were attached to edges of large stones in a fast-flowing channel supplying a small power station in the so-called Länd at Lunz with water of the Upper Seebach. Seebach is a clean, calcareous mountain brook with low temperatures (annual range 4-8°C). The locality is situated ca. 650 m above sea level (47°50’ N, 15°04’ E). According to Tobias (1981), M. rhaetica is restricted to small mountain brooks in the higher region of the Alps. In Austria, the species is reported from many localities in Lower and Upper Austria, Styria, Carinthia, Salzburg, from Tyrol and Vorarlberg and Vorarl-
In the Western Alps, the species is superseded by *M. flavipennis*, which is reported from one location in Tyrol only (Malicky, 1975, and personal communication). In suitable localities, *M. rhaetica* seems to be abundant. Adults fly from June to October, but most frequently in August and the first half of September (Malicky 1980).

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