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Larwy podrodziny *Drusinae (Insecta: Trichoptera)* polskiej części Karpat

Larvae of the subfamily *Drusinae (Insecta: Trichoptera)* from the Polish part of the Carpathian Mts

Wpłynęło 12 maja 1976 r.

Abstract — A key for separation of *Drusinae* larvae occurring in the Polish part of the Carpathian Mts is presented. It includes the hitherto known larvae of the species, *Drusus annulatus* (Steph.), *D. biguttatus* (Pict.), *D. discolor* (Ramb.), *D. trifidus* McLach., and *Ecclisopteryx madida* McLach. as wel as the larvae of the species *Drusus brunneus* Klap., *D. carpathicus* Dz., *D. monticola McLach.*, and *Ecclisopteryx guttulata dalecarlica* Kol. not known up to date. The most important diagnostic characters which can be used in their separation are figured. Some taxonomic, zoogeographical, and ecological remarks on the species living in the Polish part of the Carpathian Mts are given.

According to the data found in literature (Tomaszewski 1965) up to the year 1965, 11 species of caddis-flies of the subfamily *Drusinae* were reported from the Carpathian region within the present borders of Poland. Later on further two species of genus *Drusus* were found (Riedel 1966, Szczęsny 1966a, Szczęsny 1966b). According to the opinion of *Botosaneanu* (1967) from among 13 species reported for this region, three i.e. *Drusus destitutus* (Kolenati 1848), *D. mixtus* (Pictet 1834), and *Ecclisopteryx guttulata guttulata* (Pictet 1834) do not occur in the Carpathians. Unpublished data of the present author, based on numerous material of the *Drusinae* collected at many stations of the Polish Carpathian Mts, support this opinion since no specimens of these three species were found there. Incorrect data about the occurrence of *Drusus muelleri* McLachlan, 1868, in the Tatra Mts (Tomaszewski 1965, Botosaneanu 1967, if the author was basing on Toma-

szewski's data), in the area of Mt Babia Góra (Sowa, Szczęsny 1970), and in the river basin of the Raba (Szczęsny 1975) should be corrected. Having verified the original material the author found that in reality these data refer to females of *D. discolor* (Rambur 1842), whose correct illustrations can be found in Kumanski's paper (1973), while the larvae from the Raba river basin (Szczęsny 1975) assumed to be of the species *D. muelleri*, belonged to the species *D. brunneus* Klapalek, 1898. The corrected list of species includes, *Drusus annulatus* (Stephens 1837), *D. biguttatus* (Pictet 1834), *D. brunneus* Klapalek, 1898, *D. carpathicus* Dzięddzielewicz, 1911, *D. discolor* (Rambur 1842), *D. monticola* McLachlan, 1876, *D. trifidus* McLachlan, 1868, *Ecclisopteryx guttulata dalecarlica* Kolenati, 1848, *E. madida* (McLachlan 1867).

Most probably the above-mentioned species do not complete the list of all *Drusinae* of the Polish part of the Carpathian Mts. It might e.g. be increased by *Drusus döhleri* Mayer, 1936, in the Tatra Mts, though the status of this species seems doubtful. Since August 9, 1933, when some specimens found in the Slovak part of the Tatras at the altitude of 2010 m served for the description of this species (Mayer 1936), it has not been found any more.

From among the above-mentioned species *D. annulatus* (Hanna 1961), *D. biguttatus*, *D. discolor*, and *D. trifidus* (Ulmer 1909, Lestage 1921) as well as *E. madida* (Botosaneanu 1959) have so far been known in the larval stage; the subspecies *E. guttulata guttulata* is also known in this larval stage (Nielsen 1942, Hiley 1970).

The most important diagnostic character for separation of *D. brunneus*, *D. carpathicus*, *D. monticola*, and *E. guttulata dalecarlica* are presented here for the first time. The identity of *D. brunneus*, *D. carpathicus*, and *E. guttulata dalecarlica* has been confirmed by identification of larval fragments and fragments of the already developed genital organs of the male, preserved in the same pupal cases. With regard to *Drusus monticola* the identity of the larva has still to be confirmed, as it was influenced by the co-occurrence of larvae not known to the author yet with adults of the species, in the same zone of the streams.

Key for the separation of *Drusinae* larvae in the Polish part of Carpathian Mts

1 (2) Head and pronotum covered with thick woolly layer of hairs (figs 10, 12, 14) . . . . . *D. discolor* (figs 1, 10—15).

2 (1) Head and pronotum without a thick woolly layer of hairs.

3 (10) Pronotum from the dorsal side with a convexity of regularly rounded shape as in figs 1—5.

4 (7) On head and pronotum spines present.

5 (6) Head and pronotum yellow, shiny; spines and bristles on head and pronotum black, very numerous (figs 16—18) . . . . . *E. guttulata dalecarlica.*

6 (5) Head and pronotum black-brown, mat; spines bright, not numerous on the head (figs 19—20), on pronotum numerous (fig. 21); bristles on head and pronotum not numerous "in the normal number" (figs 19—21) . . . . . *D. trifidus* (also *D. döhleri*?).

7 (4) No spines on head and pronotum.

8 (9) Gills on the dorsal side of abdomen present (figs 22—24) . . . *D. biguttatus.*

9 (8) No gills on the dorsal side of abdomen (figs 25—27) . . . . . *D. carpathicus.*

10 (3) Pronotum from the dorsal side with a differently shaped convexity (figs 6—9).

11 (12) Convexity on pronotum of the shape of a crease of two sharp brims anterior and a posterior one (figs 9, 30); anterior brim of the crease reaches the anterior edge of pronotum (figs 9, 30); no spines on head and pronotum (figs 28—30) . . . . . *D. brunneus.*

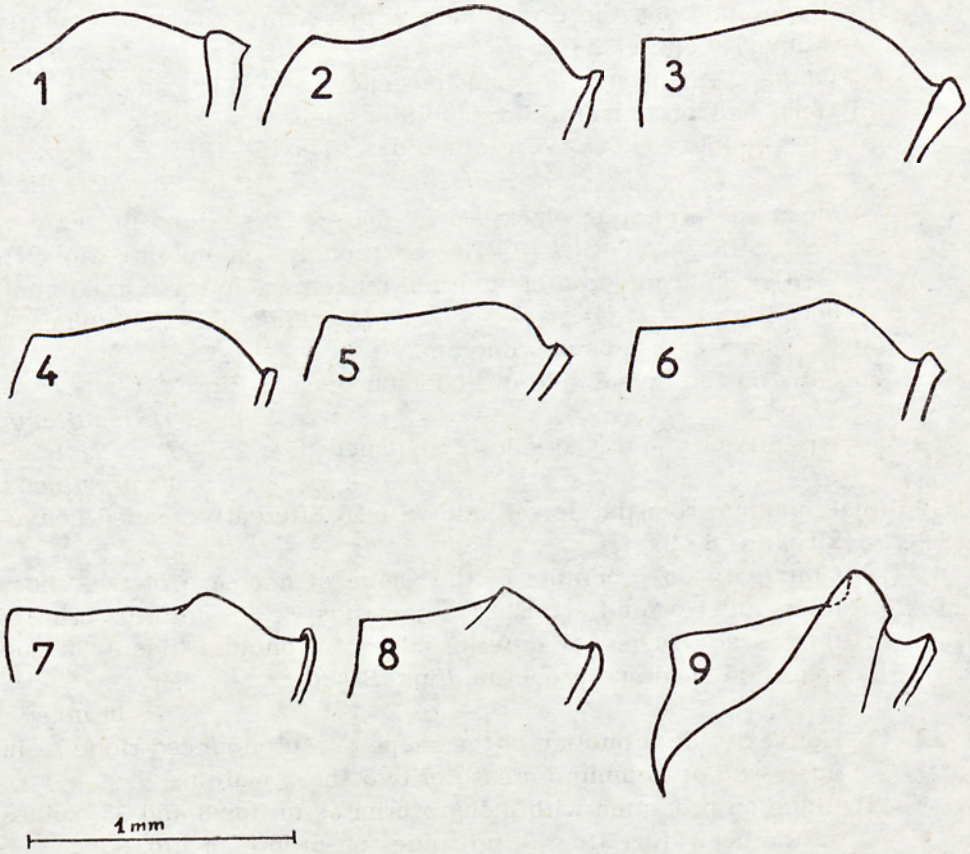
12 (11) Convexity on pronotum of the shape of a pronounced ridge as in figs 6—8 not forming a crease of two sharp margins.

13 (14) Ridge on pronotum with a sharp brim as in figs 8 and 33; spines on the head (figs 31—32), no spines on pronotum (fig. 33) . . . *E. madida.*

14 (13) Ridge on pronotum without a sharp margin (figs 6—7).

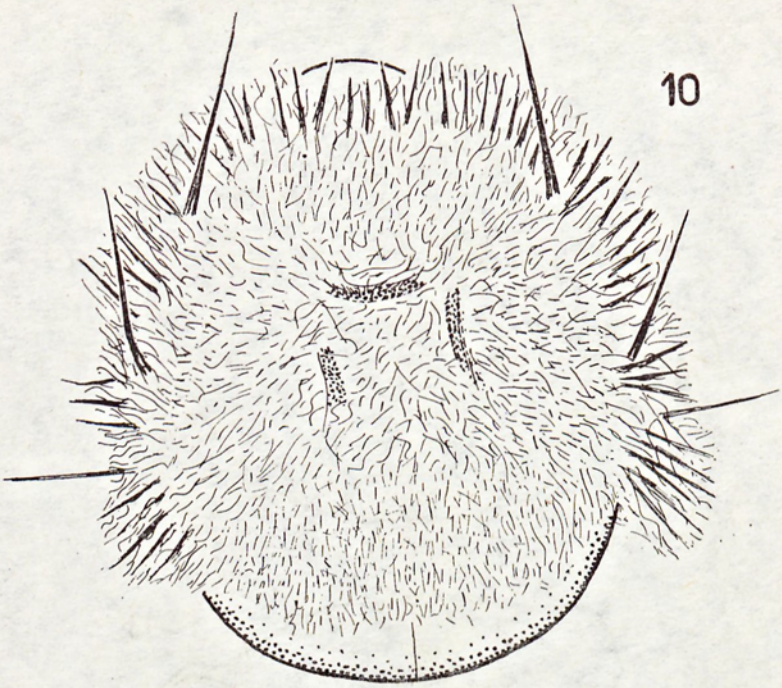
15 (16) Ridge on pronotum as in figs 6 and 38; from the frontal side head almost flat (fig. 34), on head and pronotum usually visible spots (figs 34, 16, 38); the first abdominal segment from the ventral side as in fig. 40 . . . . . *D. annulatus.*

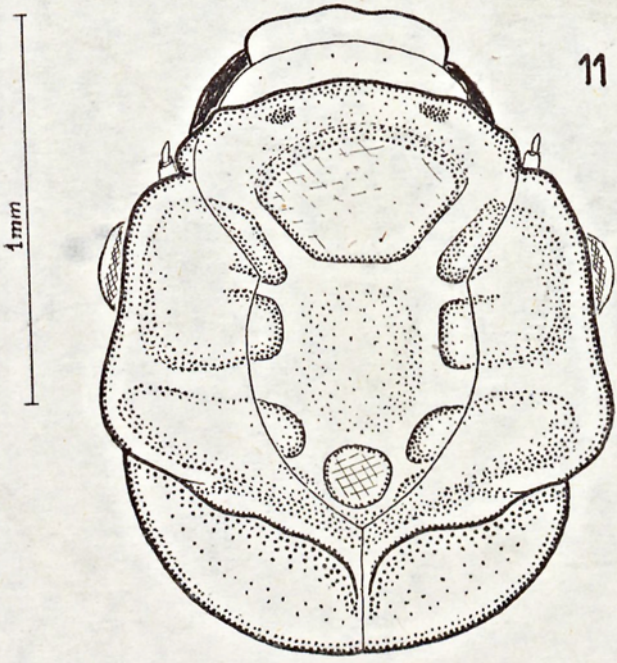
16 (15) Ridge on pronotum as in figs 7 and 39; head from the frontal side slightly convex without spots (figs 35 and 37); the first segment of abdomen from the ventral side as in fig. 41 . . . . . *D. monticola.*



Ryc. 1-9. Kształt pronotum larwalnego:

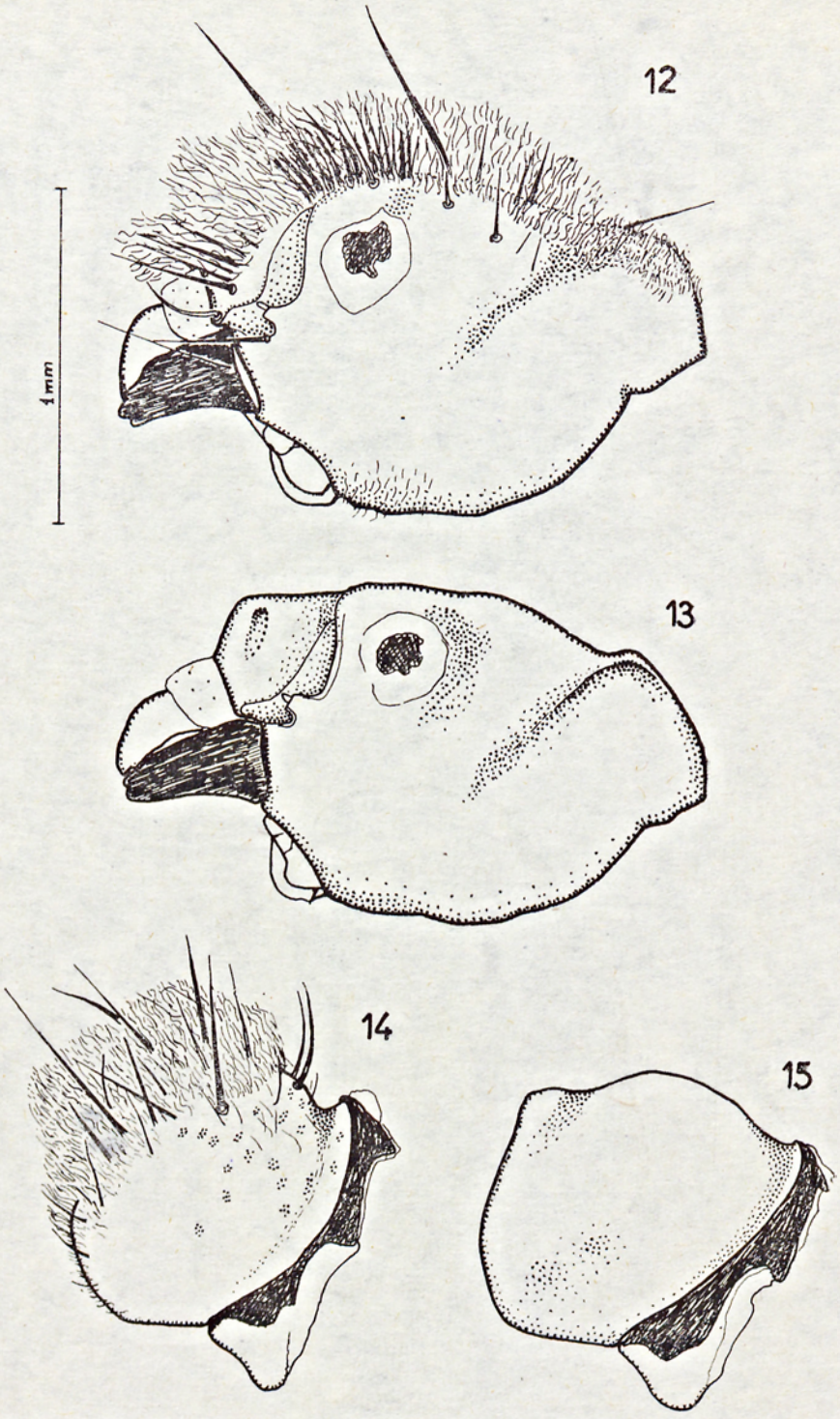
Figs. 1-9. Shape of the larval pronotum: 1 — *Drusus discolor*; 2 — *Ecclisopteryx guttulata dalecarlica*; 3 — *Drusus biguttatus*; 4 — *D. trifidus*; 5 — *D. carpathicus*; 6 — *D. annulatus*; 7 — *D. monticola*; 8 — *Ecclisopteryx madida*; 9 — *Drusus brunneus*





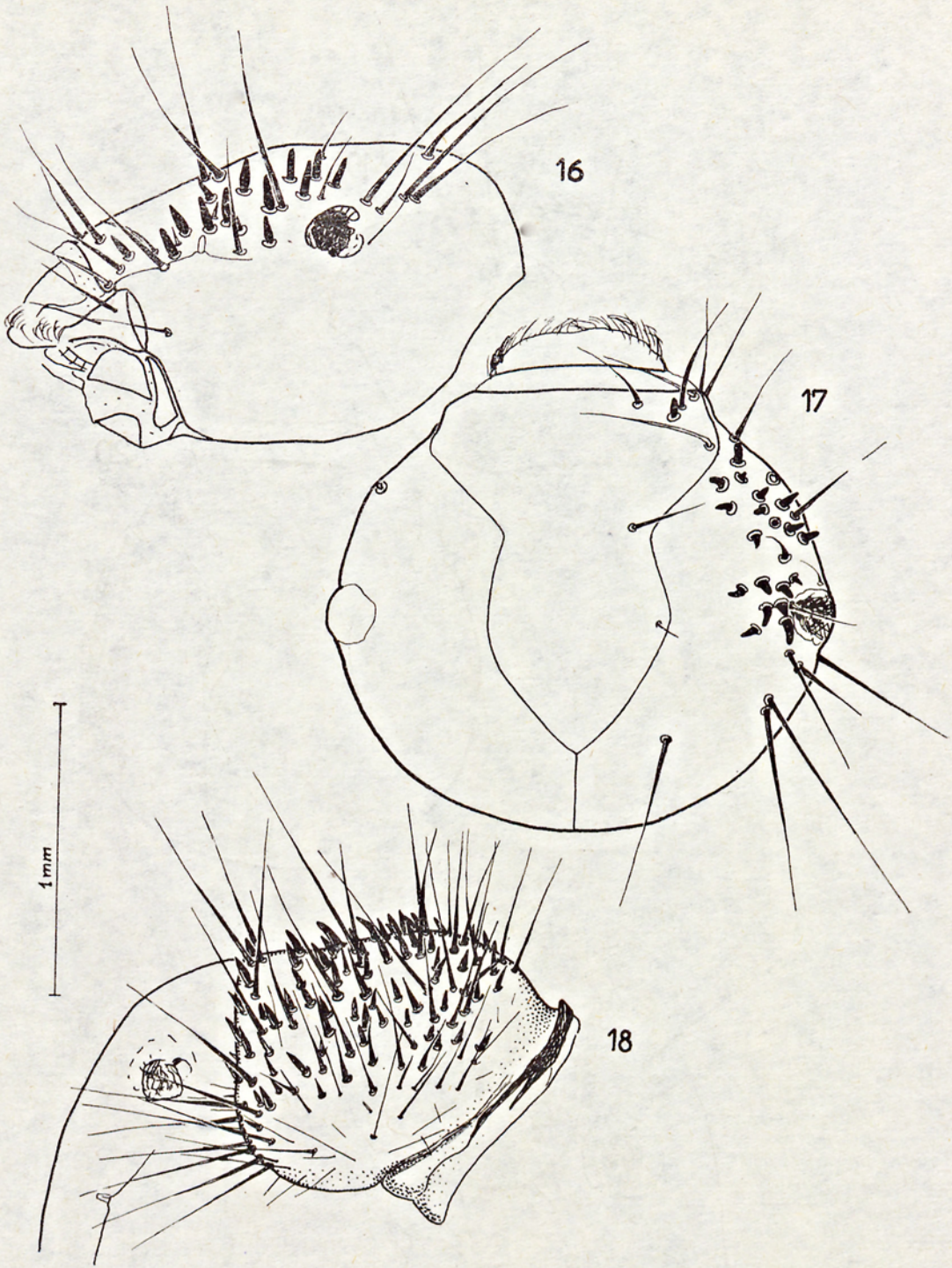
Ryc. 10-11. *Drusus discolor*, głowa larwy od strony grzbietowej. 10 — z włoskami; 11 — bez włosków

Figs. 10-11. *Drusus discolor*, head of the larva, dorsal view. 10 — with hairs; 11 — without hairs



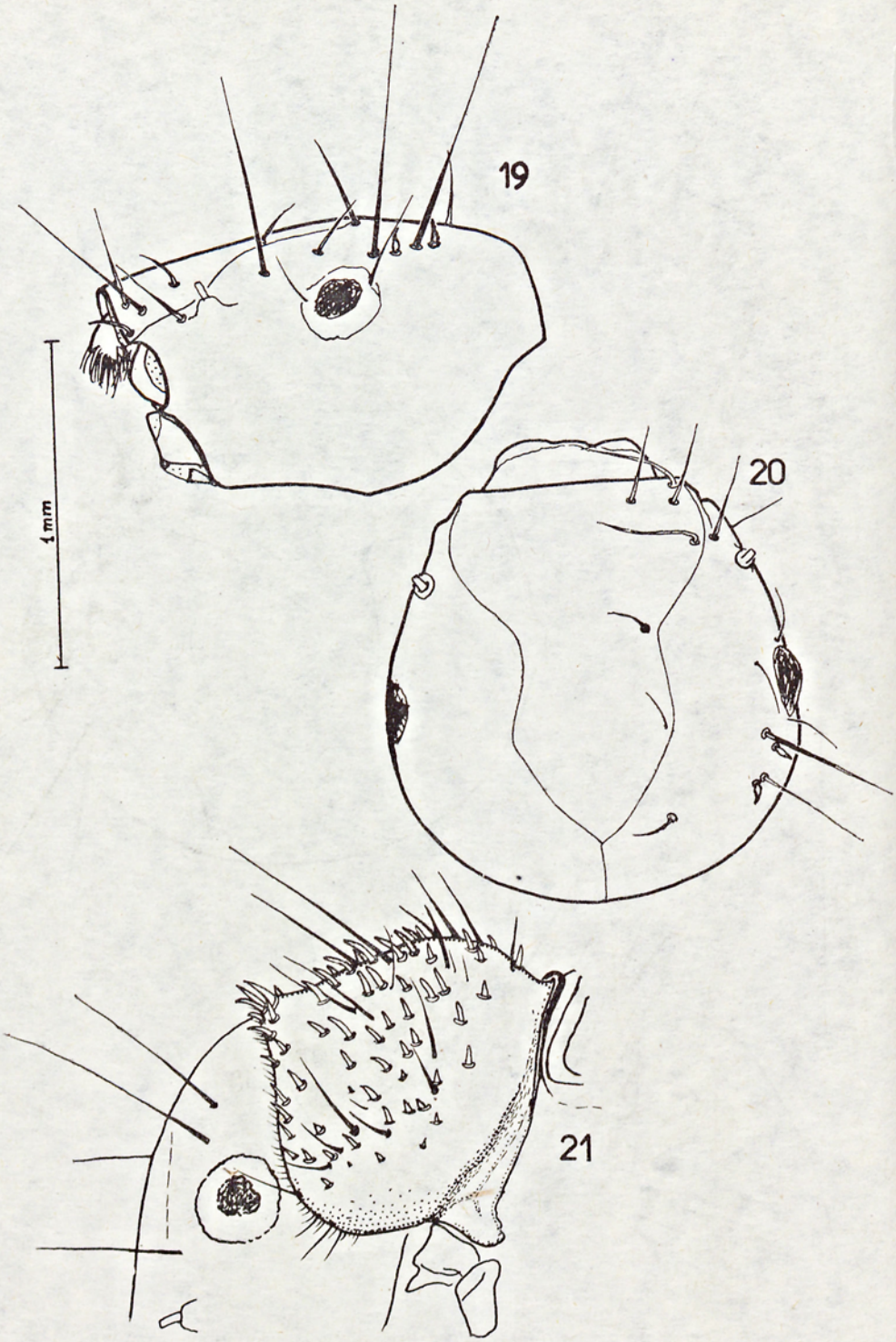
Ryc. 12-15. *Drusus discolor*, głowa i pronotum larwy od strony bocznej. 12, 14 — z włoskami ;13, 15 — bez włosków

Figs. 12-15. *Drusus discolor*, head and pronotum of the larva, lateral view. 12, 14 — with hairs; 13, 15 — without hairs



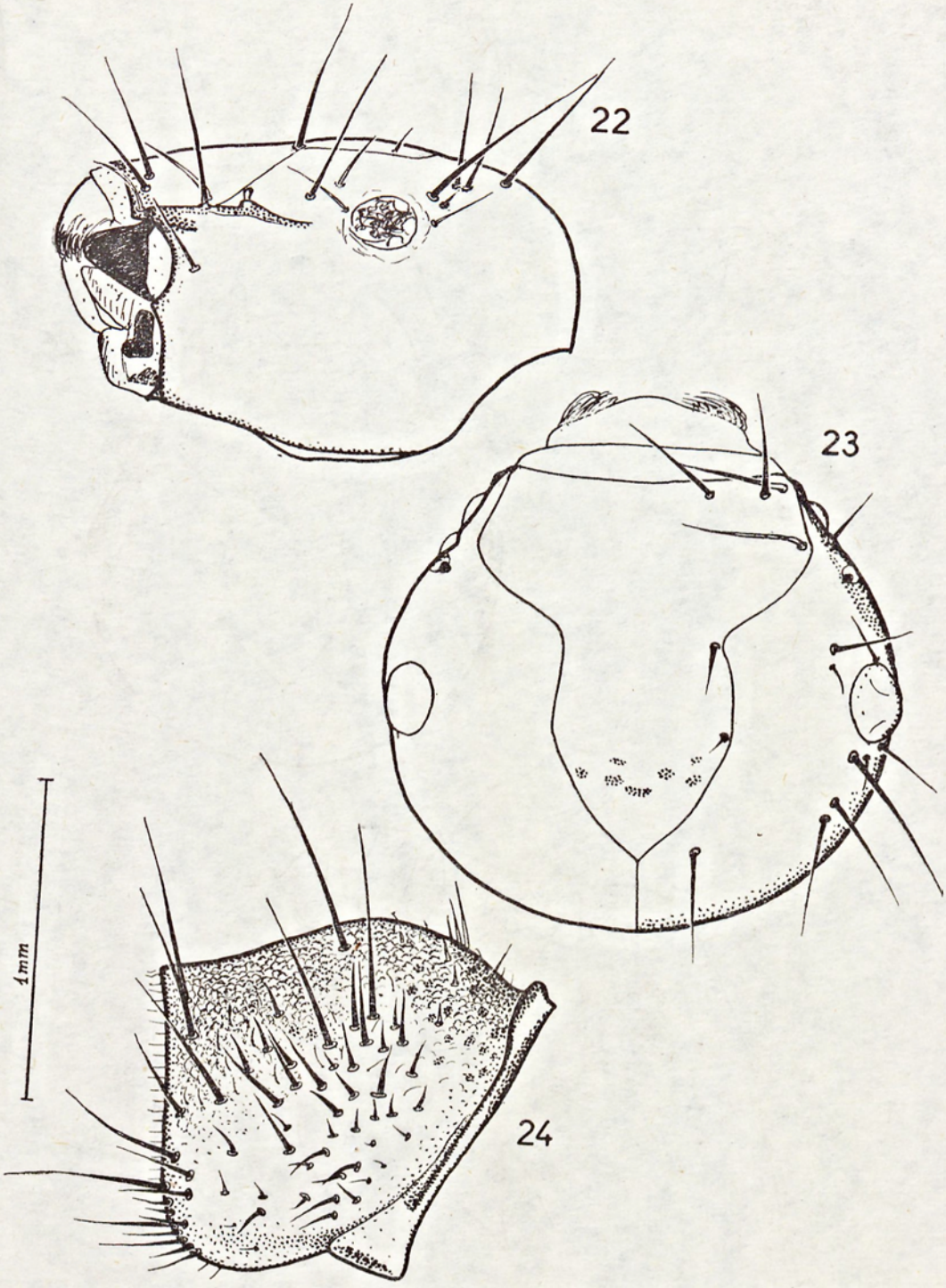
Ryc. 16-18. *Ecclisopteryx guttulata dalecarlica*, głowa i pronotum larwy. 16, 18 — od strony bocznej; 17 — od strony grzbietowej

Figs. 16-18. *Ecclisopteryx guttulata dalecarlica*, head and pronotum of the larva. 16, 18 — lateral view; 17 — dorsal view



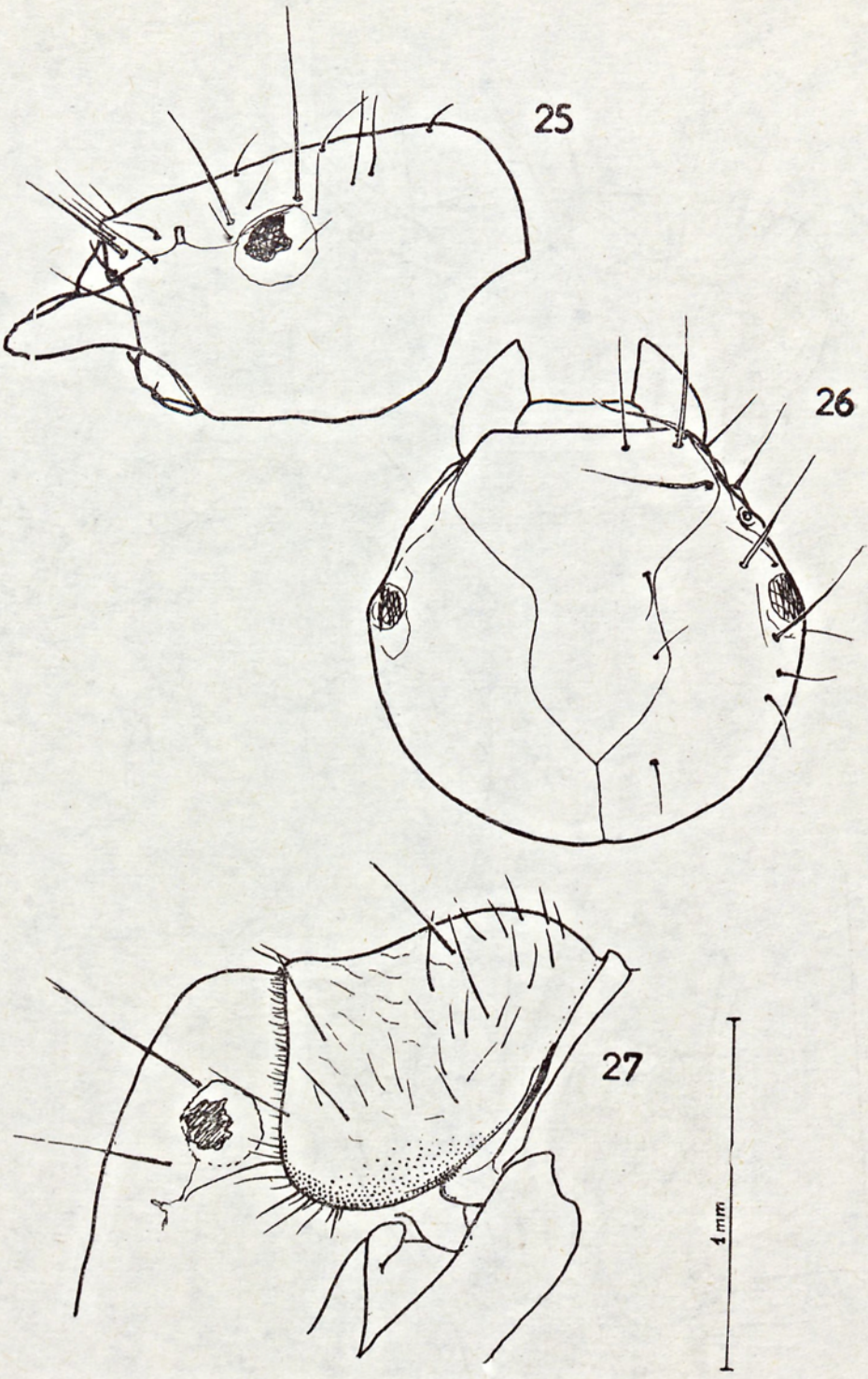
Ryc. 19-21. *Drusus trifidus*, głowa i pronotum larwy. 19, 21 — od strony bocznej; 20 — od strony grzbietowej

Figs. 19-21. *Drusus trifidus*, head and pronotum of the larva. 19, 21 — lateral view; 20 — dorsal view



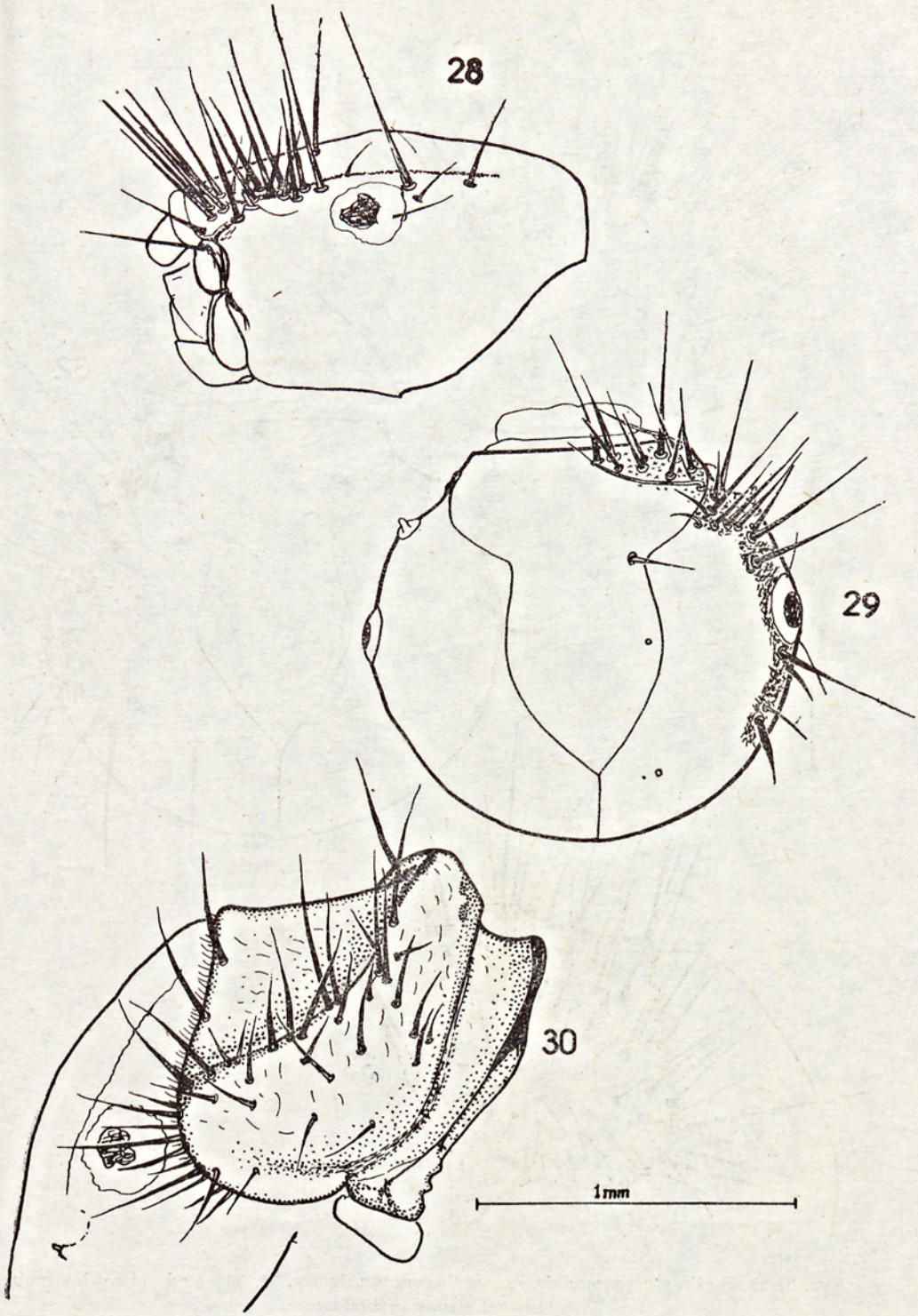
Ryc. 22-24. *Drusus biguttatus*, głowa i pronotum larwy. 22, 24 — od strony bocznej; 23 — od strony grzbietowej

Figs. 22-24. *Drusus biguttatus*, head and pronotum of the larva. 22, 24 — lateral view; 20 — dorsal view



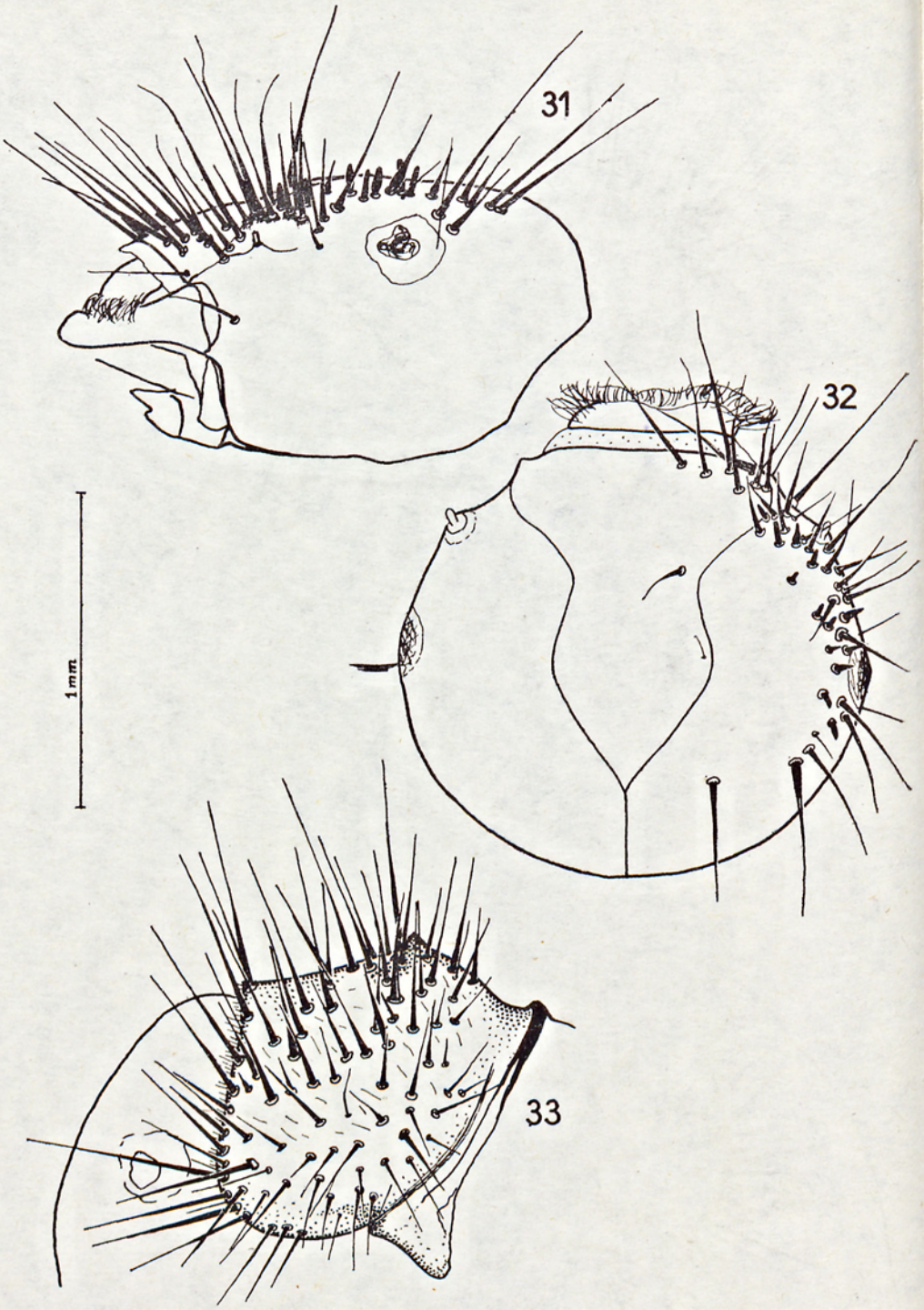
Ryc. 25-27. *Drusus carpathicus*, głowa i pronotum larwy. 25, 27 — od strony bocznej, 26 — od strony grzbietowej

Figs. 25-27. *Drusus carpathicus*, head and pronotum of the larva. 25, 27 — lateral view; 26 — dorsal view



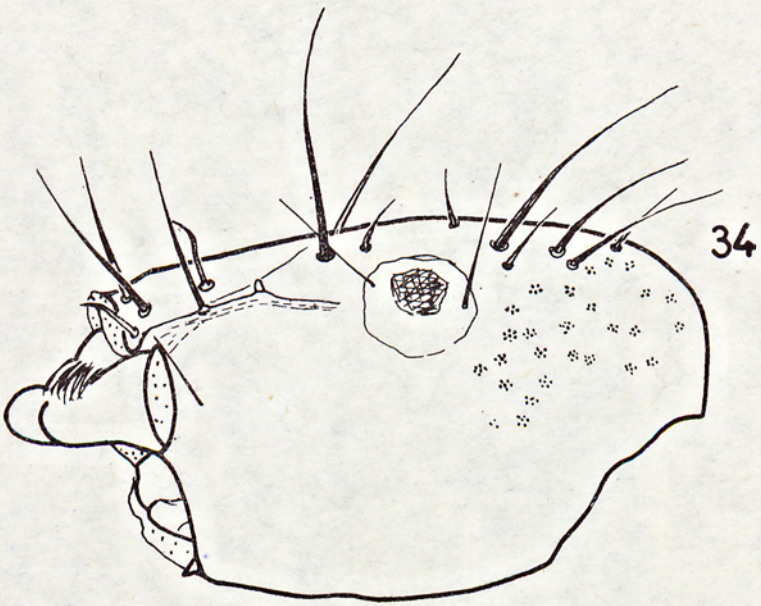
Ryc. 28-30. *Drusus brunneus*, głowa i pronotum larwy. 28, 30 — od strony bocznej; 29 — od strony grzbietowej

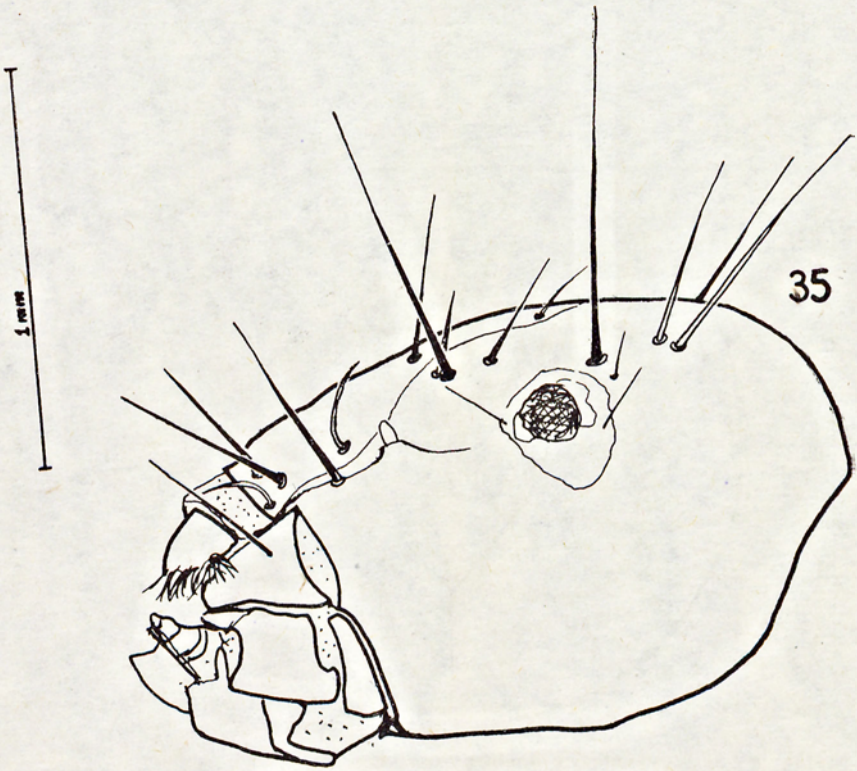
Figs. 28-30. *Drusus brunneus*, head and pronotum of the larva. 28, 30 — lateral view; 29 — dorsal view



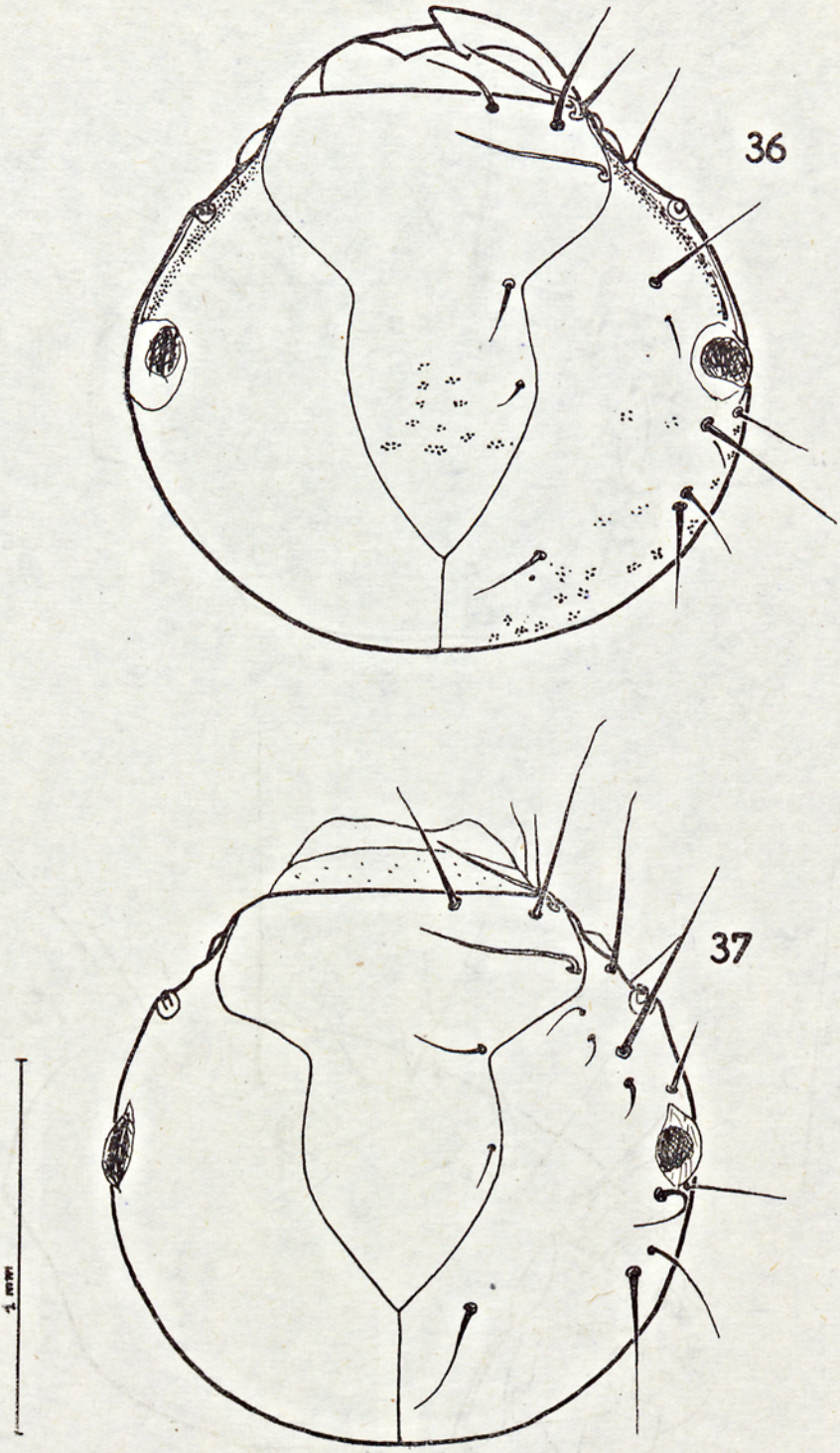
Ryc. 31-33. *Ecclisopteryx madida*, głowa i pronotum larwy. 31, 33 — od strony bocznej; 32 — od strony grzbietowej

Figs. 31-33. *Ecclisopteryx madida*, head and pronotum of the larva. 31, 33 — lateral view; 32 — dorsal view

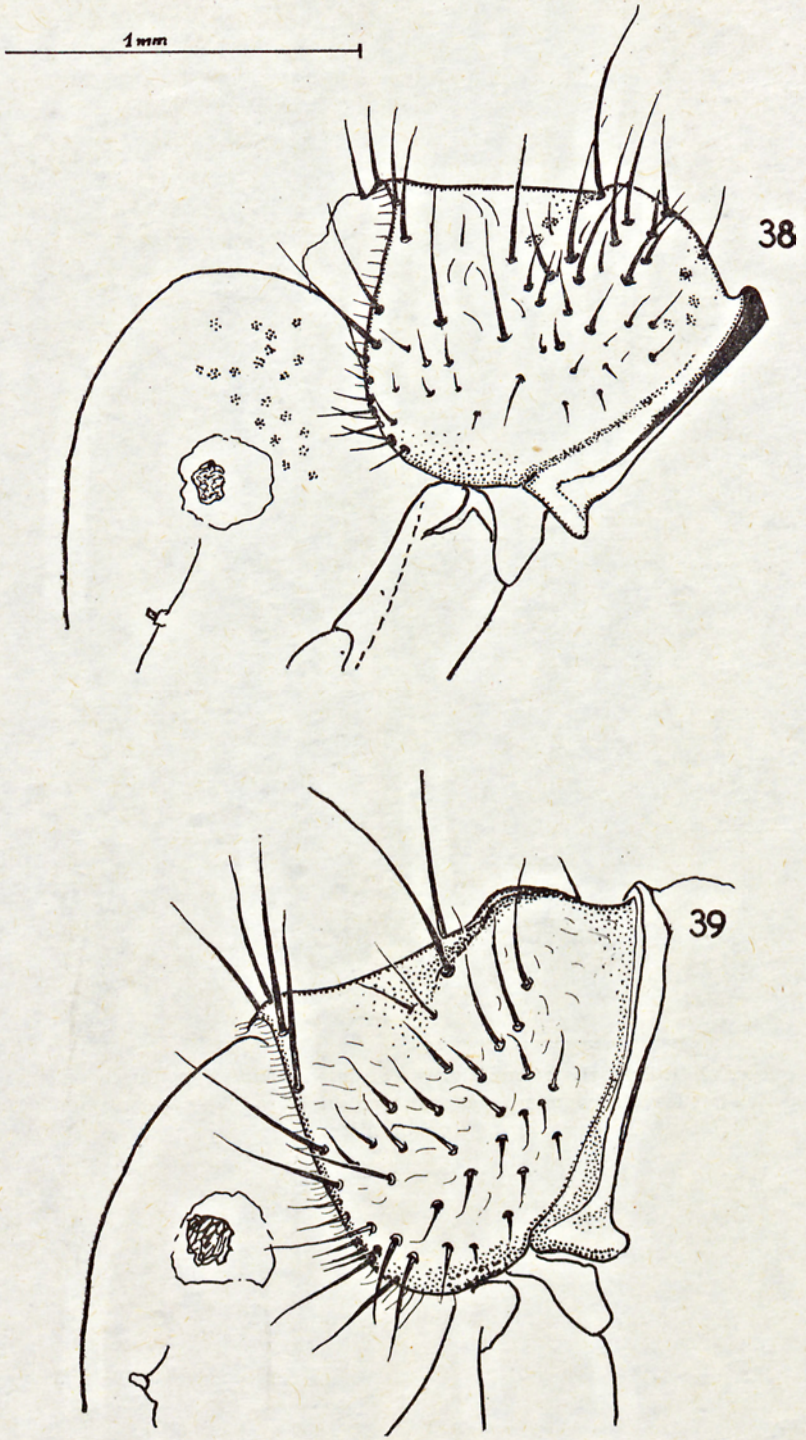




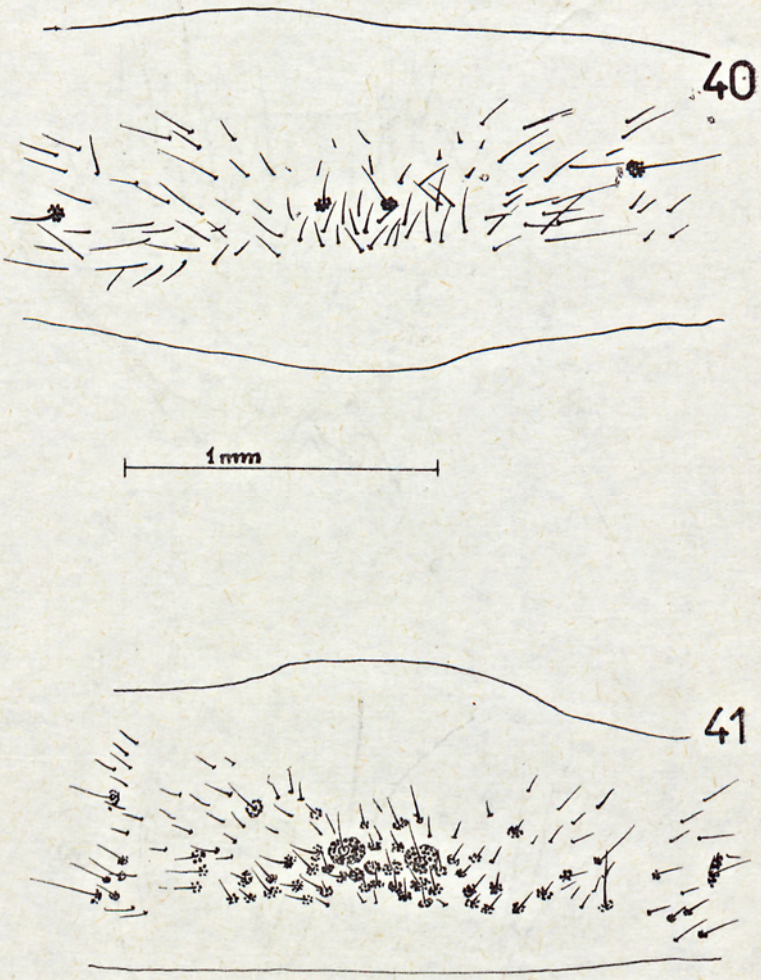
Ryc. 36-37. Głowy larw od strony bocznej
Figs. 34—35. Larval heads, lateral view. 34 — *Drusus annulatus*; 35 — *D. monticola*



Ryc. 36-37. Głowy larw od strony grzbietowej
Figs. 36-37. Larval heads, dorsal view. 36 — *Drusus annulatus*; 37 — *D. monticola*



Ryc. 38-39. Pronotum larwalne od strony bocznej
Figs. 38-39. Larval pronotum, lateral view. 38 — *Drusus annulatus;* 39 — *D. monticola*



Ryc. 40-41. Brzuszna strona pierwszego larwalnego segmentu abdomenu
Figs. 40-41. First larval abdominal segment, ventral view. 40 — *Drusus annulatus*; 41 — *D. monticola*

A comparison of the shapes of the larval pronotum within the genus *Drusus* supplies new phylogenetic data on certain species of this genus; *D. brunneus* e.g. should not be included in one species group with *D. biguttatus* and *D. trifidus* as it was done by Schmid (1956), since its larva has a differently developed pronotum as compared with the larvae of *D. biguttatus* and *D. trifidus*, which in turn, in this respect resemble the *D. carpathicus* larvae, a species phylogenetically more remote from them.

When comparing the shapes of the pronotum in the larvae of the genus *Ecclisopteryx*, it will be noticed that the larvae of the two "closely" related subspecies *E. guttulata guttulata* and *E. guttulata dalecarlica* (Schmid 1956) have it differently developed: the pronotum of the former has a ridge with a sharp brim (Nielsen 1942, Hiley 1970), while that of the latter has a regularly oval convexity. The existence of these features suggests that the two larval forms most probably belong to different species. This so differently developed pronotum of *E. guttulata dalecarlica* caused the author to make a mistake when he initially classified the separated larvae of this species among the *D. biguttatus* (Szczęsny 1975), believing that the only pronotum having a ridge with sharp brim was the distinctive feature of the genus *Ecclisopteryx* (Lepneva 1966); this was namely the trait that characterized the larvae of this genus *(guttulata* and *madida)* known till then.

The *Drusinae* larvae live mainly in cold and very cold running waters. They can most frequently be found in spring regions and spring brooks (crenon) and in upper sectors of the streams (epirhithron), where they constitute an important element in the bottom invertebrates. In greater mountain streams *E. madida, E. guttulata dalecarlica, D. biguttatus* (only in streams at the foot of the Tatra Mts), and sometimes *D. annulatus* are found in places of a moderately rapid water current and *D. discolor* in these where it is impetuous.

The larvae of *Drusinae* live in cylindrical cases built of sand-grains. It is only *D. discolor* which has a differently constructed case; in an older age phase its larva builds a case of mixed material with the prevalence of plant particles, but the main mass of the constructive element consists of secretion substance. Moreover, this case is provided with loosely attached vegetable fragments, this being not observed with larvae of other species discussed.

The hitherto existing data suggest that the species in question chiefly live in mountainous regions of Central and Southern Europe. Some of them populate small regions, confined to upper mountain zones, e.g. *D. monticola* or *D. brunneus*, or occur at stations isolated on particular mountain ranges; e.g. *D. carpathicus* and *D. brunneus* are Carpathian endemites. However, some others are found not only in the mountains but also out of them, such are *Ecclisopteryx guttulata dalecarlica, Drusus annulatus*, and *D. trifidus*.

STRESZCZENIE

Opracowano klucz do larw *Drusinae* występujących w polskiej części Karpat, obejmujący znane dotychczas larwy gatunków: *Drusus annulatus* (Steph.), *D. biguttatus* (Pict.), *D. discolor* (Ramb.), *D. trifidus* McLach. i *Ecclisopteryx madida* McLach. oraz dotychczas nieznane larwy gatunków: *Drusus brunneus* Klap., *D. carpathicus* Dz., *D. monticola* McLach. i *Ecclisopteryx guttulata dalecarlica* Kol. Najważniejsze cechy odróżniające poszczególne larwy zobrazowano rycinami. Pracę uzupełniają uwagi taksonomiczne, zoogeograficzne i ekologiczne o gatunkach wymienianych z polskiej części Karpat.

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