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SHORT COMMUNICATIONS

THE LARVA OF *ISOMMA HIEROGLYPHICUM* SELYS, 1892 (ANISOPTERA: GOMPHIDAE)

S.G. BUTLER
Red Willow, All Stretton, Shropshire SY6 6HN, United Kingdom

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A ♂ final instar larva from the N of Madagascar is described and illustrated. The taxonomic position of the sp. is discussed on the basis of a morphological comparison, using 3 specimens of the closely related genus *Phyllogomphus*, and the description of the adult *Malgassogomphus robinsoni*.

INTRODUCTION

Isomma is a monotypic genus found only in Madagascar. Until now its larva has been unknown and few adults are present in collections. FRASER (1956) gives three locations: Nosy Be (an island off the NW coast), Tamatave and Maroantsetra on the NE coast. The single known adult specimen of the closely related species *Malgassogomphus robinsoni* was taken on the island of Nosy Boraha, approx. 150 km S of Maroantsetra (CAMMAERTS, 1987).

Between 18-23rd April 1999, during the final leg of a three-week visit to Madagascar, larvae and adults of an unknown gomphid were found in six feeder streams close to the river Antsohabe near Sambava in northeastern Madagascar. Larvae were dredged from sandy substrates in streams ranging from 3 to 6m in width, whilst two were found in the larger river itself, one of which emerged in June 2000. During the period spent in the area only one male exuviae was discovered, this was clinging vertically to reeds approx.10cm above the stream surface. Adult gomphids were collected during this time, though no adults or larvae were discovered in other areas visited on the island. Several larvae were brought back to United Kingdom, one male F-2 moulted to F-1 (7-XII-1999), to F (3-II-2000) and finally emerged 2-VI-2000. The previously obtained adults were later confirmed as *Isomma hieroglyphicum* by Dr D.A.L Davies.

ISOMMA HIEROGLYPHICUM SELYS, 1892

Figures 1-4, 5b, 7

Material. – 1♂ F instar exuviae Sambava-Andapa road Madagascar (14°32.62′S) (49°59.02′E). – Additional material: 1 each of F-1 & F-2 exuviae from above specimen; – 1♂ final instar exuviae in situ from same site; – 1 F-3 exuviae & 1 F-4 exuviae from larvae which subsequently died; – 2 F-1 larvae, 2 F-2 larvae, 1 F-2 larva, 1 F-3 larva & 1 F-4 larva. – All larvae in alcohol.

Head. – Viewed dorsally (Fig. 1), it is typically gomphid in shape being somewhat sub-pentagonal and has a length:width ratio of 6.5:7.0. The frontal shelf margin is slightly concave, though a patch of setae on its margin with the clypeus somewhat obscures this. The frontal margin of the labrum has a fringe of fine setae. The antennae (Fig. 4) are long and somewhat banana-shaped, the ratios of segments 1 to 4 are: 1.0; 0.4; 2.8 and 0.16; the final segment is no more than a tiny pale boss. The interior border of the antennae is densely hairy and the general surface is covered in detritus indicating the presence of more scattered setae. The ocelli are markedly pale, the anterior appearing to extend with wing-like markings onto the vertex. The surface of the occiput is granular, especially on the rear margin, where there is a radial pattern on the rounded lateral angle.

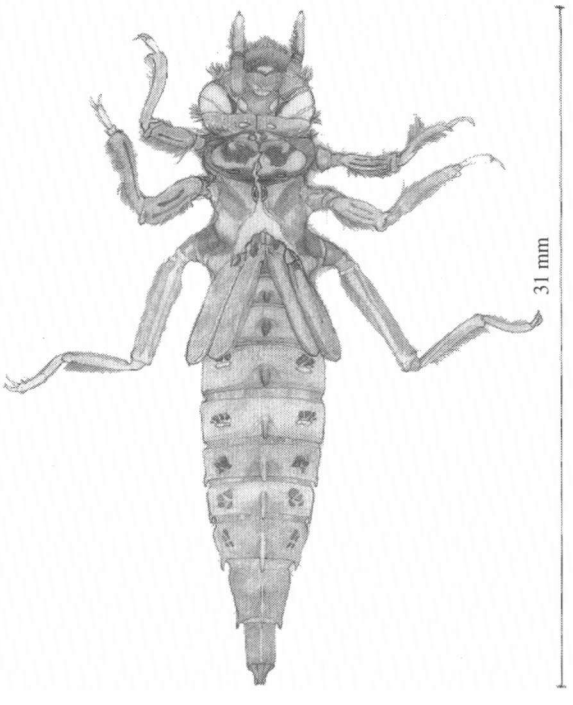


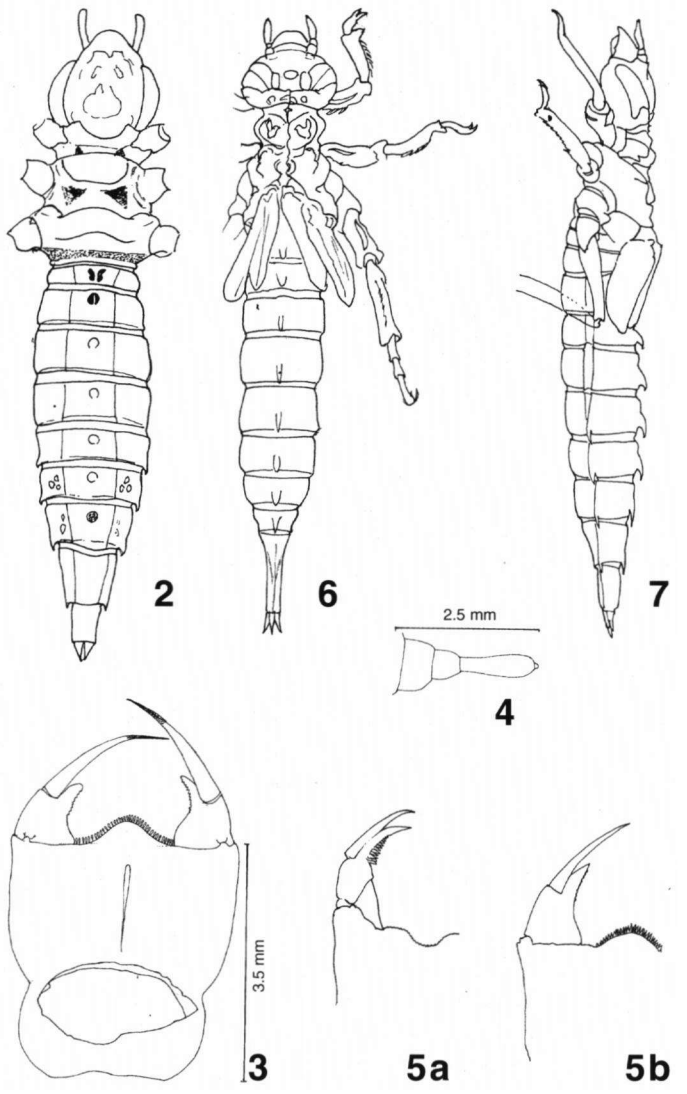
Fig. 1. *Isomma hieroglyphicum*: male exuviae, dorsal view.

The labium (Fig. 3) is rectangular (length:basal width ratio 1.0:0.9); the length from rear hinge to distal margin is 3.5 mm approx. The distal margin of the labium is markedly convex, the rounded central area bearing a clump of short, peglike setae. The outer margin of the palpal lobe is short, approximately 2 ½ times shorter than the moveable hook and the inner margin of the lobe has a row of short teeth, which are equal in length.

Thorax. – In dorsal view the prothorax (Fig. 1) is sub-oval in shape, the raised area is somewhat anchor-shaped and granular, the sunken latero-frontal areas between being

smooth. The remainder of the thorax is finely granular, the wing cases extending halfway across abdominal segment 4.

Ventrally the thorax is lacking in setae and there is a clear shallow scoop between the



Figs 2-7. Larval structural features of *Isomma hieroglyphicum* (Figs 2-4, 5b, 7), *Phyllogomphus* sp. (Fig. 5a) and *P. brunneus* (Fig. 6): (2) exuviae, ventral view; – (3) labium, dorsal view; – (4) right hand antenna; – (5) labium, dorsal view; – (6) exuviae, dorsal view; – (7) exuviae, lateral view.

2nd pair of legs, indicating where the rear margin of the labium rests.

The fore and middle legs have short and stocky femora and pronounced tibial spurs, the rear legs are longer and when straightened reach to between segs 6 & 7. All legs are covered with fine setae, which are concentrated particularly on the dorsal keels.

A b d o m e n. – In ventral view (Fig 2) it is fairly elongated, segm. 10 of about the same length as segm. 9. The ratio length:basal width of segm. 9 is 1.0:0.75 and that of segm. 10 1.0:1.0.

Bosses are present at the base of segs 4-7, and are similar in appearance to the genitalia on segm. 3. The abdomen is widest at segs 3 & 4. It is overall grey brown, gradually darkening to black by segm. 10. Dorsally (Fig. 1) the colour is similar (although some live larvae had a cream stripe which ran longitudinally along the centre of the dorsum and included the spines) and segs 8-10 are also more keeled in cross section. Dorsal spines are present on segs 2-9 (Fig. 7), those on 2 & 3 being shorter and recurved, those on the succeeding segments gradually becoming flattened and lengthened, by 7-9 reaching over the margin of the succeeding segment. Lateral spines are present on segs 6-9, being slightly divergent and also recurved, they are surrounded and slightly obscured by the fine lateral setae which are present on the lateral margins of all segments.

The surface of the dorsum is granular with a sparse covering of fine setae. Around the ridge and tip of each dorsal spine are a cluster of somewhat coarser setae. The usual gomphid rosette-like markings are observable on segs 4-9, they are located 2/3rds the way from the dorsal spines to the lateral margin of each segment.

The anal appendages are approximately 2/3rds the length of segm. 10. Cerci and epiprocts are of equal length, both being slightly shorter than the paraprocts.

DIFFERENTIAL DIAGNOSIS

The exuviae obtained from Sambava are here compared with three exuviae of *Phyllogomphus*, which (apart from *M. robinsoni* of which no larva has been described) are probably the closest in affinity to *Isomma* (CARLE, 1986), viz. *P. brunneus* Pinhey (Okavanga Delta), *P. montana* Fraser (Cameroon) and an unknown species (Ivory Coast). In the following text. these latter are referred to as *Phyllogomphus* spp.

Overall *Isomma* (31mm) is smaller than *Phyllogomphus* spp., which range from 45--55mm. The labium shows significant differences, in the shape of the distal margin of the prementum, the smaller base of the palpal lobe and inner palpal teeth. In contrast to the *Phyllogomphus* spp., where the distal margin of the labium is in each case deeply concave (Fig. 5b), in *Isomma* it is markedly convex (Figs 3 & 5b), the rounded central area bearing a clump of short peglike setae. *Phyllogomphus* spp. have a longer palpal outer basal margin and longer inner palpal teeth (Fig. 5a) which decrease in size distally.

Ventrally the thorax of *I. hieroglyphicum* is hairless, whereas there are noticeable setae on *Phyllogomphus* spp. The labial scoop on *Phyllogomphus* spp. is less clear but indicates that the hinge of the labium at rest extends at most to halfway between the bases of the 1st and 2nd pair of legs. Dorsally the posterior area of the prothoracic lobe is

more produced laterally than that in *Phyllogomphus* spp. (Fig. 6).

The rear legs of *I. hieroglyphicum* are relatively longer than those of *Phyllogomphus* spp, which when extended reach at most to the end of segm. 4. Curiously, this is reflected in the adults of both *Isomma* and *Malgassogomphus*, a character shared with the Oriental tribe Cyclogomphini (Gomphinae) sensu CARLE (1986) (in CAMMAERTS, 1987).

The abdomen of *I. hieroglyphicum* is fairly elongated, segm. 10 has about the same length as segm. 9, whereas in *Phyllogomphus* spp. segm. 10 is considerably longer than 9, the length:basal width ratios for segm. 9 average at about 2:1, for segm. 10 they range from 3.5:1.0 to 2.0:1.0. Dorsal spines are present on segs 2-9 (F-instar) and 3-9 (F-1), however in *Phyllogomphus* spp. spines are present on 8 & 9, or are absent).

DISCUSSION

CARLE (1986) places *Isomma* in Phyllogomphinae, along with *Phyllogomphus* Selys, 1854 (incl. *Guineagomphus* Compte Sart, 1963) and *Ceratogomphus* Selys, 1854. CAMMAERTS (1987) further refers *Malgassogomphus* to this subfamily, commenting on its affinity with *Isomma*. There are clear similarities between the larvae of *Phyllogomphus* and *I. hieroglyphicum*, such as an overall granular surface, tibial spurs on fore and middle legs, antennal shape and structure and the overall shape. Some of the structural differences, such as an elongated segment 10, may be adaptive and, therefore, less significant. The significant shape of the distal margin of the prementum and the structure of the palpal lobes (Figs 5a-b), when compared with those of the available Phyllogomphus species, appear to be more interesting. Hopefully the larva of *M. robinsoni* will soon become available for comparison as it currently appears to be the closest relative.

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