

**DESCRIPTION OF THE ADULT MALE AND LARVA
OF *BRECHMORHOGA ARCHBOLDI* (DONNELLY)
FROM THE FRENCH WEST INDIES
(ANISOPTERA: LIBELLULIDAE)**

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Scapanea archboldi (Donnelly), known only from the holotype ♀ from Dominica, was recently transferred to *Brechmorhoga* (R.W. Garrison & N. von Ellenrieder, 2006, *Can. Ent.* 138: 269-284). Here, its ♂ and larva are described from Guadeloupe and Martinique; some behavioural and habitat notes, and distribution for this sp. are included. *B. grenadensis* Kirby is considered to be a distinct sp. and not a sp. of *B. praecox* (Hag.).

INTRODUCTION

Brechmorhoga archboldi (Donnelly), described from a single female (DONNELLY, 1970), was previously known only from Dominica in the Lesser Antilles. It had been collected by different authors, especially from Guadeloupe, but had been variously identified as *Brechmorhoga* sp. (DOMMANGET, 2000), *B. praecox* (Hagen) (GOYAUD, 1994), and *B. praecox grenadensis* (Ris) (GRAND, 1996; HOFMANN, 1999). Lack of voucher material precluded a correct identification and assignment for this poorly known species.

During the 2005 Martinique and 2006 Guadeloupe surveys, several specimens of this species were collected. Comparison of females from Guadeloupe with the holotype female of *Scapanea archboldi* from Dominica, housed in the USNM (Washington) (GARRISON & VON ELLENRIEDER, 2006), revealed all specimens to be conspecific. Males collected with females in Guadeloupe and Martinique were thus correctly assigned to *B. archboldi*.

MATERIAL AND METHODS

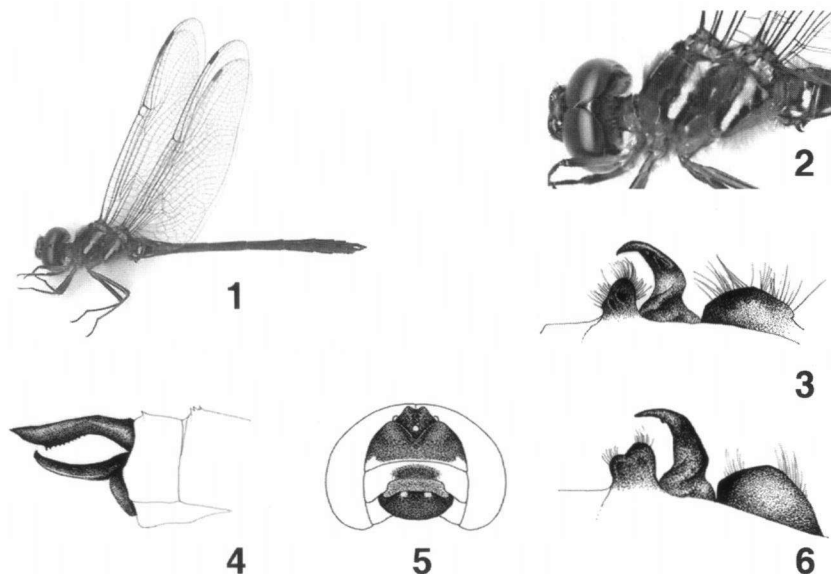
Seven *Brechmorhoga archboldi* males were compared with the Kirby's type series, including the lectotype (KIMMINS, 1968: 286) of *B. grenadensis* Kirby; and three males and two females of *B. praecox* (Hagen) from MEXICO: 1 ♂, Veracruz, VIII-1976, R.W. Garrison leg.; 1 ♀, Ciudad Victoria, Tamaulipas, 26-VII-1968, R.W. Garrison leg.; VENEZUELA: 1 ♂, Carabobo, 6-VII-1958, E.R. Oxburgh leg.; TRINIDAD: 1 ♀ trib. Oropuche, 13-IV-1965, T.W. Donnelly leg.; 1 ♂, trib. Oropuche, 17-IV-1965, T.W. Donnelly leg.

DESCRIPTION OF THE MALE

Figures 1-5

Material. – 5 ♂, Pigeon, Bouillante, Basse-Terre, 11-II-2006, Meurgey F. leg.; – 2 ♂, Rivière Bras David, Basse-Terre, 13-III-2002, G. Weber leg.; – 6 ♂, 4 ♀, Guadeloupe, Basse-Terre, Rivière Bras-David, 6-IV-2004, F. Meurgey leg.; – 2 ♂, Martinique, Rivière Blanche, VI-2005, F. Meurgey leg.

MALE. – **Head.** – Eyes in life dark royal blue with a reddish-blue tinge dorsally (Fig. 1). Labrum deep glossy purple with two pale spots anteriorly. Anteclypeus gray-brown. Postclypeus glabrous, pale blue-green; dark ventrally and covered with black setae. Frons bituberculate, glossy-purple, but pale ventrally (Fig. 5). Occiput brownish-black in the first half, then glossy purple.



Figs 1-6. *Brechmorhoga archboldi* (Figs 1-5) and *B. grenadensis* (Fig. 6): (1) mature male, lateral view; – (2) thorax; lateral view; – (3) hamule and genital lobe, lateral view; – (4) caudal appendages; lateral view; – (5) head, frontal view; – (6) hamule and genital lobe, lateral view.

T h o r a x. – Similar to female. Pronotum obscurely dark brown with conspicuous covering of dark hairs. Prothorax brownish-black with four pale thoracic stripes as follows (Fig. 2): a thin antehumeral stripe expanded dorsally as an inverted “L”; a broad lateral mesepisternal; a narrow metepisternal which is wider and rounded below; a broad metepimeral, rounded below and occupying center of metepimeron. Sides of thorax brown, darker to black along borders of pale thoracic stripes, and densely clothed with black hairs. Dorsum of thorax between wings sometimes with yellowish spots, which become obscured with age.

Legs. – Trochanter and coxae pale brown. Anterior femur brown, blackish at apex, tibiae and tarsi black. Basal half of mesothoracic femur pale brown. Metafemur almost entirely dark brown, distal half black. Tibiae and tarsi black. 12 short, stout proximally directed spines on outer margin of metafemora, 9 regularly shaped with the distal 3 clustered.

Wings. – Venation similar to female. Hyaline, sometimes tinged with amber along the front margin in fore wings and from base to nodus in hind wings. Pterostigma black.

A b d o m e n. – Black, obscure dark brown, paler on the ventral side of segments 1-3, and pale as follows: segment 2 with two whitish dorsolateral spots, and two small posteroventral greenish J-shaped spots; segment 3 with a ventero-lateral greenish stripe along tergal margin, a dorsolateral stripe often interrupted as an inverted “!”. Segments 4-6 each with small white or yellowish dorsolateral streaks basally, becoming obscure in old males. Segment 7 with wider dorsolateral pale stripe, about $\frac{1}{2}$ length of segment. Segments 8-10 all black. Abdomen nearly cylindrical with segments 7-8 only slightly expanded. Genital lobes narrow, truncate and slightly pointed anteriorly. Hamule nearly straight, abruptly curved posteriorly as an acute spine (Fig. 3). Caudal appendages black. Cercus ventrally with a row of denticles with the last two denticles the longest (Fig. 4).

VARIATION AMONG SPECIMENS. – Total length (mm): 45.0-47.0; abdomen: 33.0-34.0; forewings 32.0-34.0; hindwings: 31.0-33.0.

DESCRIPTION OF EXUVIAE

Figures 7-12

M a t e r i a l. – 30 larvae and 7 exuviae (reared). GUADELOUPE: Rivière Bras David, Basse-Terre, 29-III-2004, F. Meurgey leg.; – MARTINIQUE: Trois-Ilets, 17-III-2005, F. Meurgey leg.

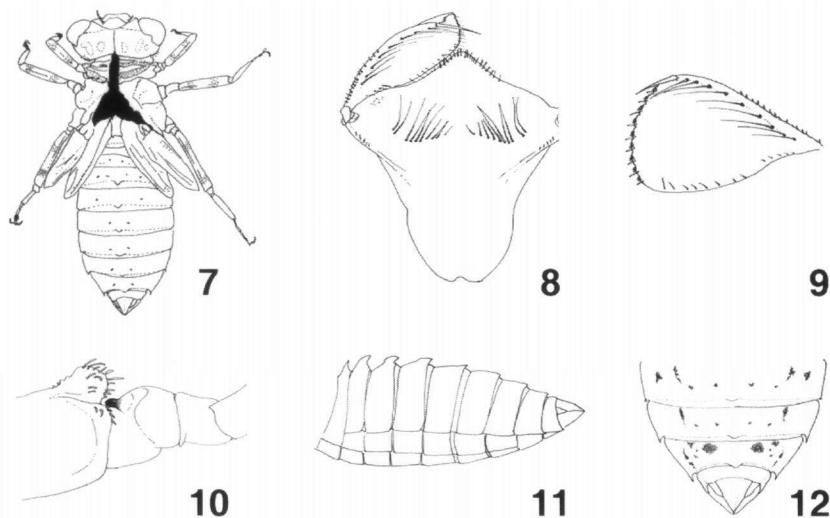
DESCRIPTION. – Exuviae yellowish to light brown (Fig. 7) with diffuse black markings on dorsum. Body robust, legs short. Integument granulose with peg-like setae and black dots.

H e a d. – Trapezoidal, twice as wide as long, wide as pronotum. Some small setae on the lateral margins and ventral side of occiput. Eyes bulging, well developed laterally, surpassing occipital margins. Occiput small, sides convergent pos-

teriorly, posterior margins nearly straight. Mask (Fig. 8) broad and short, spoon-shaped. Mentum/prementum articulation reaching the median coxae. In dorsal view, median lobe (Fig. 8) with two rows of 10-11 premental setae, arranged as follows: 2 external long setae separated from an internal group of 4 very long setae, followed by a group of 4-5 medium sized setae. Sides of the mentum with numerous short setae. Labial palp (Fig. 9) with 8-10 setae and numerous short setae on the margin. Movable hook long and acute. Distal margin of labial palp with ten angulate teeth on opposed edges, the first 5 strong and rounded, the remaining teeth minute. Each tooth with 4 (rarely 3) raptorial setae, of which the inferior is always the longest. Distal margin of mentum bluntly pointed with numerous short, spatulate setae.

T h o r a x. – Lateral margin of proepimeron concave (Fig. 10). Wing cases reaching abdominal segment 5 on last instar. Legs strong and short marked with faint black rings. Last segment of tarsi black.

A b d o m e n. – In dorsal view, parallel sided on segments 5-7. Dorsal spines present. Spine on segment 2 vertical and acute. Spine on segment 3 the longest, acute and slightly directed posteriorly. Spine on 4 the largest, less elevated and strongly directed posteriorly. Spine on segment 5 directed posteriorly; spine on 6-9 short, gradually decreasing in height, each forming a flat, triangular, vestigial tubercle (Fig. 11). Lateral spines present on segments 8 and 9. Segment 8 spines small, parallel to margin of body; segment 9 spine small, slightly divergent from the side of its segment (Fig. 12). Dorsal surface of granulate abdomen with black dots.



Figs 7-12. *Brechmorhoga archboldi*, larva: (7) general aspect, dorsal view; – (8) labium, dorsal view; – (9) right palpal lobe margin, dorsal view; – (10) right foreleg, proepimeron, dorsal view; – (11) dorsal hooks, lateral view; – (12) last abdominal segments, dorsal view.

Epiproct and paraprocts subequal with cercus reaching midlength of epiproct.

M e a s u r e m e n t s . — Total length (excluding antennae): 19.0-21.0 mm.

BIONOMICS

Brechmorhoga archboldi frequents lotic habitats. It typically breeds in fast flowing montane rivers, generally with rocky beds, at 200-600 meters altitude. Away from the water, fully mature and teneral individuals can be found hawking along clearings and mountain tracks or roads, from 100 meters to over 1000 meters altitude. At breeding sites, both sexes patrol over 5-6 meters above the water or along the banks. They rarely perch and generally do so pendantsly on the tips of small branches at 4-5 meters height. Females fly inconspicuously under forest near the shoreline. In its habitat, *Argia concinna* (Rambur), *Macrothemis* sp., and *Dythemis sterilis* (Hagen) are common companion species.

Exuviae of *B. archboldi* were most commonly found on rocky surfaces exposed to flowing water. Exuviae were scarce, probably because the splashing current soon carries them away. Emergence takes place in the early morning, usually 8 cm or less on the rocks. *B. archboldi* is thus far known only from Guadeloupe and Martinique in the French West Indies, and from Dominica in the British West Indies.

DISCUSSION

Brechmorhoga archboldi is related to *B. praecox* (Hagen). GARRISON & VON ELLENRIEDER (2006) keyed females of *B. archboldi* in the *praecox* group as follows (differences for *B. praecox* in parentheses): vulvar lamina deeply cleft with lateral lobes divergent (parallel), labrum dark (pale), and abdomen equal to or only slightly longer than hindwings (considerably longer).

B. archboldi males can be separated from *B. praecox* males by the following combination of characters: labrum dark (pale), abdomen equal or slightly longer than hindwings (considerably longer), cerci with a strong ventral tooth following a series of small teeth (all small and subequal), genital lobe narrow, truncate, and slightly pointed anteriorly (broad and slightly bilobed), pale narrow spot on segment 7 occupying at most the basal half of segment length (wider, occupying 2/3 of basal segment).

The larva closely resembles *B. praecox*, but differs as follows: (1) 8-10 setae on labial palps (7 on *B. praecox*); (2) two rows of 13 premental setae (two rows of 9 premental setae in *B. praecox*) and (3) proepimeron concave (straight in *B. praecox*).

Adults of *B. archboldi* are also similar to those of *B. grenadensis* described from Grenada (KIRBY, 1894). We compared specimens from Guadeloupe with Kirby's type series of *B. grenadensis* in the NMNH (London). This study revealed differences in the shape of the caudal appendages and second copulatory organs (hamule and genital lobe), showing *B. grenadensis* to be more similar to *B. prae-*

cox than to *B. archboldi*. GEIJSKES (1932), following RIS (1913), mentioned *B. praecox grenadensis* from Trinidad. We compared specimens from Trinidad with *B. grenadensis* from Kirby's collection and, following Donnelly (in litt.), concluded that this could be rejected, thus making specimens from Trinidad, *B. praecox*.

B. archboldi differs from *B. grenadensis* (differences for *B. grenadensis* in parentheses) in having a narrow, truncate genital lobe (broad and bilobed [Fig. 6]), toothless hamule (hamule with a small tooth), and a black labrum (pale). More material from Trinidad and Grenada is needed in order to understand this complex of taxa. We hope to conduct additional research and record the findings in a future publication.

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REFERENCES

- DONNELLY, T.W., 1970. The Odonata of Dominica, British West Indies. *Smithson. Contr. Zool.* 37: 1-20.
- GARRISON, R.W. & N. VON ELLENRIEDER, 2006. Generic diagnoses within a closely related group of genera: Brechmorhoga, Gynothemis, Macrothemis, and Scapanea (Odonata: Libellulidae). *Can. Ent.* 138: 269-284.
- GEIJSKES, D.C., 1932. The dragonfly fauna of Trinidad in the British West Indies (Odonata). 2. Anisoptera. *Zool. Meded.* 15(1-2): 96-128.
- GOYAUD, C., 1994. Contribution à l'inventaire des odonates du département de la Guadeloupe. *Martinia* 10(3): 49-61.
- GRAND, D., 1996. Sur quelques libellules des Antilles françaises. *Sympetrum* 9: 41-46.
- HOFMANN, C., 1999. *Biodiversité des éphéméroptères et des odonates de la Guadeloupe, et biotypologie des cours d'eau de la Basse-Terre*. Travail de diplôme. Univ. Lausanne (Mus. Zool.) & Univ. Genève (Lab. Ecol. Biol. Aquat.).
- KIMMINS, D.E., 1969. A list of the type-specimens of Libellulidae and Cordulidae (Odonata). *Bull. Br. Mus. (Nat. Hist.) Ent.* 22(6): 277-305.
- KIRBY, W.F., 1894. On some small collections of Odonata recently received from the West Indies. *Ann. Mag. nat. Hist.* 6(14): 261-269.
- NEEDHAM, J.G., M.J. WESTFALL & M.L. MAY, 2000. *Dragonflies of North America*. [Revised edn]. Scient. Publishers, Gainesville, FL.
- RIS, F. 1913. Neuer Beitrag zur Kenntnis der Odonatenfauna von Argentina. *Mem. Soc. ent. Belg.* 22: 55-102.
- STARMÜHLNER, F. & Y. THEREZIEN, 1982. Résultats de la mission hydrobiologique austro-française de 1979 aux îles de la Guadeloupe, de la Dominique et de la Martinique (Petites Antilles). 2. Etude générale de la Dominique et de la Martinique. *Revue Hydrobiol. trop.* 15(4): 325-345.