

**DESCRIPTION OF THE LAST INSTAR LARVA  
OF *RHYOTHEMIS S. SEMIHYALINA* (DESJARDINS, 1832)  
(ANISOPTERA: LIBELLULIDAE)**

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The morphology is described, illustrated and compared with the features known in  
4 Asiatic and Australian congeners, and a note on the larval habitat is provided.

**INTRODUCTION**

DAVIES & TOBIN (1984) list *Rhyothmis semihyalina* (Desj.) as an Asiatic species with the form *separata* (Sel., 1849) peculiar to Africa. However, PINHEY (1985) emphasized that there is no clear dividing line between *separata* and *semihyalina*, since intermediate specimens occur in Madagascar. Consequently, he considered all African specimens referable to *R. s. semihyalina*. This opinion is also shared by DUMONT (1991), who distinguishes the nominal subspecies in Africa with the *syriaca* (Sel., 1849) subspecies restricted to the Lake Hula area in the Levant. We follow PINHEY (1985), assigning our specimens from southern Africa to the nominal taxon. The larval morphology of *R. s. semihyalina* and its habitat were so far unknown.

**METHODS AND TERMINOLOGY**

The specimens were collected in the field and reared through to adult emergence in the laboratory. The identification is based on the teneral adults. Exuviae were stored in 75% ethyl alcohol. CORBET's (1953) terminology for the labium was adopted, and abdominal segments are indicated as S1 ... S10. Drawings and measurements (Tab. I) were made using a stereo microscope and a camera lucida.

## MORPHOLOGICAL DESCRIPTION

**Material.** – 3 ♂, 3 ♀, Kenneth Stainbank Nature Reserve, Durban, KwaZulu-Natal, 27-IX-1994, 20-I-1995, G. Whiteley & R. Gopane leg.; – 1 ♂, Wakefields Estate, Headlands, Zimbabwe, 11-XII-1995, G. Whiteley & T. Clark leg.

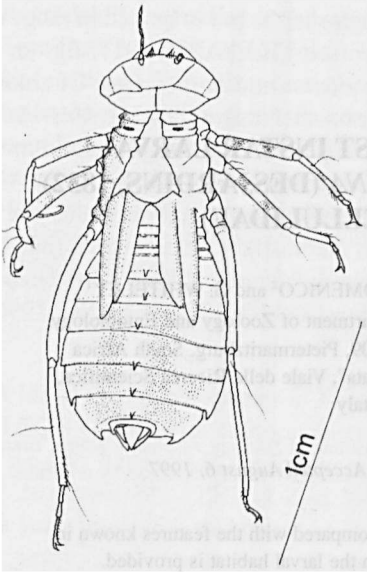


Fig. 1. *Rhyothemis semihyalina*, last instar exuviae.

General shape of the body resembles that of the Corduliidae. Size small, colour pale brown, surface smooth and glabrous (Fig. 1).

Head small, transverse, with small eyes and obtuse post-ocular lobes. A few small spines behind the eyes and thin, long setae between the antennae insertions (Fig. 2A). Antennae setose, the 3rd and 6th segments the longest, the 7th segment ogival and clearly pointed. The 1st, 2nd and 6th segments dark (Fig. 2C). Mask very short and concave, triangular, as wide as long. Premental setae  $5_5+4_5$  or  $5_4+6_5$  (Fig. 2D). Prementum with groups of extremely thin hair-like setae between the premental setae and the distal margin. Distal margin of prementum with very small and regularly-spaced tooth-like crenations, and strong, sharp spiniform setae on the medial third (Fig. 3A). Distal margin and inner angle of

palpi with complex saw-shaped crenations. A long, pointed spine on each crenation, and several smaller spines between these (Fig. 3B). Palpal setae  $6\&6$  or  $7\&7$ . Movable hook thin and sharp, as long as, or a little shorter than palpal setae (Figs 2D, 3B). Articulation between prementum and postmentum not reaching metasternum (Fig. 2B).

Thorax narrow and glabrous. Legs slender, almost glabrous or with scarce, long and thin hair-like setae. Dark rings more evident on femora of fore- and midlegs. Wingsheaths reaching S6 (Fig. 1).

Abdomen ovoid, triquetral in section, much wider than thorax. S6 and S7 are the widest segments (Fig. 4A). S4-S9 with long and slender dorsal spines, and S8-S9 with short, sharp lateral spines. The lateral spines of S9 point inwards, following the outline of the segment (Figs 1, 4A, 4B). An uninterrupted line of small spines on the distal margin of S7, S8 and S9 dorsally, and S8 and S9 ventrally (Fig. 4C), and very long hair-like setae on distal and lateral margins of S9 (Figs 4A, 4B). Two lateral dark areas on the dorsal surface of the abdomen, variable in extension (Fig. 1). S10 short and anal pyramid very small, just exceeding, in dorsal view, the line between the tips of the lateral spines of S9 (Fig. 1). Epiproct as long as paraprocts.

Cerci about two thirds the length of the anal pyramid (Fig. 4B). For measurements see Table I.

The only specimen from Zimbabwe is quite different from the South African ones. It is generally more massive and has a relatively short mask. Also, the spines on S8 are clearly pointed inwards, there is no dorsal spine on S9, and the crenulations on the distal and inner margins of the palpus are directed backwards and have fewer spines.

#### HABITAT

The habitat is shallow, swampy pools and the margins of lakes and reservoirs, where there is a profusion of sedges and reeds but only small areas of open water. Occasionally the species also occurs in temporary pools.

#### DISCUSSION

To date, 20 *Rhyothemis* species have been recorded from Africa, Asia and Australia (DAVIES & TOBIN, 1984). The larval morphology of most of these is unknown, except for the Australasian *R. phyllis* (Sulz.) (NEEDHAM, 1904; LIEFTINCK, 1962), *R. braganza* Karsch and *R. graphiptera* (Ramb.) (HAWKING, 1993), and the Indian *R. v. variegata* (L.) (CHISHTI, 1988). The general larval morphology of *R. semihyalina* is similar to that of *R. phyllis* as described by NEEDHAM (1904; cf. Fig. 4). Both are slender, corduliid-like species, with a smooth and glabrous

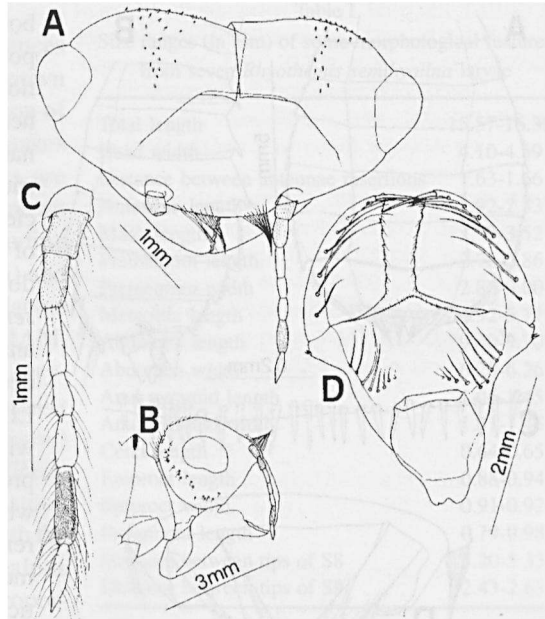


Fig. 2. *Rhyothemis semihyalina*: (A) head; – (B) head and mask, lateral view; – (C) antenna; – (D) mask.

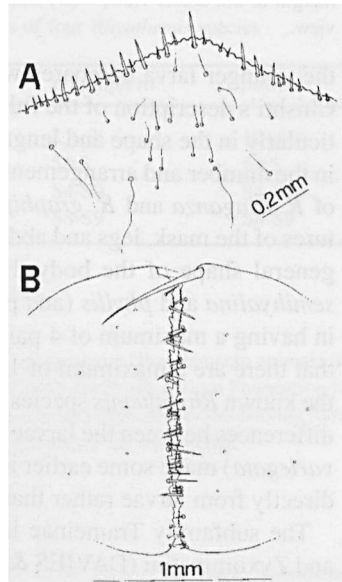


Fig. 3. *Rhyothemis semihyalina*: (A) detail of the distal margin of prementum; – (B) detail of the distal margin of palpi.

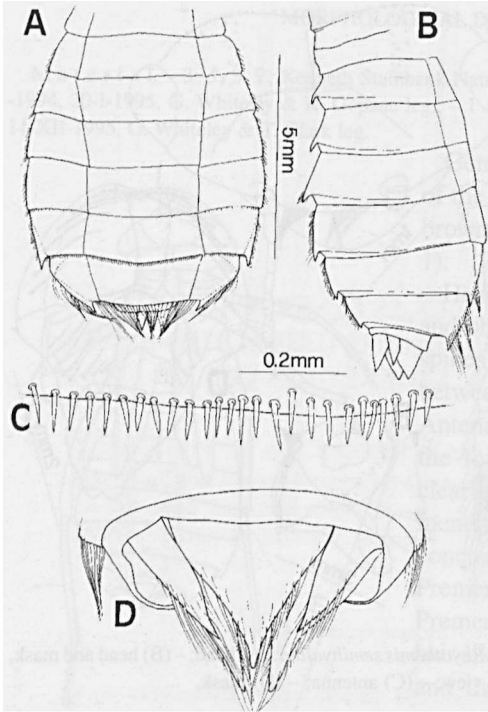


Fig. 4. *Rhyothemis semihyalina*: (A) abdomen, ventral view; – (B) abdomen, lateral view; – (C) detail of distal margin of S8, dorsal view; – (D) anal pyramid, dorsal view.

the younger larva compares well with our description of *R. s. semihyalina*. Yet, Chishti's description of the full-grown specimen appears to be very different; particularly in the shape and length of abdomen, lateral spines and anal pyramid, and in the number and arrangement of the premental and palpal setae. The descriptions of *R. braganza* and *R. graphiptera* (HAWKING, 1993) consider only some features of the mask, legs and abdominal spines, making it impossible to compare the general shape of the body. However, the two species are distinguished from *semihyalina* and *phyllis* (and probably from all the other known libellulid larvae) in having a maximum of 4 pairs of premental setae (though in the key it is stated that there are a maximum of 10 premental setae). A more detailed comparison of the known *Rhyothemis* species is given in Table II. The apparent large interspecific differences between the larvae of different ages within the same species (as in *R. v. variegata*) make some earlier identifications suspect, especially as they were made directly from larvae rather than from the newly-emerged adults.

The subfamily Trameinae is divided into the tribes Rhyothemistini, Trameini and Zyxommatini (DAVIES & TOBIN, 1984). *Rhyothemis* is the only genus in the

body. In particular, the shape of the post-ocular lobes, the lateral position of the small eyes and the small head are very similar, as well as the narrow thorax and the flat, wide, triquetral abdomen. The two species differ however, in the number of premental and palpal setae, in the dorsal spine on S10 (absent in *semihyalina*) and in the size of the anal pyramid (larger in *phyllis*). The description of *R. p. phyllis* given by LIEFTINCK (1962) does not agree with NEEDHAM (1904). Lieftinck provides only a drawing of the whole larva in dorsal view, with its remarkably short and wide abdomen and with wingsheaths and articulation between hind femura and tibiae reaching S9. Furthermore, S10 is almost completely hidden by S9. The shape of the head is also different. CHISHTI (1988) published two drawings of the general aspect of *R. v. variegata*, and details of the mask. The drawing of

## Rhyothemistini.

Even with the marked differences in larval morphologies of the known *Rhyothemis* species, the inclusion of this genus in a separate tribe makes sense, since its known species are very different from all other known genera of the subfamily, including *Pantala* and *Tramea* (Trameini) and *Zyxomma* (Zyxommatini). The larvae of *Pantala flavescens* (NEEDHAM, 1904; PINHEY, 1959), *Tramea euryale* (NEEDHAM, 1904), *T. basilaris* (PINHEY, 1962, in *Trapezostigma*) and *Zyxomma flavicans* (CORBET, 1957) are, in contrast, large and stout, with large eyes, a wide head, with the distal margin of the labial palpus strongly serrated, and with a proportionately narrow abdomen. *Tramea* and *Pantala* also have a very long anal pyramid and long and sharp lateral spines on S8 and S9. These features make the Trameinae a very heterogeneous group, consisting of morphologically completely different genera.

Table I

Size ranges (in mm) of some morphological features from seven *Rhyothemis semihyalina* larvae

Total length	15.57-16.30
Head width	4.10-4.59
Distance between antennae insertions	1.63-1.66
Antennae length	1.92-2.33
Mask length	2.93-3.52
Prementum length	2.76-2.86
Prementum width	2.86-3.00
Metatibia length	4.92-5.77
Abdomen length	9.40-9.70
Abdomen width	6.20-6.26
Anal pyramid length	1.06-1.45
Anal pyramid width	1.31-1.45
Cerci length	0.64-0.65
Epiproct length	0.88-0.94
Epiproct width	0.91-0.92
Paraprocta length	0.79-0.98
Distance between tips of S8	5.20-5.33
Distance between tips of S9	2.43-2.63

Table II

Comparison between some morphological features of four *Rhyothemis* species

	<i>semihyalina</i>	<i>braganza</i>	<i>graphiptera</i>	<i>phyllis</i>
Premental setae	5 <sub>5</sub> + <sub>4</sub> / 5 <sub>4</sub> + <sub>5</sub> 6	2 <sub>2</sub> + <sub>2</sub>	2 <sub>2</sub> + <sub>2</sub>	10+10
Palpal setae	6&6 / 7&7	5&5	5&5	5&5
Dorsal spines on	S4-S9	S4-S9	S4-S9	S4-S10
Lateral spines on	S8-S9	S8-S9	S8-S9	S8-S9

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