

A new species of *Buenoa* (Heteroptera: Notonectidae) from Minas Gerais (Brazil)

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Abstract: *Buenoa oreia* spec. nov. from Brazil is described and a key to males and females of the larger South American species *Buenoa* is provided.

Keywords: *Buenoa*, new species, key, Minas Gerais, South America.

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Introduction

Within the framework of preparing and completing keys to the water bugs of Minas Gerais, of which a first provisional edition meant as a work document, is to be published soon (Nieser & Lane de Melo, in press) the following undescribed species of *Buenoa* Kirkaldy has been found. Most of the material has been collected by the authors but some additional material from a study of the fauna of the basins of the rivers São Francisco and Doce by L. Rocha (Institute of Biological Sciences, Federal University of Minas Gerais) has been included.

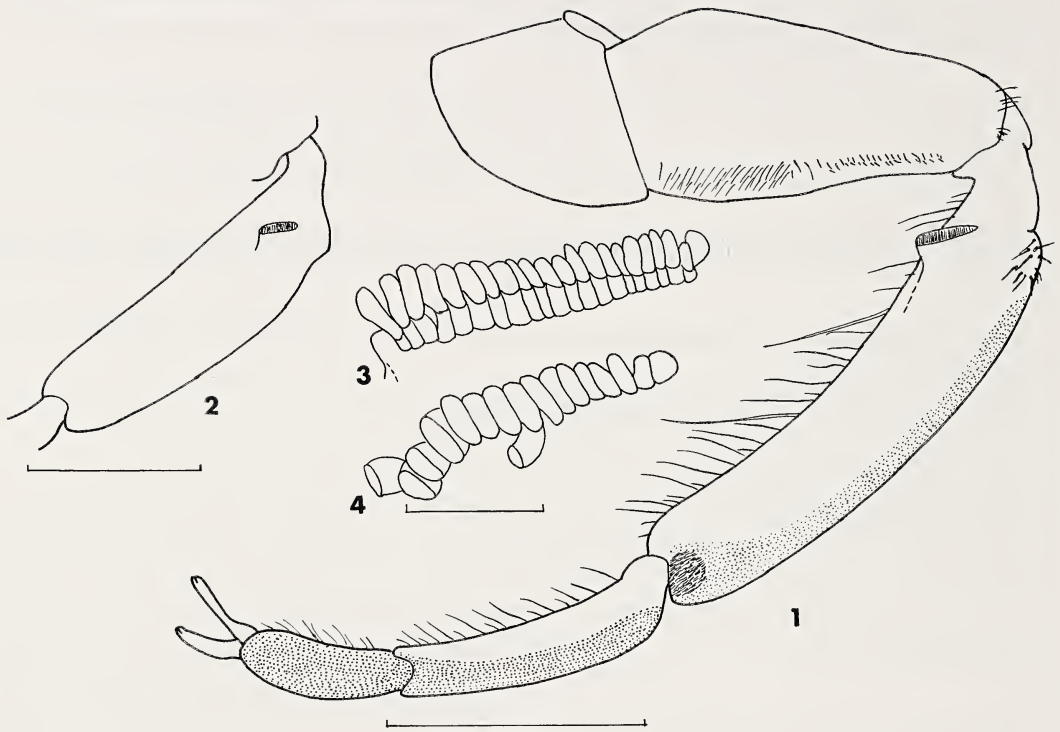
The genus *Buenoa* was split off from the genus *Anisops* Spinola by Kirkaldy (1904) and includes the New World species of the subfamily Anisopinae. Apart from the geographical separation the difference is that males of *Buenoa* have 2-segmented front tarsi whereas males of *Anisops* have 1-segmented tarsi.

There are about 50 described species of *Buenoa* with the greatest number of species per area in the lowlands of tropical South America (Truxal, 1953; Nieser, 1975). Anisopinae belong to the few insects that have haemoglobin, which they use to store oxygen. It frees the air

bubble they carry during a dive for another purpose, namely maintaining neutral buoyancy. With the Chaoborinae (Diptera: Culicidae) larvae the Anisopinae are among the few really planktonic insects. As a consequence of this way of life Anisopinae are inhabitants of waters with no or very low current.

Measurements are in mm and are based on five specimens of each sex, if possible randomly chosen from the sample containing the holotype, and are presented as the actual range of the measurements in some cases followed by the sample mean \pm its standard deviation. The body length is measured from the anterior point of head to the caudal apex of hemelytra in dorsal view.

Depositories are indicated as registered in Arnett et al. (1993): DPIB (Departamento de Parasitologia, Instituto de Biologia, Belo Horizonte, Minas Gerais, Brazil), JTPC (J. T. Polhemus collection, Englewood, Colorado, USA), LACM (Los Angeles County Museum, California, USA), MUDH (Museon, Den Haag, The Netherlands), MZSP (Museu Zoológico, São Paulo, Brazil), NHMW (Naturhistorisches Museum, Wien, Austria), RMNH (Nationaal Natuurhistorisch Museum, Leiden, The Netherlands), SEMC (Snow Entomologi-



Figs 1-4. *Buenoa oreia* spec. nov., paratype ♂. 1, foreleg, inner view, spotted area indicating dense pilosity (scale 1 mm); 2, caudal view of fore tibia (scale 1 mm); 3-4, tibial comb; 3, specimen from Serra do Cipó; 4, specimen from Serra da Canastra (scale 0.1 mm).

cal Collections, Lawrence, KS, USA), ZMAN (Zoölogisch Museum, Amsterdam, The Netherlands). Not registered: NCTN (Nieser collection, Tiel, The Netherlands).

Abbreviations used: brach. = brachypterous, macr. = macropterous.

Buenoa oreia spec. nov.

(figs 1-6, 8, 10-11)

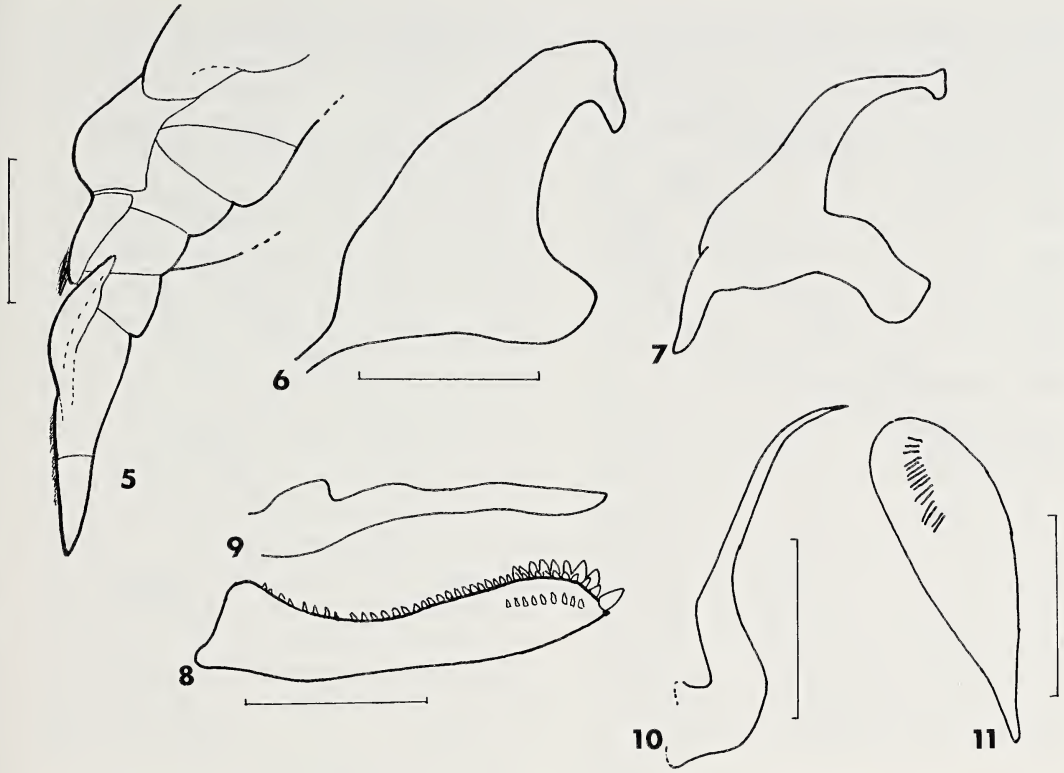
Type material

Holotype: brach. ♂, Brazil, Minas Gerais, Serra do Cipó (19°20'S, 43°30'W) Basin of Rio Doce, ± 1100 m a.s.l., livre [free swimming], Aug. 1993, leg. L. Rocha (MZSP). Paratypes: 6 ♂, 6 ♀, all brach., same data as holotype (MZSP: 1 ♀ allotype; DPIB: 2 ♂, 3 ♀; NCTN: 1 ♂, 2 ♀; LACM, SEMC, ZMAN: 1 ♂ each); Sa. do Cipó, 8.i.1995, leg. A. Lane de Melo (ALM 95001), 1 ♀ brach., 1 ♂, 1 ♀ macr. (DPIB); Sa. do Cipó, pond in dry bed of stream, km 123 (along road), 6.i.1996, leg. A. Lane de Melo (ALM

96001), 1 ♂, 11 ♀ macr. (DPIB: 2 ♀; NCTN: 1 ♂, 1 ♀; JTTC, LACM, MUDH, NHMW, RMNH, SEMC, ZMAN, ZMSP: 1 ♀ each); Minas Gerais, S. Roque de Minas, at foot of waterfall NE side of Serra da Canastra, 27.iii.1996 (20°15'12"S, 46°24'24"W), leg. N. Nieser & A. Pelli (N9637), pond and marsh with poids, water clear light brown (humous colloids) bottom, boulders, at quiet places sand in which poids root, water in pond nearly stagnant, downstream with variable current, 23 ♂, 7 ♀ brach. (JTTC: 2 ♂, 1 ♀; MUDH: 1 ♂; RMNH: 1 ♂; NCTN: remaining specimens).

Description

Brachypterous form. Dimensions. Body length ♂: 9.20-9.90 (9.59 ± 0.26), ♀: 8.70-9.90 (9.40 ± 0.43); width of head ♂: 2.28-2.40 (2.37 ± 0.05), ♀: 2.12-2.42 (2.25 ± 0.12); anterior width of vertex ♂: 0.31-0.35, ♀: 0.28-0.40; synthlipsis ♂: 0.21-0.25, ♀: 0.20-0.32; width of pronotum ♂: 2.25-2.38, ♀: 2.10-2.40; maximal width (slightly caudal of apex



Figs 5-11. *Buenoa* sp. 5-6, *Buenoa oreia* spec. nov., paratype ♂; 5, rostrum, lateral view (scale 0.5 mm); 6, left paramere (scale 0.25 mm); 7, *Buenoa distincta* Truxal, left paramere (after Truxal, 1953); 8, *Buenoa oreia* spec. nov., paratype ♀, ovipositor, lateral view (scale 0.25 mm); 9-10, *Buenoa*, spine from caudo-sinistral margin of seventh abdominal tergite of ♂; 9, *B. distincta* (after Truxal, 1953); 10, *B. oreia* spec. nov., paratype (scale 0.25 mm); 11, *Buenoa oreia* spec. nov., paratype ♀, inner surface of metatrochanter with stridulatory area (scale 0.25 mm).

of scutellum) ♂: 2.58-2.80, ♀: 2.50-2.76.

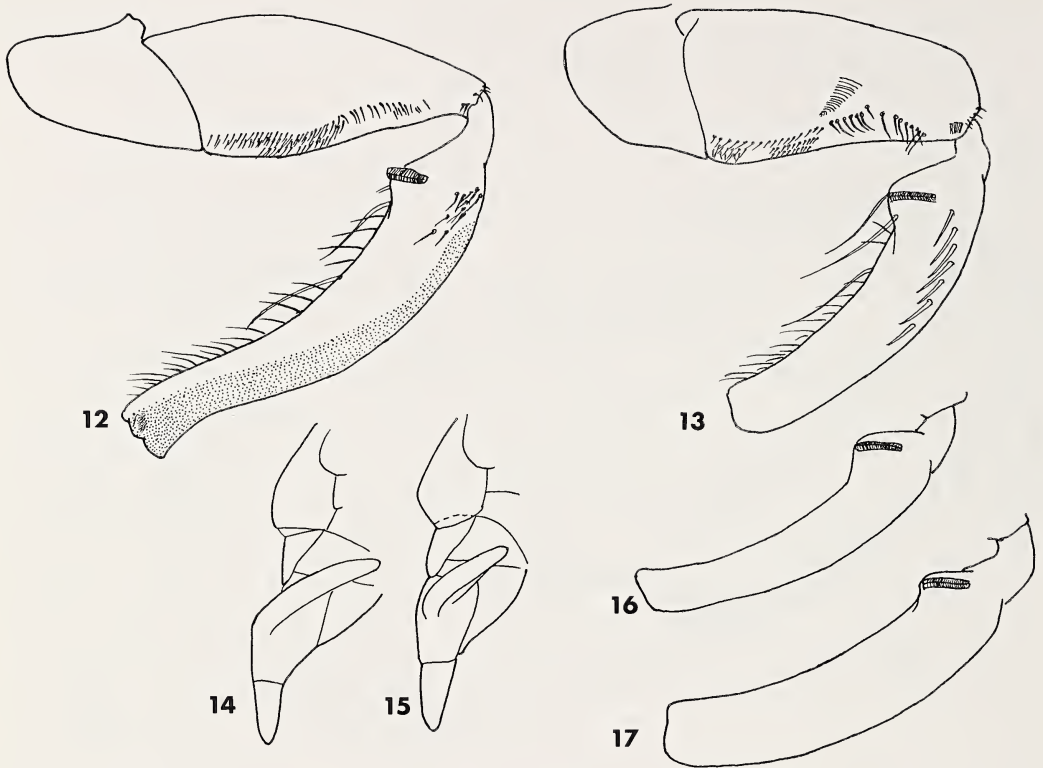
Colour. In dorsal view generally sordid white, eyes dark grey to blackish; dorsum of abdomen, venter (except some lighter patches on connexival segments in some specimens), longitudinal stripes and most of pilosity on legs dark brown to black. Hemelytra hyaline with dark smoky stripes along costal margin, at margin of corium and membrane and at margin of corium and clavus.

Greatest width of head subequal to slightly wider than pronotum; synthlipsis wide, about two thirds the anterior width of vertex; tylus distinctly inflated, labrum 1.2 times as wide as long, with acute apex and a distinct tuft of dark bristles; anterior face of rostrum and ventral part of frons (above tylus) with some bristles. Median length of pronotum less than half its width (1.00:2.33), disc unimpressed.

Scutellum small, two thirds as long as wide, its median length about 1.3 times as long as median length of pronotum.

Hind leg. Trochanter with a small elongate stridulatory area consisting of 12-15 ridges on inner surface (fig. 11), inner face of femur ventrally with 32-40 small, distally slightly larger setae in the ventral row and about 16 distinctly larger setae in the dorsal row.

Male structural characteristics. Outline of head from above laterally slightly convex, anteriorly truncate with vertex indented; greatest width of head nearly seven times the anterior width of vertex; along median longitudinal axis head nearly three quarters the length of pronotum (0.8:1.1); rostral prong (fig. 5) about two thirds the length of third rostral segment, with base originating laterally near proximal end of third rostral segment, with



Figs 12-17. *Buenoa* sp. 12-13, *Buenoa*, ♂, fore femur and tibia; 12, *B. machrisi* Truxal (after Truxal, 1957; spotted area indicating dense pilosity); 13, *B. femoralis* (after Truxal, 1953); 14-15, *Buenoa*, ♂, rostrum, lateral view (after Truxal, 1953); 14, *B. femoralis*; 15, *B. antigone antigone*; 16-17, outline of fore tibia of ♂ *Buenoa* (after Truxal, 1953); 16, *B. antigone antigone*; 17, *B. ida*.

apical part somewhat narrowed and apex narrowly rounded. Pronotum with lateral margins hardly divergent posteriorly, posterior margin slightly convex, medially concave. Fore leg (fig. 1) femur somewhat narrowed at apex, without stridulatory area; tibia proximally broadened, stridulatory comb with 15-25 teeth; inner face of tibia and tarsus with dense dark rough pilosity, tibia apically with a field of finer shorter pale hairs, outer tarsal claw slightly thicker than inner. Middle leg, proximal part of femur with a swelling accentuated by a tuft of short bristles; tibia broad, its width about a quarter of its length with thick pilosity on inner surface. Parameres normal. Spine from caudo-sinistral margin of seventh abdominal tergite with apical half narrow, curved and strongly acuminate (fig. 10).

Female structural characteristics. Outline

of head from above laterally nearly straight, slightly diverging posteriorly, anteriorly truncate with vertex indented at its lateral margins; greatest width of head six times the anterior width of vertex; along median longitudinal axis length of head four fifth the length of pronotum. Lateral margins of pronotum posteriorly divergent, posterior margin nearly straight, medially concave. Ovipositor of normal shape (fig. 8), with a row of pegs along the entire dorsal margin in addition about 10 larger pegs apically placed slightly inward and a row of about 20 smaller pegs in the middle of apical part of outer surface.

Macropterous form. Dimensions (only 2 ♂ available). Length ♂: 9.60, ♀: 9.10-9.45 (9.25 ± 0.15); width of head ♂: 2.25-2.30, ♀: 2.12-2.20 (2.16 ± 0.030); anterior width of vertex

♂: 0.26-0.30, ♀: 0.32-0.35; synthlipsis ♀: 0.22-0.26; humeral width of pronotum (= maximal width) ♂: 2.61-2.70, ♀: 2.51-2.60 (2.53 ± 0.038).

Colour. Blackish in dorsal view, notencephalon and anterior two thirds of pronotum pale. Ventral side blackish with dark stripes on legs larger than in brachypterous specimens. Hemelytra with a broad band along costal margin, inner half of clavus, distal third of corium and proximal third of membrane shining black. Hind wings with a large blackish patch distally (in rest under the hyaline part of membrane).

Structural characteristics. Essentially as in brachypterous form but head along median longitudinal axis five sixth the length of pronotum (1.0:1.2); pronotum slightly more than twice as wide as long (2.6:1.2) and wider than head. Scutellum large, 1.3 times as long as pronotum (1.6:1.2) and about 1.4 times as wide as long (2.2:1.6). Hemelytra with claval suture and membrane distally of membranal fold fully developed.

Etymology

The name is derived from the Greek adjective oreios, meaning mountainous or “living in the mountains”, referring to the habitat where the species has been found.

Comparative notes

Related to *Buenoa machrisi* Truxal from Veadeiros in Goiás. The key presented below will serve to sort out the larger South American species of *Buenoa*.

Brachypterous specimens in the samples from Serra do Cipó are larger than those in samples from Serra da Canastra: 9.69 ± 0.15 (n=4) against 9.12 ± 0.14 (n=5) in males and 9.40 ± 0.43 (n=5) against 8.73 ± 0.17 (n=5) in females. Size variation between isolated populations of *Buenoa* species has been noted before (Nieser, 1967). In addition there are slight differences in the male tibial combs (figs 3-4), which in the Serra do Cipó populations have some more teeth (22 on average), and are slightly broader and arranged more regularly.

In the Serra da Canastra sample the mean number of teeth is 18 and they are slightly narrower and more irregular. This may turn out to be a (sub)specific difference, but in our opinion this should be verified with more samples, especially from the Serra da Canastra area.

There are ten species of *Buenoa* in which males reach a length of over 8 mm. There seems to be a gap in size, as the remaining species of the genus at most reach just over 7 mm. The border case is *B. antigone* (Kirkaldy), which measures 7.8-9.8 mm. However, males of the South American subspecies *B. antigone antigone* only very rarely reach 8 mm. Of these large species five are South American, one is Antillean, four are from the southern part of the United States of America and Mexico, and one is only known from Mexico by its holotype. A key to this last one and the South American species is presented below. Females in *Buenoa* lack characteristic structures, so the key for females is based on measurements and ratios thereof and should be considered preliminary.

Key to South American species of *Buenoa* longer than 8 mm

Males

- 1 Fore femur with a stridulatory area (fig. 13) 2
- Fore femur without a stridulatory area (fig. 12) 4
- 2 Greatest width of head approximately seven times the anterior width of vertex; length ...of head along median longitudinal axis at least half the length of pronotum, rostral prong 1.5 times as long as third rostral segment (fig. 14). Distribution: Puerto Rico?, Brazil (Paraná) and Peru (Ayacucho) *B. femoralis* (Fieber)

Remark: The occurrence in “Puerto Rico” is based on the holotype which is from “Porto Rico”. There is a small town on the banks of R. Paraná in the state of Paraná which is named Porto Rico, so it is probable that the type was collected there and not at the island of Puerto Rico, where this large species has never been found again.

- Greatest width of head six times or less the anterior width of vertex; along median longitudinal axis length of head one third the length of pronotum, rostral prong only slightly longer than third rostral segment (fig. 15) 3
- 3 Pronotum almost unimpressed, not tricarinate; length of fore femur two times the width at apex; length of fore tibia 7 times its apical width (fig. 17), tibial comb with about 25 teeth. Distribution: Mexico, Guatemala and Uruguay *B. ida* Kirkaldy

Remark: The record from Uruguay is based on two specimens including the neotype in the Kirkaldy collection and needs confirmation.

- Pronotum with impressions forming three low longitudinal carinae; length of fore femur three times or more its apical width; length of fore tibia about 10 times its apical width (fig. 16), tibial comb with about 45 teeth. Distribution: Mexico through Central America to Paraguay and Argentina *B. antigone* Kirkaldy

Remarks: There are two subspecies, *B. antigone antigone* occurring in East and South Mexico (Tamaulipas, Veracruz, Campeche and Chiapas) through the Antilles to South America and *B. antigone carinata* (Champion) from Mexico, Guatemala and Belize. Records from the U.S.A. appear to have been erroneous as the species is not mentioned by Polhemus & Polhemus (1988). *Buenoa antigone antigone* is the smaller subspecies: males rarely reach a length just over 8 mm.

- 4 Synthlipsis slightly less than half the anterior width of vertex, left paramere and spine from caudo-sinistral margin of seventh abdominal tergite of aberrant shape (figs 7, 9). Distribution: Mexico (Acapulco) *B. distincta* Truxal

Remark: Only known by the male holotype. As its nearest relative, *B. hungerfordi* Truxal occurs in the South of the U.S.A. and the North of Mexico it is likely that this species also has a more northern distribution

- Synthlipsis half or more the anterior width of vertex, left paramere and spine from caudo-sinistral margin of seventh abdominal tergite of normal shape (figs 6, 10) 5
- 5 Synthlipsis about half the anterior width of

- vertex, fore tibia three times as long as its width at level of the tibial comb, anterior margin anteriorly concave at apex (fig. 12). Distribution: Brazil (Goiás) *B. machrisi* Truxal
- Synthlipsis about two thirds the anterior width of vertex, fore tibia less than two times as long as its width at level of the tibial comb, anterior margin straight at apex (figs 1-2). Distribution: Brazil (Minas Gerais) ... *B. oreia* spec. nov.

Females

- 1 Along median longitudinal axis the head is less than half as long as pronotum 2
- Along median longitudinal axis the head is at least about half as long as pronotum ... 3
- 2 Length 8.2-8.5 mm, length of head one third the length of pronotum, ovipositor with about 4-5 very small tooth-like setae laterally near apex *B. antigone*
- Length over 9 mm, length of head one fourth the length of pronotum, ovipositor with about 7-8 small tooth-like setae laterally near apex *B. ida*
- 3 Along median longitudinal axis the head is about four fifths as long as pronotum *B. oreia* spec. nov.
- Along median longitudinal axis the head is about half as long as pronotum 4
- 4 Metatrochanter with a small stridulatory area on its inner surface *B. machrisi*
- Metatrochanter without stridulatory area ... *B. femoralis*

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