

**DESCRIPTION OF THE LARVA OF
CORDULEGASTER PEKINENSIS SELYS FROM CHINA
(ANISOPTERA: CORDULEGASTRIDAE)**

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Received August 10, 2006 / Revised and Accepted October 4, 2006

The ♀ ultimate instar larva from Beijing area, China, is described and illustrated. It shares some characters with the *Cordulegaster boltonii*-group, and others with the *C. bidentata*-group, but the anal pyramid is longer than in both.

INTRODUCTION

The adult *Cordulegaster* Leach, 1815 is well known from studies by SELYS (1886), McLACHLAN (1896), NEEDHAM (1930), WU (1935), FRASER (1936), ZHU & HAN (1992), LOHMANN (1992) and VAN PELT (1993), but the larva *C. pekinensis* Selys has remained unknown to date. Here, we use a female ultimate instar larva and 3 exuviae, collected from Songshan State Forest Park of Beijing City, China for a description.

***CORDULEGASTER PEKINENSIS* SELYS**

Figures 1-6

M a t e r i a l . — 3♀ exuviae, 1♀ larva. Songshan State Forest Park of Beijing City, China, 19-VI-2005, Jiang Yao-Hua leg. The adult emerged on 25 June 2005.

Body length 43.5 mm, length of abdomen (including caudal appendages) 30.0 mm, maximum head width 9.2 mm, length of hind femur 8.0 mm. Body surface without luster, its surface rather rough. Ground colour brown. Abdomen with light brown spots on each side. Urotergite covered with fine yellow hairs.

H e a d . — Squarish. Labrum of the usual shape; anteclypeus light brown in

color, anterior margin of frons with a row of regular short hairs, interrupted at the middle. Antennae filiform, 7-segmented. Length ratio of segments 1-7 as follows: 0.5: 0.7: 1.1: 0.6: 0.6: 0.6: 0.5 (Fig. 3). Base of antennae with pale yellow stripes. Compound eyes large, building antero-lateral angles, and invaded by black stain at their middle part. Prementum of the elongated type. Length:width ratio of prementum 7.00-6.30 (mm) = 1.1. Anterior margin of ligula with the usual pair of V-shaped apical outgrowths (Fig. 1). Palpal lobes strongly developed, their interior margins with irregularly pointed teeth: 3 teeth along each edge, 2 small teeth on the lower angle of the right lobe, 1 on the left lobe. Apex of all teeth black-brown. Movable hooks long and rather stout, with blackened apex. Palpal setae damaged. Prementum on each side of the midline with five long setae, and three shorter ones more medially placed.

T h o r a x. — Prothorax of the broad type, only slightly narrower than head. A process at the lower margin of the prothoracic pleuron, shown in Figure 2. Synthorax as wide as head. Wing-cases parallel, anterior margin of both fore- and hindwing cases light brown. Hindwing-cases reaching to middle of 4th abdominal segment.

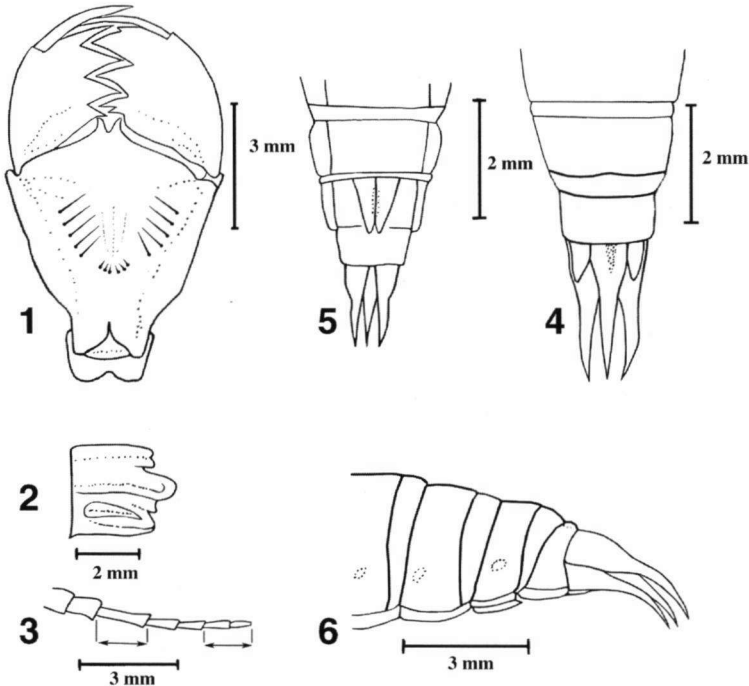
A b d o m e n. — Brown in colour, segments I-IX with light brown stripe on each side. Hind margins of segments I to IX with row of yellow hair, segment X black, but its dorsum with a yellow brown spot. Hind margin with clear black edge and no yellow hairs. Dorsal hooks and lateral spines absent. Epiproct as long as paraprocts and bent ventrally at their tips in dorsal and lateral view (Figs 4, 6). Epiproct surface blackish brown and with short yellow hairs. Ovipositor process reaching slightly beyond anterior ventral margin of segment X (Fig. 5).

DISCUSSION

Cordulegaster Leach was established in 1815 based on *C. boltonii* Donovan. In all, 25 species have currently been described worldwide (DAVIES & TOBIN, 1985; VAN PELT, 1994), and among them, five are from China: *C. brevistigma* Selys, 1854, *C. lunifera* Selys, 1878, *C. pekinensis* Selys, 1886, *C. jinensis* Zhu & Han, 1992 and *C. orientalis* Van Pelt, 1994. According to Van Pelt, *Cordulegaster* may be divided into the two species-groups, the *C. boltonii* and *C. bidentata* groups. The larvae of almost all species from Europe, the Middle East, and North America have been described (see VERSCHUREN, 1989; VERSCHUREN et al., 1987), but not those from China. The larva of *Cordulegaster pekinensis* is thus the first to become described from China.

Cordulegaster larvae live buried in the bottom mud of swift-running, well-oxygenated brooks, with only the compound eyes exposed. Their exuviae are usually conspicuous on shrubs and rocks, and are often found up to 3-4 m away from water. The larva of *C. pekinensis* cohabits with that of *Anotogaster sieboldii*, which has the same stream habitat preference; adults look similar and may also

co-occur. The larva of the latter was described by HIROSE (1962) and can be separated from that of *C. pekinensis* by the anterior margin of the frons, which in *A. sieboldii* has a row of hairs of different length, its total length (♀) is 53-54 mm (\bar{X} = 53 mm; n = 4), antennal annulus 1 > antenna 4+5, head/prothorax ratio 1.0-1.1 (\bar{X} = 1.0; n = 4), prementum L/W = 3.00-3.50 (\bar{X} = 3.3; n = 4), anal pyramid L/W 1.5-1.6 (\bar{X} = 1.5; n = 4); its wing-cases are not parallel, the tips of the ovipositor are not separated, and a row of blunt denticles (lacking in *C. pekinensis*) sits on the outside of the paraproct. The corresponding data for *C. pekinensis* Selys are: total length (♀) exuviae 40.10-43.50 mm (\bar{X} = 41.80 mm; n = 3), head/prothorax ratio 1.37-1.38 mm (\bar{X} = 1.37 mm; n = 3), annulus 1/4+5 = 1.10-1.11 (\bar{X} = 1.10; n = 3), prementum L/W 1.09-1.11 (\bar{X} = 1.11; n = 3), prementum W+/W-: 2.10-2.11 (\bar{X} = 2.10; n = 3) and anal pyramid L/W: 1.30-1.31 (\bar{X} = 1.30; n = 3). *C. pekinensis* Selys is also different in shape from the two groups of *Cordulegaster* from Europe: the long prementum is as in the *boltonii*-group, but the absence of spines of the segments 8 and 9 of the abdomen is as in the *bidentata*-group. Furthermore, annulus 1 of the antenna is as long as annuli 4+5 and the anal pyramid is longer than that of the *boltonii* and *bidentata* groups.



Figs 1-6. *Cordulegaster pekinensis*, female exuviae: (1) labium in dorsal view; - (2) prothoracic pleural processes, dorsal view; - (3) right antenna; - (4) caudal appendages, dorsal view; - (5) abdomen in ventral view; - (6) caudal appendages, lateral view.

ACKNOWLEDGEMENTS

We are grateful to Prof. HENRI DUMONT (Ghent University, Belgium), Prof. H.-Q. ZHU (Shanxi University, China), and Dr JIH-CHING LIEN (National Institute of Preventive Medicine, Taiwan, China), whose encouragement stimulated the completion of this work and we deeply mourn the late Prof. CHUNG-CHICH KUAN (National Chung Hsing University, Taiwan, China).

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