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The Larva of *Calamoceras illiesi* Malicky & Kumanski, 1974 (Trichoptera, Calamoceratidae)

La larva de *Calamoceras illiesi* Malicky & Kumanski, 1974 (Trichoptera, Calamoceratidae)

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Abstract

The previously unknown larva of *Calamoceras illiesi* Malicky & Kumanski, 1974 is described and figured based on the material collected from Karabük province in northwestern Turkey. It is similar to *C. marsupus* Brauer, 1865, but differs from this larva by the colouration, pigmentation and several morphological characters, especially the pattern of the mesonotum, segment IX and the lateral sclerites. Some remarks on the distribution and phenology of *C. illiesi* are provided.

Keywords: Caddisflies, Trichoptera, *Calamoceras*, larva, larval case, taxonomy, distribution, phenology, Turkey.

Resumen

Se describe y figura por primera vez la larva de *Calamoceras illiesi* Malicky & Kumanski, 1974, a partir de material recogido en la provincia de Karabük en el noroeste de Turquía. Esta larva es muy similar a la de *C. marsupus* Brauer, 1865, pero difiere de ella en la coloración, pigmentación y en algunos caracteres morfológicos, especialmente en la forma del mesonoto, IX segmento y de los escleritos laterales. Se incluyen algunas observaciones sobre la distribución y fenología de *C. illiesi*.

Palabras clave: Tricópteros, Trichoptera, *Calamoceras*, larva, estuche larvario, taxonomía, distribución, fenología, Turquía.

INTRODUCTION

Calamoceras illiesi Malicky & Kumanski 1974, discovered from Greece and Bulgaria is the second species of the genus *Calamoceras* found in the west Palaearctic region. In Portugal, Spain, Morocco and France occurs *C. marsupus* Brauer, 1865 (GONZÁLEZ *et al*., 1992; VIEIRA-LANERO, 2000; COPPA & TACHET, 2010). The larva (GARCÍA DE JALÓN *et al*., 1987; VIEIRA-LANERO, 2000; COPPA & TACHET, 2010) and the pupa of *C. marsupus* have been described (TACHET & GONZÁLEZ, 2005).

Calamoceras illiesi occurs in Bulgaria (KUMANSKI, 1988), Croatia, Greece (MALICKY, 2005), Turkey (SİPAHİLER, 2005) and the western and southern Caucasus (IVANOV, 2011). In Turkey, *C. illiesi* occupies a large area, being found mostly in northern Turkey in Bolu, Balıkesir, Sinop, Karabük and Kastamonu provinces (SİPAHİLER: 2010, 2012), but also in south western (MALICKY & SİPAHİLER, 1993) and south-eastern Anatolia in Mardin province. The distribution localities in Turkey are given in Table I. The pupa of *C. illiesi* has been described (SİPAHİLER, 2006). In the present paper, the larva of *C. illiesi* is described for the first time, based on the material collected from northwestern Turkey.

MATERIAL AND METHODS

Material examined: Turkey, Karabük, Yenice, Karakaya Stream, 41°13' N, 32°28' E, 23.8.2011, 958 m, 1 larva; Karabük, Kapullu, Baklabostan direction, Külocağı Spring, 21.9.2011, 940 m, 3 larvae, 3 pupae, 2 adult males; same place, 21.9.2011, 1 larva; same place, 22.10.2011, 1 larva, leg. & coll. Sipahiler.

Specimens were collected by hand. The material collected was preserved in 80% ethyl alcohol and deposited in the Insect Collection in Hacettepe University Department of Biology Education. The figures were drawn using a Zeiss Stemi SV 6 microscope.

DESCRIPTION

The length of the full grown larva is 16- 18.5 mm (Fig. 6).

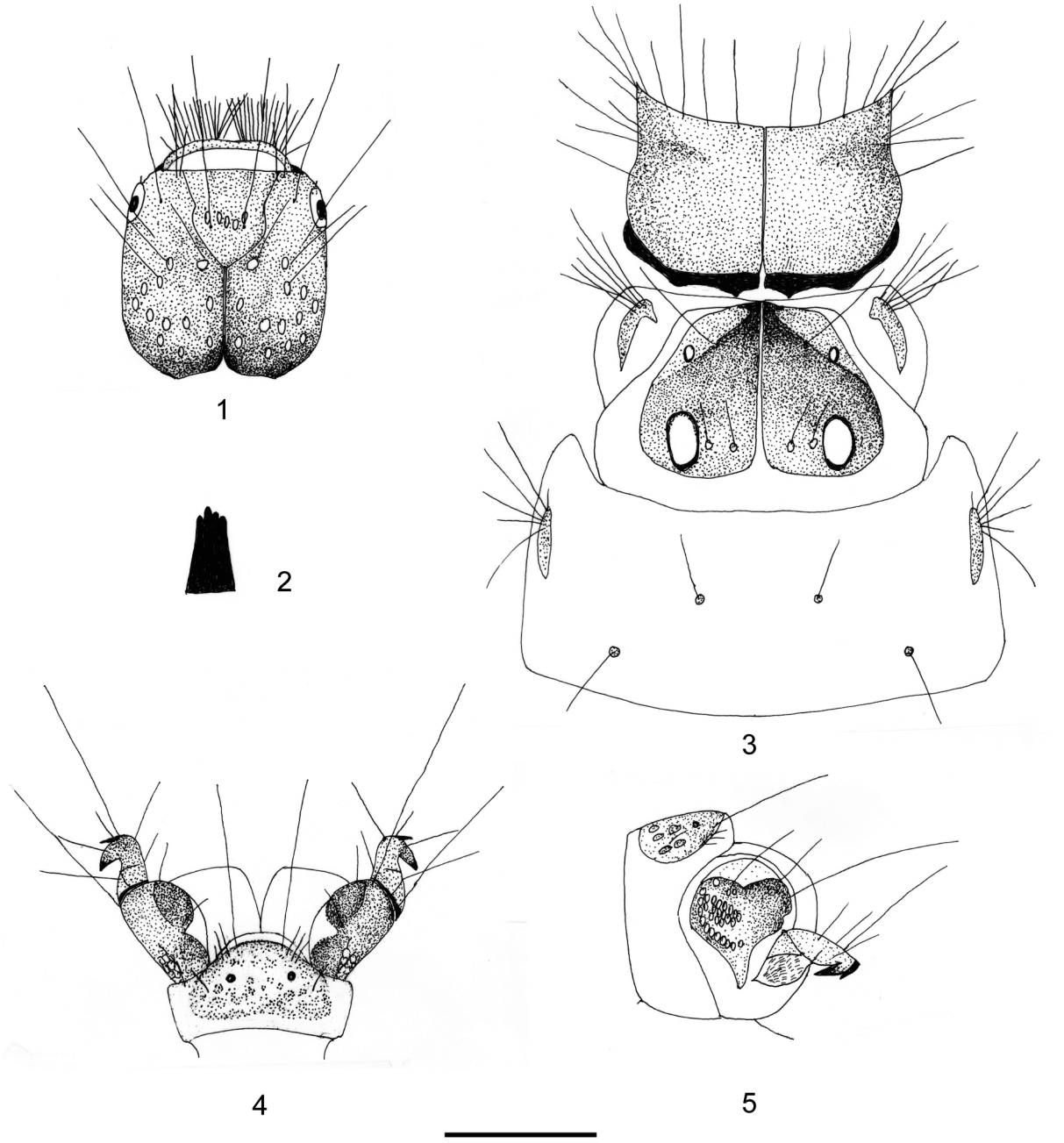
Head (Figs. 1-2). Head width is 1.12-1.17 mm; long and oval; dark brown, with pale testaceous oval spots located mostly on the sides and posterior part of the head, ventrally dark brown; around the eyes with pale rings; in dorsal view, the frontoclypeus is dark brown, with five testaceous spots on the posterior portion (Fig. 1); the ventral apotome is almost triangular, elongated on the posterior portion; the mandibles are black, rather long and broad, with four teeth located terminally (Fig. 2). The labrum is pale brown, the sides of the apical parts are dark brown, dorsally possesses a transverse row of 32 setae on the apical edge, 16 setae on each side of the middle.

Thorax (Fig. 3). The pronotum is uniformly dark brown; the posterior edge is strongly sclerotized, black. The anterior-lateral corners are protruded as pointed projections; in dorsal view, about two-third of the length of the lateral edges are rounded and somewhat dilated towards lateral; in lateral view, the protrochantin is hooked. In dorsal view, the mesonotum is trapezoidal, the median plate is strongly sclerotized, possessing two large pale and oval spots posteriorly and two small pale spots near the anterior part; the posterior part and the sides of the pronotum are slightly sclerotized. The metanotum dorsally possesses two pairs of very small sclerites and a pair of lateral sclerites, which are almost oval bearing each 15 setae (Fig. 3).

The tibia of all legs has a dark brown blackish band, with a few paler spots on the distal and proximal portions, which are ring shaped on the second and third legs, becoming paler on the posterior portion of the foreleg. In lateral view, the ventral edge of the femur and tibia of the foreleg has a row of fine short spines, which are also found on the femur and tibia of the second and third legs but are less prominent.

Abdomen (Figs. 4-6). The abdomen is long and cylindrical. The abdominal segments II-VII bear dorsally and ventrally a pair of short and fine black spines located on each side of the middle of the segments. The first segment bears dorsolaterally two spines located near the lateral humps; the dorsal hump is moderately developed towards dorsal, bearing two spines on the sides; the lateral humps are rather flat, with a almost kidney shaped area covered with small spines, and one spine located posteriorly; the ventral part of the segment possesses two longer spines placed laterally in the middle of segment; segment VIII has dorsally four long spines. The lateral fringe starts at the anterior part of segments III and ends two thirds of segment VII. Segment VIII has on each side a lateral row of small tubercles and among them sparsely longer spines (Fig. 6). The number and position of the abdominal gill filaments are given in Table 2. In dorsal view, the posterior edge of segment IX is roundly dilated, the dorsal sclerite is oval, brown, with dark brown spots; the sides are pale brown, bearing one long seta and twelve short setae located on each side; there are two pits, namely seta-less sensory organ (WALLACE *at al*., 2003) placed anteriorly near the long setae. The lateral sclerite of the anal proleg is medially excised on the proximal side, forming two rounded lobes; the distal lobe is larger, bearing two long and three shorter setae (Fig. 4). The claw is strongly developed and possesses an accessory hook located dorsally and four setae (Fig. 5).

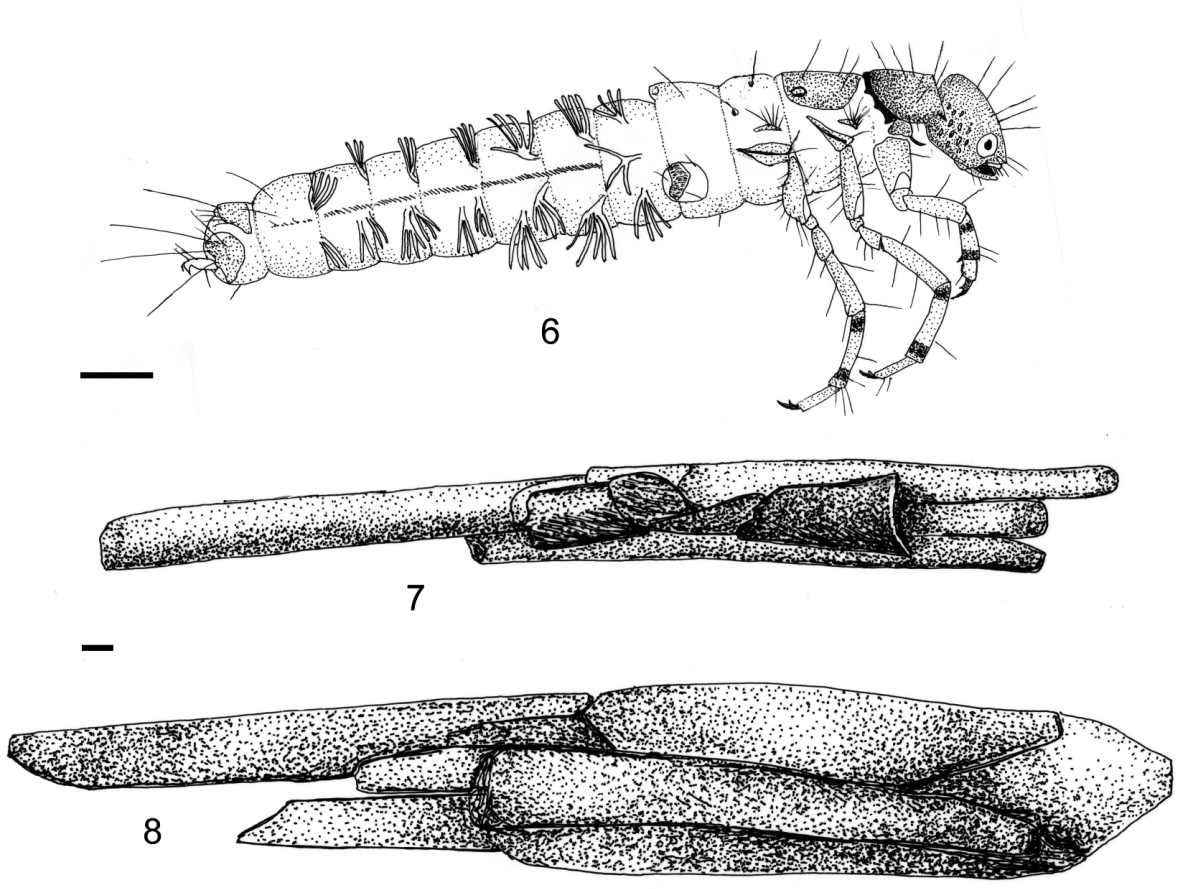
Case (Figs. 7-8). The case is made of woody debris; the length of the case is variable, the smallest one is 2.5 cm and the longest is 7 cm.



Figures 1-5: *Calamoceras illiesi*, last-instar larva. 1, head, dorsal; 2, left mandible, lateral; 3, thorax, dorsal: 4, abdominal segments IX and X, dorsal; 5, abdominal segments IX and X, lateral. Scale bars 1 mm.

REMARKS

The larva of the genus *Calamoceras* is characterized by having the following features: the labrum possesses a transverse row of about 22-32 stout setae; the fore trochantin is hooked; the anterolateral corners of the pronotum are elongated and pointed at the tips; the fore legs are short, the middle legs are long and approximately same length as the hind legs; the mesonotum bears two sclerotized plates; the metanotum is membranous and has only four very small sclerites each bearing one seta and elongated sclerites located on each side, both bearing a few setae; the first abdominal



Figures 6-8: *Calamoceras illiesi*; 6, last-instar larva, lateral; 7, 8: two differents larval cases, ventral view. Scale bars 1 mm.

segment possesses three humps, locating dorsal and lateroventral positions; the anal claws bear an accessory hook; the case is made of piece of woods.

The larva of *C. illiesi* shows some similarities to the larva of *C. marsupus*, by having extended pointed projections on each corner of the anterior edge of pronotum, the roundly dilatation of the pronotum near the anterior edge, the trapezoidal shape of the sclerotized plate of the mesonotum and the hook-shaped projections on the protrochantin. The differences are as follows: in *C. marsupus* (COPPA & TACHET, 2010) the sclerotized part of the mesonotum is uniformly brown, while in *C. illiesi* the mesonotum possesses two large, and two small spots located near the posterior and anterior edges, respectively; the legs of *C. marsupus* are uniformly in colour; in *C. illiesi* the tibia of the legs has distal and proximal dark brown portions with a few spots on them. The dorsal hump of the first abdominal segment is very prominent in *C. marsupus*, while it is moderately developed in *C. illiesi*; the lateral fringe begins on segment II in *C. marsupus*, while it begins on segment III in *C. illiesi*, the abdominal gills of *C. marsupus* are located on segments II-VII; in *C. illiesi* there are dorsolateral gills on the anterior margin of segment VIII. The posterior edge of segment IX is broadly rounded in *C. marsupus*, while in *C. illiesi* the median part is rounded, becoming straight on the sides; the pattern of the sclerotized part is sinuate near the inner margin of the lateral sclerites.

The labrum of *C. illiesi* possesses a transverse row of 32 setae, similar to the labrum of the larva of *C. marsupus,* collected from Portugal and Spain, which also possesses 28 to 32 setae (GARCÍA DE JALÓN *et al*.,1987); the larvae from France has 22 setae on the labrum (COPPA & TACHET, 2010). In addition the larva of *C. illiesi* differs

Table I. Distribution of *Calamoceras illiesi* in Turkey

REGIONS AND PROVINCES	LOCALITIES
Northwestern	
Bolu	Gerede, Gerede Stream, 4.7.1980, 7 males; 28.7.1980, 1 male
Bolu	Gerede, Akyarma, Ünlü Yaylası, 22.7.2005, 1 male
Bolu	Abant, 19.6.1982, 1400 m, 10 males, 7 females; 23.6.1995 (light), 8 males, 7 females
Bolu	Yedigöller, 780 m, 40°59' N/31° 44' E, 9.6.2005 (light), 1 male
Sinop	Türkeli, 435 m, 11.8.2009, 41° 50' N/34°21'E, 1 female pupa
Balıkesir	Bandırma, Manyas, Mürüvetler Village, 4 km south, 50 m, 24.5.1996 1 male
Bartın	Amasra, Cide direction, Hisar, Aydoğmuş, 12.6.2006, 1 male pupa
Karabük	Yenice, Karakaya Stream, 41°13' N/32° 28' E, 23.8.2011, 958 m, 1 larva
Karabük	Kapullu, Baklabostan direction, Külocağı Spring, 21.9.2011, 940 m, 3 larvae, 3 pupae, 2 males; 21.9.2011, 1 larva; 22.10.2011, 1 larva
Karabük	Kapullu, Baklabostan Stream, 1320 m, 41°17' N/32°33' E, 23.8.2011, 1 male
Kastamonu	Araç, Daday direction, 1055 m, 41°20'N/33°20' E, 24.9.2011, 1 larva
İstanbul	Sarıyer, Çırçır Suyu, 10 m, 41°09' N/29°03' E, 23.6.1990, 2 males, 2 females
Northeastern	
Sivas	Koyulhisar, Baldıran Stream, 40°23' N/37°47' E, 6.7.2007, 1 male
Western/Southwestern	
İzmir	Gümüldür, Gümüşsu, 27°00' N/38°05' E, 19.5.1992, 2 males
Muğla	Köyceğiz, Kocabel Stream, 26.4.1987, 1 female; 18.5.1987, 4 males, 2 females; 26.5.1992, 1 male
Muğla	Marmaris, 17 km north, Çetibeli, 70 m, 28°18' N/36°54' E, 8.5.1989, 1 male, 1 female
Muğla	Marmaris 26 km north, Akçapınar Village, 6.5.1989, 1 male
Muğla	Marmaris, 8 km north, Karadere, 160 m, 28°17' N/36°51' E, 27.5.1992, 1 male
Southeastern	
Mardin	Savur, 5 km south, 700 m, 37°26' N/40°56' E, 19.6.2000, 1 female

Table II. The number and position of the abdominal gill filaments

Segment	Dorsal	Lateral	Ventral
II	4	3	5
III	4	4	6
IV	5	3	5
V	4	3	3
VI	3	3	4
VII	4	2	2
VIII	4	-	2

from the larvae of *C. marsupus* collected from Spain by the following features: in *C. marsupus* the frontoclypeus has a lot of pale spots on the posterior, middle and anterior portions (VIEIRA-LANERO, 2000), in *C. illiesi* the frontoclypeus has only a few small spots in the middle; in *C. marsupus* the pronotum has the spots which are intensively found near the posterior edge; in *C illiesi* the pronotum is uniformly dark brown, without spots; in *C. marsupus* the mesonotum possesses a few small spots on the posterior edge, while in *C.*

illiesi the mesonotum has two large spots on the posterior edge.

HABITAT AND PHENOLOGY

The larvae were collected from the edge of a small pool of a mountain spring 1-2 m in width, which becomes larger and flows slower, where pieces of woods and leaves had accumulated (Külocağı Spring), and on the edge of Karakaya Stream, which is 10-15 m in width.

C. illiesi is found 10–1400 m elevations. According to the collection dates (Table I) the flight period of the adults begins at the end of April and continues to the end of August, suggesting that the species has univoltine life cycle.

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