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SHORT COMMUNICATIONS

DESCRIPTION OF THE LARVA OF *PSEUDAGRION DECORUM* (RAMBUR, 1842) FROM CENTRAL INDIA (ZYGOPTERA: COENAGRIONIDAE)

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The final instar larva is described and figured, based on exuviae and larvae from Sagar, Madhya Pradesh. Brief notes on its biology are provided.

INTRODUCTION

The genus *Pseudagrion* Selys, 1876 is widely distributed in the Oriental, Ethiopian and Australian regions and, within Indian limits, 11 species have been recorded (PRASAD & VARSHNEY, 1995). *Pseudagrion decorum* (Ramb.) is distributed throughout continental India, Burma, Sri Lanka (FRASER, 1933; KUMAR & PRASAD, 1981) and Nepal (ST. QUENTIN, 1970). FRASER (1919) described the larva of *P. hypermelas* Sel. and *P. microcephalum* (Ramb.) from Madhya Pradesh, India. KUMAR (1973) described the final instar larva of *P. rubriceps* Sel. and *P. laidlawi* Fraser from Dehra Dun Valley, India. The present paper provides some basic information on the morphology of the final instar larva of *P. decorum.*

MATERIAL AND METHODS

18 ♂ and 22 ♀ final instar larvae of *P. decorum* were collected from the littoral zone of Sagar Lake, Sagar (M.P.) India on 30-VIII-1982 and reared in the laboratory to emergence. Species determinations were made from teneral imagos. Both exuviae and larvae preserved in 70% ethyl alcohol and different parts of larvae and exuviae were gently warmed in 5% aqueous KOH solution for 10 to 15 minutes, washed in water, dehydrated and stained with picro-indigo-carmine. The material was left overnight in cedarwood oil for clearance and mounted in Canada balsam. Microphotographs were taken with a stereo microscope and illustrations were drawn with the help of slides and photographs. Measurements were taken using an ocular micrometer and with a C. Reichert micrometer. Terminology used for the labium is adopted from CORBET (1953), for caudal gills from MacNEILL (1960), and for

tibial combs from MacNEILL (1967). Field observations were carried out throughout the year 1982--83.

THE SITE

All larvae were collected from the littoral zone of Sagar Lake, which is situated in the heart of Sagar, M.P. India at 23°52'N and 78°45'E at about 533 m above mean sea level. It is surrounded by a number of houses, a stony fencing wall, a metalled road on eastern, western, northern sides respectively and on the southern side by an open cultivated field. The eutrophic rain-fed lake covers an area of 81 hectares with a catchment area of about 1410 hectares. The lake receives domestic sewage from a city bus-stand. There is a weir on the western side of the lake which regulates the outflow and water level of the lake. Apart from domestic sewage, pollution of the lake also occurs due to bathing, clothes washing and wallowing of cattle. The common grasses *Parsicum proliferum, Oryza sativa, Paspalidium germinatum* and *Hydrorhiza aristata* and some sedges like *Scirpus littoralis, Eleocharis palustris* and *Cyperus indicus* were growing on the banks of the lake. *Hydrilla verticillata, Potamogeton crispus, P. natans, P. pectinatus, Vallisneria spiralis* are common rooted submerged plants. *Nymphaea stellata* and *Eichhornia crassipes* form the floating vegetation. The practice of cultivating hydrophytes of economic value like *Trapa bispinosa, Nelumbo nucifera* is common. A sample of water was taken and analyzed on the same date as the larval collection and the results of chemical analyses were: air and water temperature 26.5°C and 25°C respectively. Secchi transparency 40 cm, pH 8.5, free carbondioxide nil, bicarbonates 84 ppm, carbonates 20 ppm, total hardness 118 ppm, dissolved oxygen 7.2 ppm, percent oxygen saturation 81.67%.

DESCRIPTION

M e a s u r e m e n t s (mean of 30 larvae, in mm): – Body length (excluding antenna and caudal lamella): 13.16; – head width: 3.05; – antenna: 2.84; – prementum, length: 2.47; – width: 2.02; – palpi: 0.90; – wing sheath 4.5; – prothoracic leg (femur-tibia-tarsus): 2.2, 2.6, 1.6; – mesothoracic leg: 2.7, 3.2, 1.4; – metathoracic leg: 3.1, 3.8, 1.5; – median lamella: 6.4; – lateral lamella: 6.5.

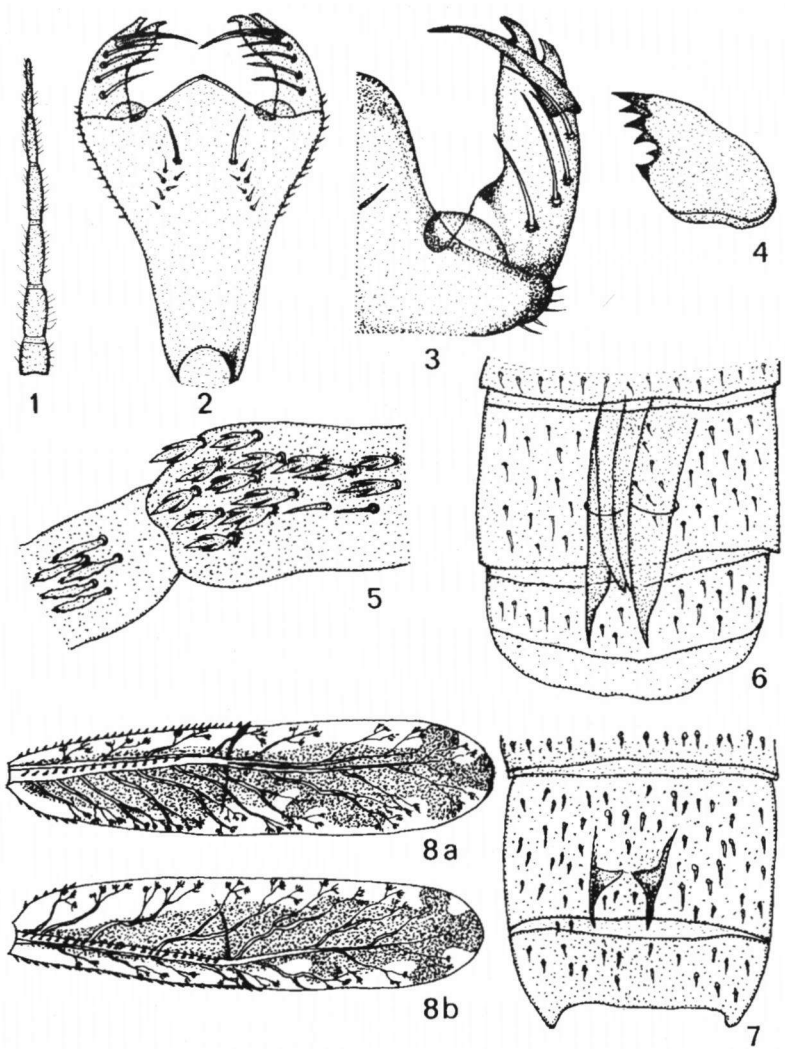
The ground colour is deep brown, some larvae greenish brown with significant *Pseudagrion* colour pattern of caudal lamellae.

H e a d. – Anterior margin round, posterior margin slightly concave, lateral side bulging, posterolateral sides markedly narrow and beset with small setae. Eyes prominent, colour grey to blackish brown. Three ocelli prominently present.

Antennae filiform (Fig. 1), 7 segmented, pedicel about twice as long as scapus, all segments beset with piliform setae.

Prementum (Fig. 2) extending posteriorly up to the base of the middle coxae, convexly rounded distally and provided with a few small claviform setae. Prementum provided with 1+1 premental setae and 6 scattered microsetae present near the base of each premental seta. A row of spiniform setae present on the lateral sides of prementum. Palpal setae 4+4. Distal end of palpus (Fig. 3) divided into two lobes, the outer denticular region possessing four teeth and the inner lobe produced into a curved endhook. Movable hook slender and sharp and about half of the length of palpus. Mandible as shown in Figure 4.

T h o r a x. – Hind wing sheaths reaching notably up to the posterior half of the fourth abdominal segment. Proximal and distal parts of femora and proximal part of the tibia of each leg banded with dark brown colour. Tibial comb (Fig. 5) consists of a number of scattered tridentate and a few unidentate setae, while the inner side of tarsi beset with pectinate setae.



Figs 1-8. Larva of *Pseudagrion decorum* (Rambur): (1) antenna; – (2) labium inner view of prementum; – (3) right labial palp of prementum; – (4) right mandible, dorsal view; – (5) tibial comb and tarsi; – (6) female gonapophysis, ventral view; – (7) male gonapophysis, ventral view; – (8) median (a) and lateral (b) caudal lamella.

A b d o m e n. – Female gonapophysis (Fig. 6) comprising two pairs of long valvular processes arising from the posterior margin of the eighth abdominal segment and extending up to the end of the tenth segment. Inner valve is smaller than outer valve. Male gonapophysis (Fig. 7) consists of a pair of equal-sized conical processes present on the 9th abdominal segment.

Caudal lamella with distinct pigmentation. Duplex nodate type, nodi distinctly indicated by a transverse line, apices rounded, postnodal region of both lamellae possessing piliform setae. Tracheation well developed. There is a median trachea from which secondary and tertiary branches arise.

Median lamella (Fig. 8a), dorsal antenodal region possessing 25-28, ventral antenodal region bearing 6-8, and median trachea possessing 15-17 spiniform setae.

Lateral lamella (Fig. 8b), dorsal antenodal region possessing 5-7, ventral antenodal region with 26-30 and median trachea possessing 22-24 spiniform setae.

NOTES ON BIOLOGY

The larvae of *P. decorum* were collected from the littoral zone of Sagar Lake, perennial ponds and temporary monsoon ponds of Sagar district (M.P.), India. Larvae remain attached to the submerged vegetation. The associated zygopteran larvae were *Ischnura senegalensis, I. rufostigma, Ceriagrion coromandelianum, Enallagma parvum* and *Cercion malayanum.* Emergence occurred throughout the year except in extreme winter (water temperature 17-18°C) i.e. December to February. Endophytic oviposition takes place during the emergence period. This is a multivoltine species with four generations in a year in Sagar Lake.

DISCUSSION

KUMAR (1973) described the final instar larva of *P. rubriceps* and *P. laidlawi.* He reported palpal setal formula for both *P. rubriceps* and *P. laidlawi* as 4+4. Palpal setal formula for the larva of *P. decorum* is also 4+4. He mentioned premental setal formula for *P. rubriceps* as 1+1 and did not mention the number of microsetae, which as he mentioned for the larva of *P. laidlawi* is 1/4+4/1. The premental setal formula for *P. decorum* is 1/6+6/1. KUMAR (1973) found larvae of *P. rubriceps* in temporary monsoon ponds, slow-running marshy streams, among the aquatic vegetation near the banks of large rivers and *P. laidlawi* in slow-running perennial streams and near the banks of large rivers in Dehra Dun Valley, India. Larvae of *P. decorum* were found only in still-water bodies like Sagar Lake, perennial ponds and temporary monsoon ponds in Sagar district (M.P.), India. LIEFTINCK et al. (1984) reported larvae of *P. microcephalum* living in stagnant and slow-flowing waters of various kind in Taiwan. KUMAR (1985) recorded *P. rubriceps* as a multivoltine species with three generations, whereas SURI BABU (1986) reported *P. decorum* as a multivoltine species with four generations, two in the summer

season, one in the rainy season and one prolonged generation in the winter season. It is concluded that larvae of *Pseudagrion* species flourish in a wide variety of biotopes.

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