

The larva of *Anabolia anatolica* Sipahiler, 2001 (Trichoptera, Limnephilidae)

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Abstract

In this study the unknown larva of *Anabolia anatolica* Sipahiler, 2001 is described and illustrated. The features of the pupal exuviae are also given. *A. anatolica* is a relict species found in southern Turkey, the relatives, *A. laevis* Zetterstedt, 1840 and *A. furcata* Brauer, 1857 are found in northern and eastern part of Europe. The larva of *A. anatolica* close to the larva of *A. laevis* by dark coloured anterior edge of the frontoclypeus and differs from both larvae by the shape of the pattern found in the middle of the pronotum.

Key words: *Trichoptera*, *Limnephilidae*, *Anabolia anatolica*, immature stages.

Introduction

Anabolia anatolica Sipahiler, belonging to *nervosa* species group of the genus *Anabolia*, is a relict species with Pleistocene origin, found only one spring in southern Turkey in the northern slopes of the Taurus Mountains (Sipahiler 2001). Within the *nervosa* group (Schmid 1950) five species are found, four species, *A. lombarda* Ris, 1897, *A. laevis* Zetterstedt, 1840, *A. furcata* Brauer, 1857 and *A. anatolica* Sipahiler, 2001 are recognized, in having deep excision on the preanal appendages of the adults, which is not found in *A. nervosa* Curtis, 1834. Among them, *A. nervosa* is widely distributed in western Europe and *A. lombarda* has a restricted area in Italy. *A. laevis* is the close related species of *A. anatolica*, occupying larger area in northern Europe; southernmost area of this species is the northern part of Romania (Ujvarosi 2002). The other related species, *A. furcata* is also found in the Balkans.

In this study, the unknown larva of *A. anatolica* is described that presents the similarities with the larvae of the close related species *A. laevis* and *A. furcata*, like the adults of these species.

Material and method

Twenty-eight last instar larvae were collected and preserved in 70% ethanol on 20.8.1999 together with 40 larvae, which were transported to the laboratory alive and two pupal exuviae were collected from mature laboratory-reared pupae. The specimens were collected from the following locality: Turkey, Konya, Beyşehir, Taurus Mountains, Akçabelen, Akçabelen pinari, 1100 m, 37° 30' N, 31° 30' E; leg. and coll. Sipahiler.

The larvae and the pupal exuviae are preserved in alcohol and deposited in my collection in the Department of Biology Education in Hacettepe University.

Description of the final instar larva

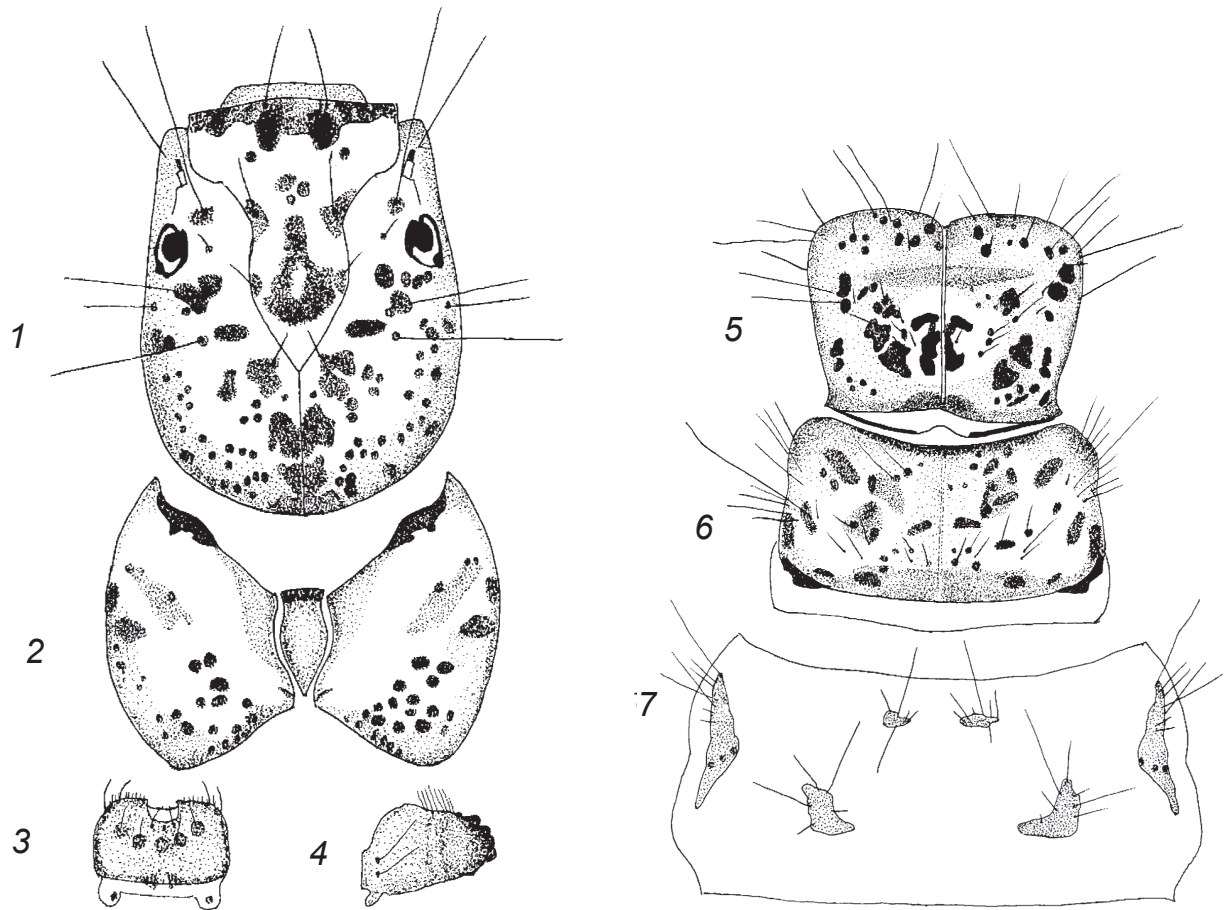
Body length 18-22 mm; the main colour of the head and thorax is yellow.

Head capsule (Fig. 1, 2): The frontoclypeus is blackish on the anterior margin; two large and darker dots are located on the median part; a large black spot, with the pale area in the middle is found in the posterior portion of the frontoclypeus. The large dots are located both sides of the coronal suture and the fronto-clypeal sutures; other dots on the head are small. In ventral view, the ventral apotome is dark brown.

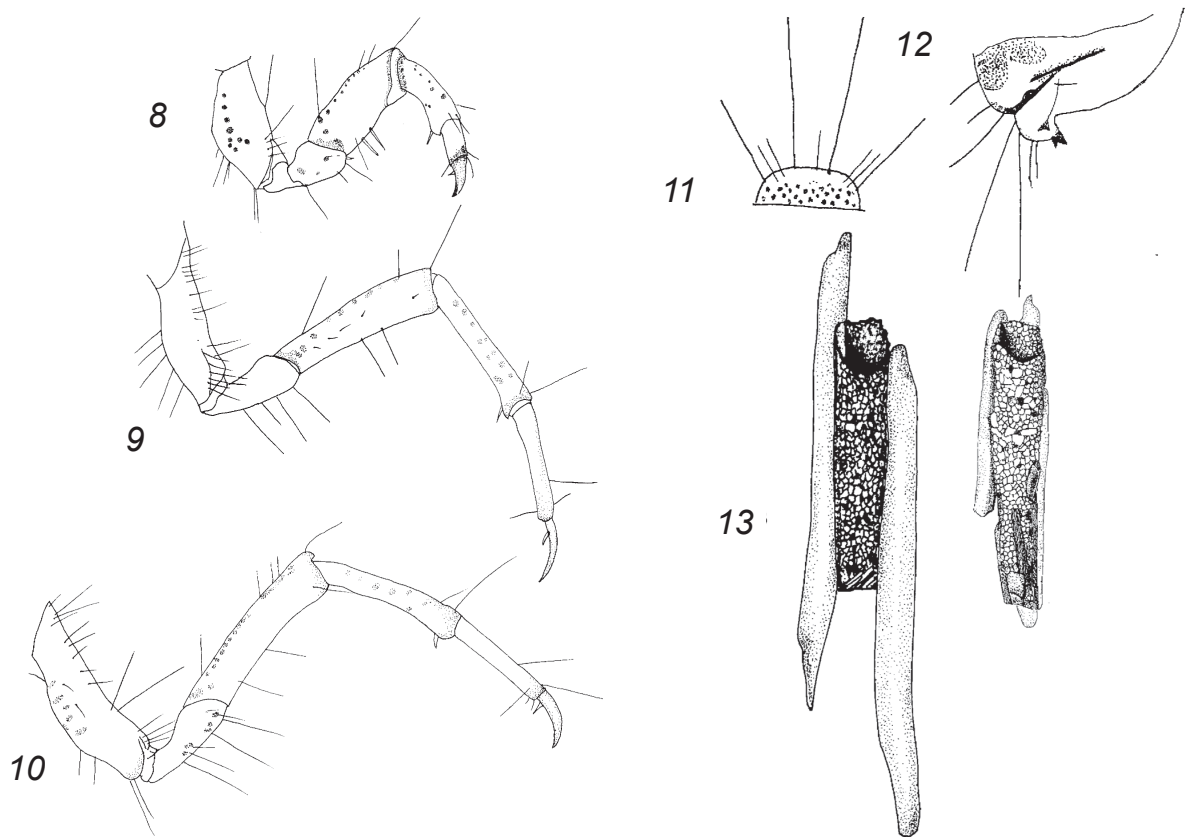
Labrum (Fig. 3) is brown; the median party is dark brown, possessing a median dot and two dots on each sides of it; the setae on the margin of the labrum are yellowish; the other setae are dark brown.

Mandibles (Fig. 4): Black; distal portion is reddish dark brown; the left and the right mandibles are symmetrical in shape with four teeth on the distal margin, which are rounded and equal in breadth.

Thorax: Pronotum (Fig. 5): Yellow; the anterior edge is brown with dark brown dots; the groove, located anteriorly one third of the of the pronotum is dark brown; the posterior half possesses larger spots; there are black spots near the ecdysial line with characteristic pattern, resembling H-shape, which is almost constant in shape and found in every specimens; both side of this pattern there are larger spots on each side.



Figs. 1-7: 1. head - dorsal; 2. head - ventral; 3. labrum - dorsal; 4. right mandible - lateral; 5. pronotum - dorsal; 6. mesonotum - dorsal; 7 - metadorsum - dorsal.



Figs. 8-13: 8. foreleg; 9. midleg; 10. hinleg; 11. dorsal sclerite of abdominal tergite; 12. anal proleg; 13. larval case.

Mesonotum (Fig. 6) is yellow; anterior and posterior edges are brown; the letter with short black area on each side; the spots are rather large; the small dots are located especially on the median part.

Metadorsum (Fig. 7): The anterior median metadorsal sclerites are small; possessing 5-7 setae; the posterior metadorsal sclerites are large, almost L-shaped, bearing 5-7 setae. The lateral metadorsal sclerites are long, dilated medially, narrowing towards the tips; the setae are inserted on the anterior part.

Legs (Figs.8-10) are yellowish brown; distal parts of the segments blackish; the primary ventral setae of the femur of the foreleg are pale yellowish; the basal seta is thicker and shorter than the anterior seta; both are pointed at the tips; in the middle leg, the ventral setae of the femur are long, spine shaped; dark brown; the ventral seta, located in the middle is somewhat longer than the subdistal one; the apex of both setae are pale yellowish; the primary ventral setae of the hind leg are spine shaped, blackish, long, locating in the middle of the femur and on the subdistal part; the subdistal spine is longer than the former one and the apex is pale yellowish.

Abdomen (Figs.11, 12): The tergites of the abdominal segments are dark yellowish; the lateral fringe present on the abdominal segments III-VIII. Both tergites and sternites III-VII with chloride epithelia, which are large, oval and equal in breadth on the sternites and smaller on the tergites, of which the first and the second one are smaller than the other.

The abdominal dorsal sclerite of segment 9 (Fig.11) with distinct numerous small dots on the anterior half; the posterior edge with four long, stout and dark brown-blackish primary setae; two of which are inserted on the median part are longer than the side ones; four or five short setae are located near the posterior margin, namely two pair short setae are found on each side and one short seta is located medially.

The lateral sclerites of the anal prolegs (Fig. 12) are composed of two posterior long and stout setae and five short setae. Anal claws possess a small dorsal accessory claw.

Case (Fig. 13): Case is made with sand grains, somewhat narrowing posteriorly. The detritus particles are used especially on the posterior and anterior portions. Small mollusc and Ostracods shells and some seeds are also used sparsely in some specimens. The most of the cases bear two thick sticks

on each side. Some larvae have shorter and thinner sticks. The posterior membrane is sieve like, having 5-6 holes.

Pupa (exuviae): The numbers of hooks are as follows. The numbers in brackets belong to the second specimen: IV: 3-2 (2-2), V: 2-3 (3-2), 11-14 (12-15), VI: 3-3 (4-4), VII: 3-3 (3-3).

Discussion

The larva of *A. anatolica* and the close related species *A. laevis* and *A. furcata* have similarities in having presegmental dorsolateral gills on the abdominal segment II, lacking in *A. nervosa* (Waringer & Graf 1997). The larvae of *nervosa* group are well known

The larvae of both related species are well known (Lepneva 1971), separating from each other by the coloration of the anterior part of frontoclypeus, which is pale in *A. furcata* and dark in *A. laevis*; the situation of the posterior primary seta of the fore femur, of which the basal seta is blunt at the tip in *A. laevis* (*A. soror* McLachlan, Auct.) and pointed in *A. furcata*. In addition to these characters, the shape of the cases shows some differences, namely, in *A. furcata*, the sticks on the side of the case are thick, as long as the case or only somewhat longer than it, while in *A. laevis* the sticks are often thin and usually much longer than the case. The larva of *A. anatolica* differs from the related species *A. furcata* by the anterior margin of the frontoclypeus in having dark brown blackish colour and close to *A. laevis*, which has also darker edge and possessing large dots on the side of the median part. The case of *A. anatolica* shows both types of cases of the related species. In addition to these diagnostic characters used in the key by Lepneva (Lepneva 1971:236) the H-shaped pattern, which is found in the middle of the pronotum is typical characteristic feature of *A. anatolica* found more or less in every specimen.

REFERENCES

- LEPNEVA S. G. 1971. Trichoptera, in: Fauna of the U.S.S.R., 2(2). Larva and pupae of Integripalpia. Published by the Israel Program for Scientific Translations, 700 pp.
- SCHMID F. 1950. Le genre *Anabolia* Steph. (Trichoptera, Limnophilidae). Rev. Suisse Hydrol. 12: 300-339.
- SIPAHILER F. 2001: *Anabolia anatolica* sp.n., a new species of genus *Anabolia* Stephens (Limnephili-

- lidae, Trichoptera) from southern Anatolia.- Aquatic Insects, **23**: 135-139.
- UJVAROSI L. 2002: The present stage of knowledge on the Trichoptera of the central group of the eastern Carpathians in Rumenia. Proc. 10. Int. Symp. on Trichoptera, Potsdam.- Nova Suppl. Ent., Keltern **15**: 379-394.
- WARINGER J. & GRAF W. 1997: Atlas der Österreichischen Köcherfliegen. Facultas-Universitaetsverlag Wien, 286 pp.

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