

**DESCRIPTION OF THE LAST INSTAR LARVA OF  
*HEMISTIGMA ALBIPUNCTA* (RAMBUR, 1842) AND  
COMPARISON WITH OTHER BRACHYDIPLACTINAE  
(ANISOPTERA: LIBELLULIDAE)**

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The morphology of the last instar larva of the African *H. albipuncta* is illustrated and described. A comparison is then made with the South American *Elga leptostyla* and *Nephepeltia phryne*.

**INTRODUCTION**

*Hemistigma* Kirby, 1889 is an African genus with only two species (DAVIES & TOBIN, 1985). *H. albipuncta* (Rambur, 1842) is widespread from KwaZulu-Natal to eastern and western equatorial Africa, while *H. affinis* Rambur, 1842 occurs in Madagascar.

Very few of the 25 genera of Brachydiplactinae have described larval morphology. Here, the larval morphology of *H. albipuncta* is compared with that of two Brachydiplactinae species of the genera *Elga* Ris, 1909 and *Nephepeltia* Kirby, 1889. The Venezuelan species *Elga leptostyla* and *Nephepeltia phryne* were described by DE MARMELS (1990).

**METHODS AND TERMINOLOGY**

The larvae described here were collected in the field and reared through to adult emergence in the laboratory. Species determination was from the teneral imago. Exuviae were stored in 75% ethyl alcohol and drawn using a stereo microscope and a camera lucida (50X magnification). All measurements were to the nearest 0.02 mm using a micrometric eyepiece. The following measurements were made: total body length, abdomen width, distance between apices of postero-lateral angles at S8 and

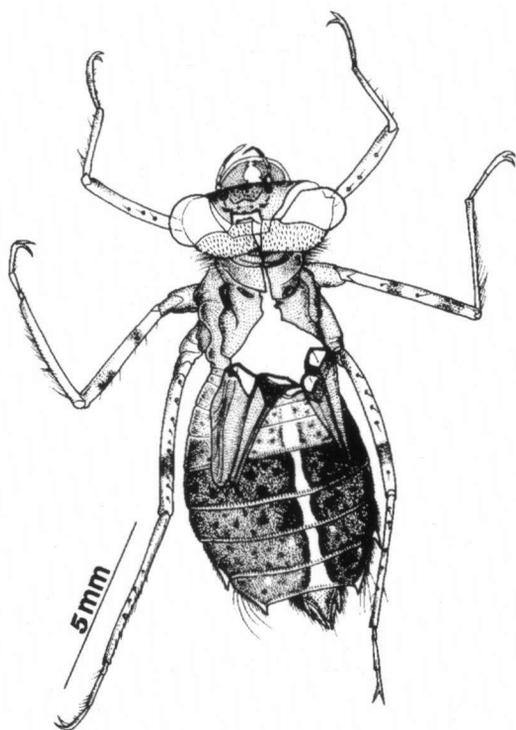


Fig. 1. *Hemistigma albipuncta*, final instar exuviae.

sertions of the antennae. Post-ocular region with very small spots, each bearing a very small spiniform seta (Figs 1, 2b,c). Antennae 7-segmented, the 3<sup>rd</sup> and the 7<sup>th</sup> being the longest. 1<sup>st</sup>, 2<sup>nd</sup>, part of the 3<sup>rd</sup> and 6<sup>th</sup> segments dark (Fig. 2c). Mask elongated, longer than wide, with small circular spots and dark, irregular areas, the latter only evident in lateral view (Figs 2b,c,d). Prementum with spiniform setae on distal margin. Lateral margins with a pair of spiniform setae near insertion of palpi (Fig. 2d). Premental setae 12+13. Palpi with distal and inner margins weakly crenated and with many long, strong spiniform setae. Small spiniform setae near premental insertion. Palpal setae 10&10. Movable hook sharp, not longer than palpal setae. Articulation between prementum and postmentum reaching mesocoxae (Figs 2b,c). Mask spotted on both anterior and posterior surfaces (Figs 2b,c,d). Mandibles stout, notably dark, especially along inner border. Each mandible bears two large distal teeth and two smaller proximal teeth. (In Fig. 2a only one of the distal teeth visible in right mandible).

**T h o r a x** and wing-sheaths darkened. Mesosternum with a row of setae just behind the articulation between prementum and postmentum (Fig. 2b). Wing-sheaths extend to the middle of S6 (Fig. 1). Legs long, with rows of spiniform setae and

S9, epiproct width, anal pyramid width, antennae length, distance between antennae insertions in dorsal view, abdomen length, prementum length, mask length and width (after being cut at the postmentum level and laid out, but not flattened) in ventral view, epiproct and cerci length in lateral view. CORBET's (1953) terminology for the labium was adopted. Abdominal segments are indicated as S1...S10.

### MORPHOLOGICAL DESCRIPTION

**M a t e r i a l.** — 6 ♂ and 4 ♀, Charter's Creek Nature Reserve, Mtubatuba, KwaZulu-Natal, South Africa (28°14'S, 32°21'E), 16-X-1994, 10-I-1995, 19-IV-1995, G. Whiteley leg.; 31-X-1996, G. Whiteley & J. Bannatyne leg.

**H a b i t u s** like *Sympetrinae* (Fig. 1). Head large and transverse. Eyes prominent.

**H e a d** with dark W-shaped bands and spots between the insertions of the antennae.

Post-ocular region with very small spots, each bearing a very small spiniform seta (Figs 1, 2b,c). Antennae 7-segmented, the 3<sup>rd</sup> and the 7<sup>th</sup> being the longest. 1<sup>st</sup>, 2<sup>nd</sup>, part of the 3<sup>rd</sup> and 6<sup>th</sup> segments dark (Fig. 2c). Mask elongated, longer than wide, with small circular spots and dark, irregular areas, the latter only evident in lateral view (Figs 2b,c,d). Prementum with spiniform setae on distal margin. Lateral margins with a pair of spiniform setae near insertion of palpi (Fig. 2d). Premental setae 12+13. Palpi with distal and inner margins weakly crenated and with many long, strong spiniform setae. Small spiniform setae near premental insertion. Palpal setae 10&10. Movable hook sharp, not longer than palpal setae. Articulation between prementum and postmentum reaching mesocoxae (Figs 2b,c). Mask spotted on both anterior and posterior surfaces (Figs 2b,c,d). Mandibles stout, notably dark, especially along inner border. Each mandible bears two large distal teeth and two smaller proximal teeth. (In Fig. 2a only one of the distal teeth visible in right mandible).

**T h o r a x** and wing-sheaths darkened. Mesosternum with a row of setae just behind the articulation between prementum and postmentum (Fig. 2b). Wing-sheaths extend to the middle of S6 (Fig. 1). Legs long, with rows of spiniform setae and

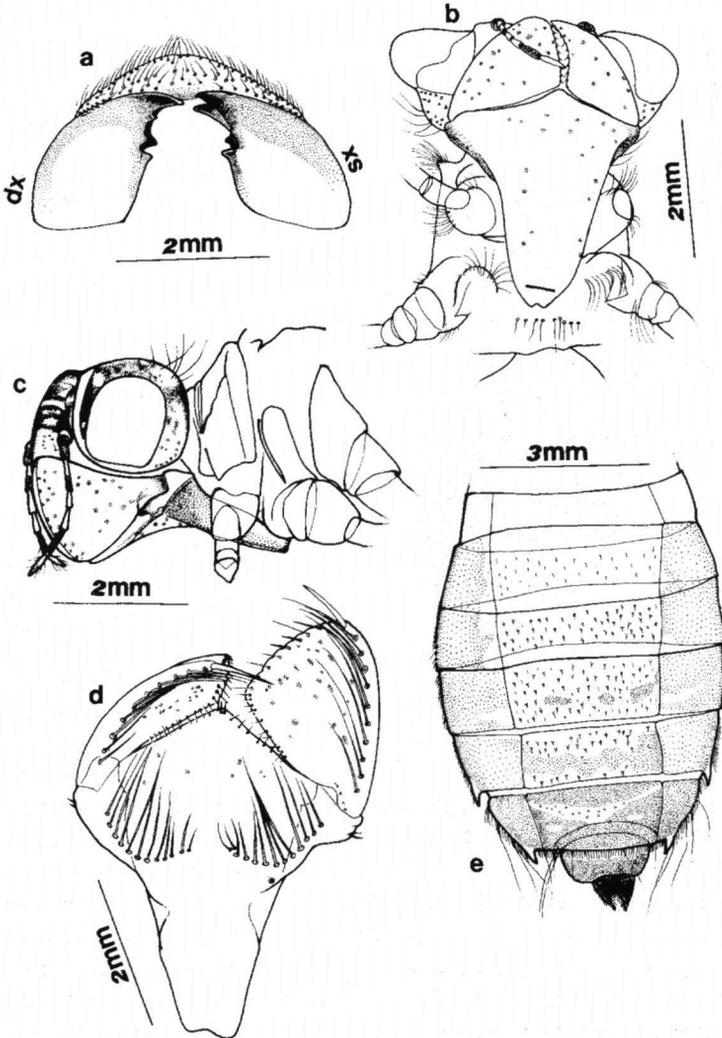


Fig. 2. *Hemistigma albipuncta*: (a) mandibles (ventral view); – (b) head and part of thorax (ventral view); – (c) head and part of thorax (lateral view); – (d) mask; – (e) abdomen (ventral view).

dark bands on femora (Fig. 1). Articulation between metafemora and tibiae at S8 (Fig. 1). Ventral surface of tarsi and distal end of tibiae with a double row of simple spine-like setae. Tibiae also with small spine-like setae.

**A b d o m e n** ovoid, with S6 the widest segment. Colour very variable, uniformly pale brown to fairly dark. Dorsal surface of abdomen covered by small, dark, irregularly-spaced spots, each bearing a very small spiniform seta. Central

Table I  
Summary of dimensions of 10 exuviae of *Hemistigma albipuncta*

Character	Range (mm)	Mean (mm)
Total body length	12.90 - 15.90	14.17
Antennae length	1.97 - 2.20	2.05
Distance between antennae insertions	1.20 - 1.36	1.28
Prementum length	3.32 - 3.91	3.53
Mask length	4.10 - 4.47	4.43
Mask width	2.79 - 3.28	2.97
Abdomen length	7.20 - 8.80	8.04
Abdomen width	4.84 - 5.43	5.14
Distance between tips of postero-lateral angles at S8	3.90 - 4.43	4.13
Distance between tips of postero-lateral angles at S9	1.90 - 2.62	2.38
Anal pyramid width	1.15 - 1.35	1.22
Epiproct length	0.79 - 0.91	0.84
Epiproct width	0.75 - 0.81	0.79
Cerci length	0.50 - 0.63	0.58

dorsal line with a pale light stripe, and with no hooks nor carinae (Fig. 1). Ventral surface with dark markings, the extent to which varies among specimens. Fringes of setae on the lateral margins of S6-S9 and very long setae on the distal margin of S9. Small lateral spines on S8 and S9 (Figs 1, 2e). Anal pyramid small, about as long as S9. Epiproctum as long as paraprocta. Cerci length two thirds the length of epiproctum (Fig. 1).

For dimensions, see Table I.

## DISCUSSION

The Brachydiplactinae appears to be a very heterogeneous group, as the described larvae have very different features. They differ in shape and relative dimension of the eyes, head, shape of the borders of palpi, length of legs, presence of dorsal hooks, and dimensions of the anal pyramid (Tab. II). No morphological characters are common to all species, except that all are relatively small-sized and bear lateral spines on S8 and S9, but this is a common libellulid character. Overall, *Elga leptostyla* is distinctly different from *Hemistigma albipuncta* and *Nephepeltia phryne*. For a comparison of the main features of the three species, see Table II.

Table II  
Comparison of selected characters between Brachydiplactinae species

Characters	<i>Hemistigma albipuncta</i>	<i>Elga leptostyla</i>	<i>Nephepeltia phryne</i>
Total body length	14.17 mm*	11.5 mm	10.6 mm
Eyes	prominent	small	prominent
Palpal crenations	shallow	deep	shallow
Dorsal hooks	absent	S3-S9	absent
Lateral spines	S8-S9	S8-S9	S8-S9
Anal pyramid	as long as S9	as long as S9	longer than S9

(\*) Final instar exuviae

Both the larvae and adults of *H. albipuncta* are associated with thickly-vegetated reed beds, and often, shallow, warm water of temporary marshes. PINHEY (1981, 1985) mentions that in Mozambique it is common in woodland or forest, and in these it may be locally dominant. Our observations suggest, along with *Diplacodes lefebvrei* (Ramb.), it may at times be semi-aquatic in its last larval instar. We have seen a group of more than 20 teneral individuals of these two species in sunny forest clearings adjacent to dried out marshes in KwaZulu-Natal.

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