

**DESCRIPTION OF THE LAST LARVAL INSTAR OF
EPOPHTHALMIA VITTATA CYANOCEPHALA HAGEN, 1867
(ANISOPTERA: CORDULIIDAE)***

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The ultimate instar larva is described and figured from exuviae, collected near Anuradhapura, Sri Lanka. Our present knowledge of the larval forms of the genus is briefly discussed.

INTRODUCTION

The genus *Epophthalmia* Burmeister comprises the eleven taxa of which *E. biosdinata* Lewis, 1969 is known only from a fossil record while other ten members are distributed throughout southern and eastern Asia (Tab. I). Although the representatives of the genus *Epophthalmia* are very large and conspicuous insects, they are rather poorly represented in collections and some of them are very inadequately known. This is particularly true for the larval stages to which very little attention has been devoted in the past. They are characterized by very long legs, a small rectangular head with two latero-posterior projections and small pointed eyes as well as by a broadly oval abdomen with strong dorsal spines. Of special interest, however, is the very big and specialized labium with peculiarly shaped labial palps, which appears to be unique in the whole family Corduliidae.

In the detailed revision of the genus *Epophthalmia*, produced by LIEFTINCK (1931), the author also summarized all published information on the larval features of representatives of that genus and described the last larval instars of three species, viz. *E. elegans*, *E. vittigera* and *E. vittata vittata*. Apart from *E. elegans* which has been studied in detail and is well known (ISHIDA, 1996), the two other descriptions are based on very limited numbers of larvae or

* Dedicated to Professor Dr Gerhard JURZITZA, on the occasion of his 70th birthday.

exuviae, which were not reared to metamorphosis or taken during emergence.

Also in *Epophthalmia vittata cyanocephala*, which is endemic to Sri Lanka, larval stages and exuviae have not been described previously. Unfortunately, the present description is based on a single larval skin, without definite association with the adult stage. According to the fact that the subspecies is confined to Sri Lanka and at the same time is the only representative of the genus on the island the determination is not doubtful, yet it makes any comparison and differential analysis with other taxa almost impossible.

Table 1

Extant representatives of the genus *Epophthalmia* with their known distribution range — [Taxa in which last larval instars have been described are asterisked]

Species	Distribution
<i>australis</i> Hagen, 1867	Indonesia (Celebes, Maluku)
* <i>e. elegans</i> (Brauer, 1865)	China, Japan, Hong Kong, Taiwan
<i>e. yagasakii</i> Eda, 1986	North Korea
<i>f. frontalis</i> Selys, 1871	India (Assam, western Himalaya), Thailand, Malaysia
<i>f. binocellata</i> (Fraser, 1924)	India (Western Ghats)
* <i>vittata vittata</i> Burmeister, 1839	India (Peninsular India, Uttar Pradesh, West Bengal)
* <i>v. cyanocephala</i> Hagen, 1867	Sri Lanka
<i>v. sundana</i> Lieftinck, 1931	Indonesia (eastern Sumatra, West & Central Java), Vietnam
* <i>vittigera vittigera</i> (Rambur, 1842)	Indonesia (Bangka, Billiton, Java, Bali, Borneo), Malaysia, Singapur, the Philippines
<i>v. bellicosa</i> Lieftinck, 1948	India (eastern India), Myanmar (Burma), Thailand, Vietnam

DESCRIPTION

Material. — 1 ex. (♂); Water tank 700m SE of the Abhayagiri Dagoba, Anuradhapura, Anuradhapura District, Northern Central Province, Sri Lanka, 19-1-1995, alt. 100 m; M. Bedjanič leg. & det. Material is deposited in author's private collection.

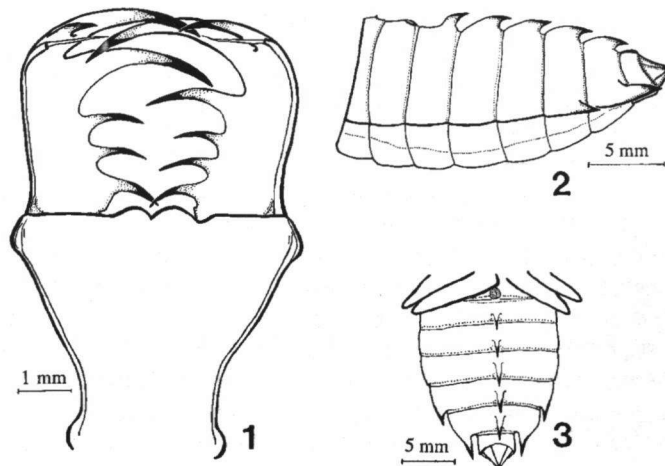
Head. — In general appearance it agrees well with the detailed description provided by LIEFTINCK (1931). Eyes in the latero-anterior corner of the head small and prominent, directed upwards. Two projections on dorsal latero-posterior part directed backwards, following the imaginary diagonal to the eye on opposite side of the head. On the lateral surface, below the projection, two fields of small thin setae. Between bases of antennae a short median process that reaches the middle of first antennal joints. Anterior part prominent, gradually flattened towards posterior edge, which ends at the anterior part of ocelli. Prominent anterior part of median process semicircular, flattened frontally, with dorsal edge slightly thicker. With the exception of first segments antennae broken.

Labium very big, with peculiarly shaped labial palps (Fig. 1). Viewing laterally, mask very flattened with labial palps curved upright following the

shape of the head. The articulation between prementum and postmentum reaches distally the middle of metathoracic poststernite and coxae of metathoracic legs respectively. Labial palps and prementum (basal part and articulation prementum-postmentum not indicated) are shown in Figure 1. On the left labial palp fourth hook the longest, sixth the shortest and on the right labial palp fifth hook the longest, first three hooks being the shortest. Apical halves of hooks black.

L e g s. — Very long, coxae of prothoracic legs and apical half of coxae of mesothoracic legs overgrown with longer hair-like setae, coxae of metathoracic legs sparsely overgrown with shorter setae. Lateral edges of thoracic basisternites with tufts of long hair-like setae.

A b d o m e n. — Very large, oblonge, abdominal segments S5-S7 the broadest. Ventral surface of abdominal segments S1-S8 very poorly setose, posterior edge of S9 with generally sparse longer hair-like setae, which are the longest on the lateral fringe and reach half of S10 in length. Ventral surface of S10 laterally overgrown with very short setae, which cover also the ventral surface of paraprocts, between which long hair-like setae outgrow. Dorsal surface of abdomen in surrounding of mid-dorsal hooks and posterior edges of segments overgrown with very small spiniform setae. Lateral margins of abdomen overgrown with short strong setae. Between these, on abdominal segments S6-S9, much longer hair-like setae outgrow, being most bushy apically. Mid-dorsal hooks on segments S4(?)—S9, S3 with only small pointed protuberance, lateral spines on segments S8-S9 (Figs 2 and 3). Anal pyramid a trifle longer than abdominal segment S10, paraprocts being the long-



Figs 1-3. *Epophthalmia vittata cyanocephala* Hagen, larval structural features: (1) prementum (without basal part) and labial palps, dorsal view; — (2) abdomen, dorsal view; — (3) abdomen, left lateral view (dorsal spine (?) on abdominal segment S4 broken).

est, epiproct little shorter, cerci the shortest but almost as long as epiproct (Fig. 3).

M e a s u r e m e n t s (mm).— Body length: 31.5; abdomen length: 21.5; abdomen width: 13.1; length of 10th. abdominal segment incl. anal pyramid: 2.9; tibia length (prothoracic, mesothoracic & metathoracic leg): 8.2, 9.9, 13.0; femur length (metathoracic leg): 12.2; labium length: 9.9; prementum length: 6.1; prementum width: 5.3; moveable hook length: 1.0; length of latero-posterior head-projections: 0.7.

DISCUSSION

Larval forms of the representatives of genus *Epophthalmia* are very poorly known. According to LIEFTINCK (1931) the known last larval instars are rather similar in some characters, however, as already stated by himself, a little doubt remains as to the correctness of descriptions since material used in his study was not reared or taken during emergence. In view of our present knowledge on the distribution of *Epophthalmia* species there are actually some problems. The description of *E. v. vittata* based on a single larva collected near Calcutta in India, may refer rather to *E. vittigera bellicosa*, which also occurs in that region and was described later. It is also uncertain whether description of last larval instar of *E. frontalis* (FRASER, 1919) was correctly ascribed to *E. v. vittata* by LIEFTINCK (1931) and FRASER (1936). Both authors overlooked information on the number of dorsal spines given in Fraser's description, which are stated to be on the fifth to ninth abdominal segments, while in the description of *E. v. vittata* LIEFTINCK (1931) dorsal spines in this species are on the fourth to ninth abdominal segment. The speculation that FRASER (1919) actually described the last larval instar of *E. frontalis binocellata* is therefore also possible.

Although it is almost impossible and not very reasonable to make conclusions on the basis of single exuviae, there are some clear differences between *E. v. vittata* and *E. vittata cyanocephala* in the shape of the labial palps. In *E. vittata cyanocephala*, the very long fourth and very short sixth hooks of the left labial palp are specific and show clear difference in comparison with *E. v. vittata* in which fifth and sixth hooks on the left labial palp are the longest (LIEFTINCK, 1931). It can be immediately separated from *E. elegans* by the absence of the well developed dorsal spine on the third abdominal segment (ISHIDA, 1996). Useful characters for distinguishing *E. vittata cyanocephala* from *E. v. vittigera* are different shape of the labial palps, the smaller latero-posterior head-projections and different shape of the short median process between the bases of antennae. When the shape of labial palps is concerned, it is worth mentioning that a study of a dozen exuviae of *E. v. vittigera*, collected at Riam Kannan Lake in Borneo, revealed individual deviation in the form of the labial palps, the shape of the left and right sides in some specimens being reversed.

For the analysis of other differential features much more material is needed, not only in *E. vittata cyanocephala*, but especially in the species with still undescribed

last larval instars. Only then will a competent revision of the larval forms in the genus *Epopththalmia* be possible.

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