

THE SMALL SPECIES OF *BELOSTOMA* (HETEROPTERA, BELOSTOMATIDAE). I. KEY TO SPECIES GROUPS AND A REVISION OF THE DENTICOLLE GROUP

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ABSTRACT

A key to species groups of the genus *Belostoma* Latreille, 1807, using new taxonomic characters are presented as well as the revision of the four species included in the *denticolle* group: *B. denticolle* Montandon, 1903, and three new species: *B. orbiculatum* from eastern Argentina and southern Brazil, *B. retusum* from eastern Argentina and *B. amazonum* from northern Brazil which are described and illustrated.

KEYWORDS. *Belostoma*, small species, revision, *denticolle* group.

INTRODUCTION

The giant water bug genus *Belostoma* Latreille, 1807, which is Panamerican in distribution, is presently known by about 65 species. Although numerous contributions on taxonomy of the genus are available, those with a monographic criterion are scarce in the last 40 years (DE CARLO, 1938; LAUCK, 1962, 1963, 1964; SCHNACK, 1976). LAUCK (1962) proposed 16 species groups on the basis of the male genitalia and recognized three size categories: large or moderately large species (26.0 to 50.0 mm in length), medium size species (15.5 to 26.0 mm in length) and small species (9.5 to 22.0 in length). Lauck's monograph was published in three papers (LAUCK, 1962, 1963, 1964) where he treated large and medium sized species; and named *pygmeum*, *denticolle*, *oxyurum* and *plebejum* as small species groups, but he did not include any species within them.

The purpose is to offer a new vision of the generic species group composition, based on the treatment of new characters (measure of suture anteclypeus-maxillary plate, measure of suture anteclypeus-loral plate and abdominal pilosity) in combination with the ones anteriorly used. As a result five small species groups are here recognized: *triangulum*, *minor*, *oxyurum*, *plebejum* and *denticolle*. The revision of the last mentioned one is also treated here, recognizing three new species.

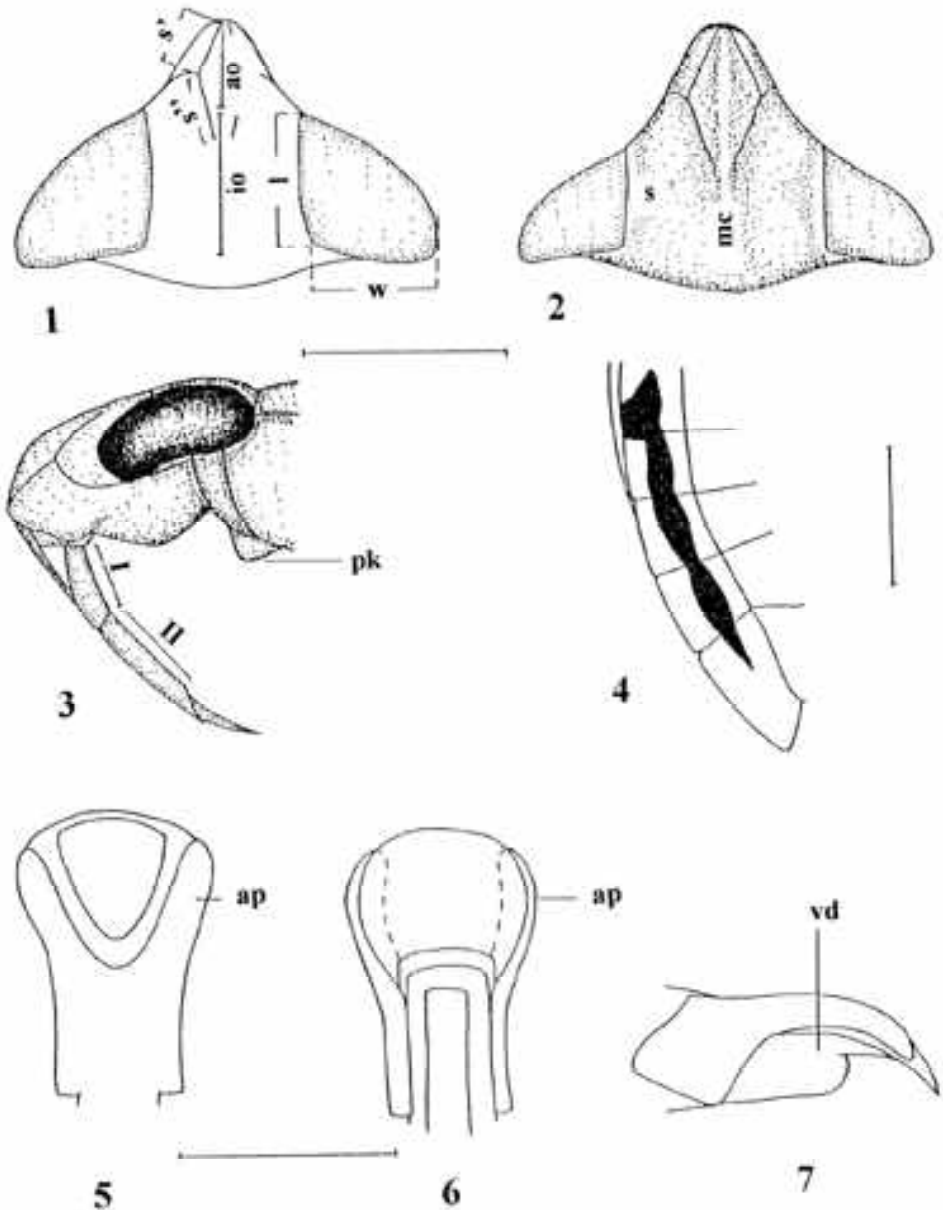
MATERIAL AND METHODS

The examined material was borrowed by the following institutions: Francis Huntington Snow Entomological collections, Kansas University, Lawrence (KU); Los Angeles County Museum, Los Angeles (LACM); National Museum of Natural History, Washington D.C. (USNM); The Natural History Museum, London (BMNH); John T. Polhemus collection, Denver (JTPC). The specimens were softened in hot water during 15 minutes in order to remove the genital capsule helped with a pin.

Taxonomic characters: length and width are here presented in mm. Suture anteclypeus-maxillary plate (s') and suture anteclypeus-lorum (s''), both measured on dorsal view (fig. 1). Antecolus (ao), measured from anterior margin of the eyes to anterior tip of the head (fig. 1). Intercolus (io), portion between anterior and

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Figs. 1-7. *Belostoma* sp.: 1, 2, head, dorsal and ventral view (ao, anteoculus; io, interoculus; l, length of eye; mc, median carina; s, sulcus; s', suturae anteclipeus-maxillary plate; s'', suturae anteclipeus-loral plate; w, width of eye; 3, head, lateral view (I, first segment of the beak; II, second segment of the beak; pk, prosternal keel); 4, abdominal pilosity; 5, male genitalia, dorsal view; 6, ventral; 7, lateral (ap, arms of phallobase; vd, ventral diverticulum). Scale lines: 2 mm, figs. 1-3; 3 mm, fig. 4; 1 mm, figs. 5, 6.

posterior margins of eyes (fig.1). Width and length of the eyes were measured (fig. 1). Sulcus (s), a depression along internal margin of the eye (fig. 2). Median carina (mc), longitudinal keel along midline of the head (fig. 2). Beak, lengths of first (I) and second (II) visible segments were measured (fig.3). Prosternal keel (pk), shows three different forms: rounded (prominent or not prominent), acutely pointed (with the anterior margin straight) or triangular shaped (fig. 3). Pilosity, band of hairs that covers part or the entire surface of ventral laterotergites, never covering their outer margin (fig. 4). This stripe was briefly mentioned by DE CARLO (1930) and LAUCK (1962). Nevertheless, they used it as diagnostic in specific recognition only in a few species. Pubescence, short hairs covering part or the entire surface of abdominal sternites. Male genitalia, phallobase (pb) and ventral diverticulum (vd) (figs. 5-7).

Key to the groups of the species of *Belostoma*

1. Pilosity covering entirely ventral laterotergites 2
 Pilosity covering part of ventral laterotergites 6
2. North american species *B. flumineum* group
 South american species 3
3. Pubescence covering part or all of abdominal sternites 4
 Pubescence not on abdominal sternites 5
4. Eyes triangular *B. bergi* group
 Eyes globular *B. testaceopallidum* group
5. Large, dilated species, more than 30.0 mm long *B. dilatatum* group
 Less than 30.0 long *B. bifoveolatum* group
6. Pronotum and scutellum with a distinct median carina *B. aurivilianum* group
 Pronotum and scutellum without median carina 7
7. Outer margin of eye straight, eye triangular 8
 Outer margin of eye rounded, eye globose 9
8. Segment I of the beak longer than II *B. bergi* group
 Segment I of the beak shorter than II *B. discretum* group
9. Small species, less than 24.0 mm long; segment I of the beak shorter than II ... 10
 Larger species, more than 28.0 mm long; segment I of the beak longer or equal to II 14
10. Prosternal keel rounded or acutely pointed, projecting anterad 11
 Prosternal keel triangular shaped, not projected anterad *B. triangulum* group
11. Pilosity covering more than half of ventral laterotergites 12
 Pilosity covering half or less of ventral laterotergites 13
12. Sulcus covered with short and dense pilosity that extends from behind eyes to lorum *B. minor* group
 Sulcus covered with short and scattered pilosity that extends along eyes *B. oxyurum* group
13. Prosternal keel rounded or with the anterior margin straight, not projected anterad; pilosity slightly developed *B. plebejum* group
 Prosternal keel acutely pointed or rounded projected anterad; pilosity well developed *B. denticolle* group
14. Vertex with prominent carina; scutellum not reaching nodal line 15
 Vertex without a median carina; scutellum reaching nodal line 16
15. Clypeus reaching ocular line *B. stollii* group
 Clypeus not reaching ocular line *B. dilatatum* group

16. Ventral diverticulum of male genitalia with a very large distinct apicoventral protuberance *B. dentatum* group
 Ventral diverticulum of male genitalia with moderately apicoventral protuberance *B. subspinosum* group

***Belostoma denticolle* group**

Size: length, 11.0-16.0; width, 5.0-7.0. Shape: ovate. Color: light to dark brown.

Head: suture anteclypeu-maxillary plate as long as suture anteclypeus lorum; maxillary plate compressed or not compressed; anteculus shorter than interoculus; eyes globose, as wide as long or wider than long; segment I of the beak as long or shorter than II. Thorax: prosternal keel prominent, acutely pointed or rounded and projected anterad. Abdomen: pilosity well developed, covering a moderately wide band on ventral laterotergites, slightly constricted between spiracles.

Male genitalia: ventral diverticulum flat, arms of phallobase longer than posterior portion of phallobase.

Observation: this group resembles *oxyurum* group by the flat shape of the male genitalia, but differs in that pilosity is narrower than in *oxyurum* group.

Key to the species of *denticolle* group

1. Prosternal keel acutely pointed, prominent, projecting anterad 2
 Prosternal keel rounded, prominent *B. orbiculatum* sp. nov.
2. Maxillary plate not compressed; prosternal keel strongly developed 3
 Maxillary plate compressed; prosternal keel not strongly developed
 *B. retusum* sp. nov.
3. Suture anteclypeus-maxillary plate slightly longer than suture anteclypeus-lorum
 *B. denticolle* Montandon
 Suture anteclypeus-maxillary plate as long as suture anteclypeus-lorum
 *B. amazonum* sp. nov.

***Belostoma orbiculatum* sp. nov.**

(Figs. 8-10, 20-23)

Size: length, ♂ 13.4-14.6, ♀ 13.55-14.7; width, ♂ 6.7-7.5, ♀ 6.7-7.6. Color: almost uniformly brown. Shape: elliptical (fig. 8).

Head: suture anteclypeus-maxillary plate as long as suture anteclypeus-lorum; maxillary plate not compressed; anteculus shorter than interoculus; eyes globose, as wide as long (fig. 9); segment I of the beak slightly shorter than II (fig. 10). Thorax: prosternal keel prominent, rounded (fig. 10). Abdomen: pilosity slightly developed on penultimate segment (fig. 20).

Male genitalia: arms of phallobase covering lateral margins of ventral diverticulum (figs. 21-23).

Diagnosis. *Belostoma orbiculatum* is easily distinguished from the other species of the group in having the prosternal keel rounded.

Distribution. Southeastern and South Brazil, Argentina and Uruguay.

Types. Holotype ♂, allotype ♀ (KU); 7 paratypes (4 ♂, 3 ♀) labelled "Argentina, Bs. As., Tigre, VI-14-'69, P. & P. Spangler" (USNM); paratype ♂ from Buenos Aires, Argentina (USNM).

Other specimens examined. BRAZIL, **Rio de Janeiro**: Rio de Janeiro, ♀, Wygodzinsky coll. (JTPC); **Santa Catarina**: Nova Teutonia, ♀, VIII.1932/I.1933, Johnk & Holst coll. (JTPC); ♂, XI.1966, Plaumann coll. (LACM). ARGENTINA, **Buenos Aires**: Tigre, 6 ♂, 4 ♀, 14.VI.1969, P. & P. Spangler coll. (USNM); Buenos Aires, ♂ (USNM). URUGUAY, **Cerro Largo**: Sarandí del Quebracho, ♂, XI.1959, Carbonell *et al.* coll. (LACM).

***Belostoma retusum* sp. nov.**

(Figs. 11-13, 24-27)

Size: length: ♂ 11.0-12.0, ♀ 11.5-12.0; width: ♂ 5.0-5.5, ♀ 5.0-6.0 mm. Color: brown. Shape: elliptical, elongate (fig. 11).

Head: suture anteclypeus-maxillary plate as long as suture anteclypeus-lorum; maxillary plate strongly compressed; anteculus as long as interoculus; eyes globose, wider than long (fig. 12); segment I of the beak as long as II (fig. 13). Thorax: prosternal keel acutely pointed, slightly projected anterad (fig. 13). Abdomen: pilosity well developed on penultimate segment (fig. 24).

Male genitalia: arms of phallobase straight not covering lateral margins of ventral diverticulum (figs. 25-27).

Diagnosis. *Belostoma retusum* is easily distinguished from the other species of the group in having the maxillary plate strongly compressed.

Distribution. Villarica (Paraguay) and Manantiales, Corrientes (Argentina).

Types. Holotype ♂, allotype ♀, 22 paratypes (3 ♂, 19 ♀) are labeled: "Paraguay S.A., Villarica, 12-29 1929, F. Schade" (KU); 2 ♂, paratypes, idem (JTPC).

Other specimens examined. PARAGUAY, Villarica, 2 ♂, ♀, XII.1929, Schade coll. (JTPC). ARGENTINA, **Corrientes**: Manantiales, ♀, 15-30.I.1966 (JTPC).

***Belostoma denticolle* Montandon**

(Figs. 14-16, 28-31)

Belostoma denticolle MONTANDON, 1903:362; NIESER, 1975:113; LANZER- DE- SOUZA, 1980:52, 53.

?*Belostoma denticolle*; DE CARLO, 1938:226 (record from Amazonas, questionable).

Belostoma candidulum; DE CARLO, 1957:55 (in part).

Size: length: ♂ 12.0 - 14.0, ♀ 12.0 - 14.0; width: ♂ 5.5 - 6.0, ♀ 5.5 - 6.0. Color: light brown to dark brown. Shape: ovoid, elongate (fig. 14).

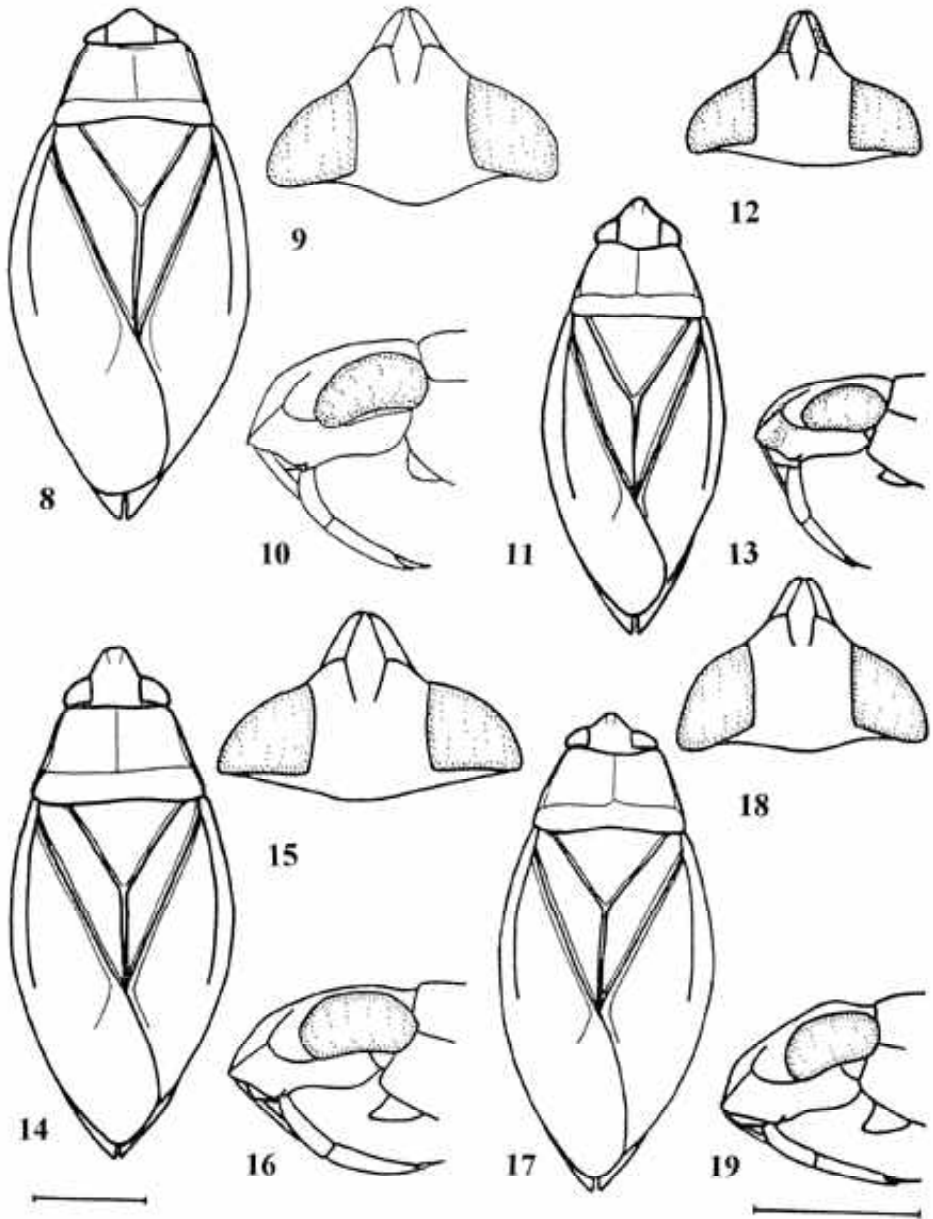
Head: suture anteclypeus-maxillary plate longer than suture anteclypeus-lorum; maxillary plate slightly compressed; anteculus distinctly shorter than interoculus; eyes globose, as wide as long (fig. 15); segment I of the beak shorter than II (fig. 16). Thorax: prosternal keel acutely pointed, prominent (fig. 16). Abdomen: pilosity slightly developed on penultimate segment (fig. 28).

Male genitalia: arms of phallobase divergent, covering lateral margins of ventral diverticulum, one and one half times longer than posterior part of phallobase (figs. 29-31).

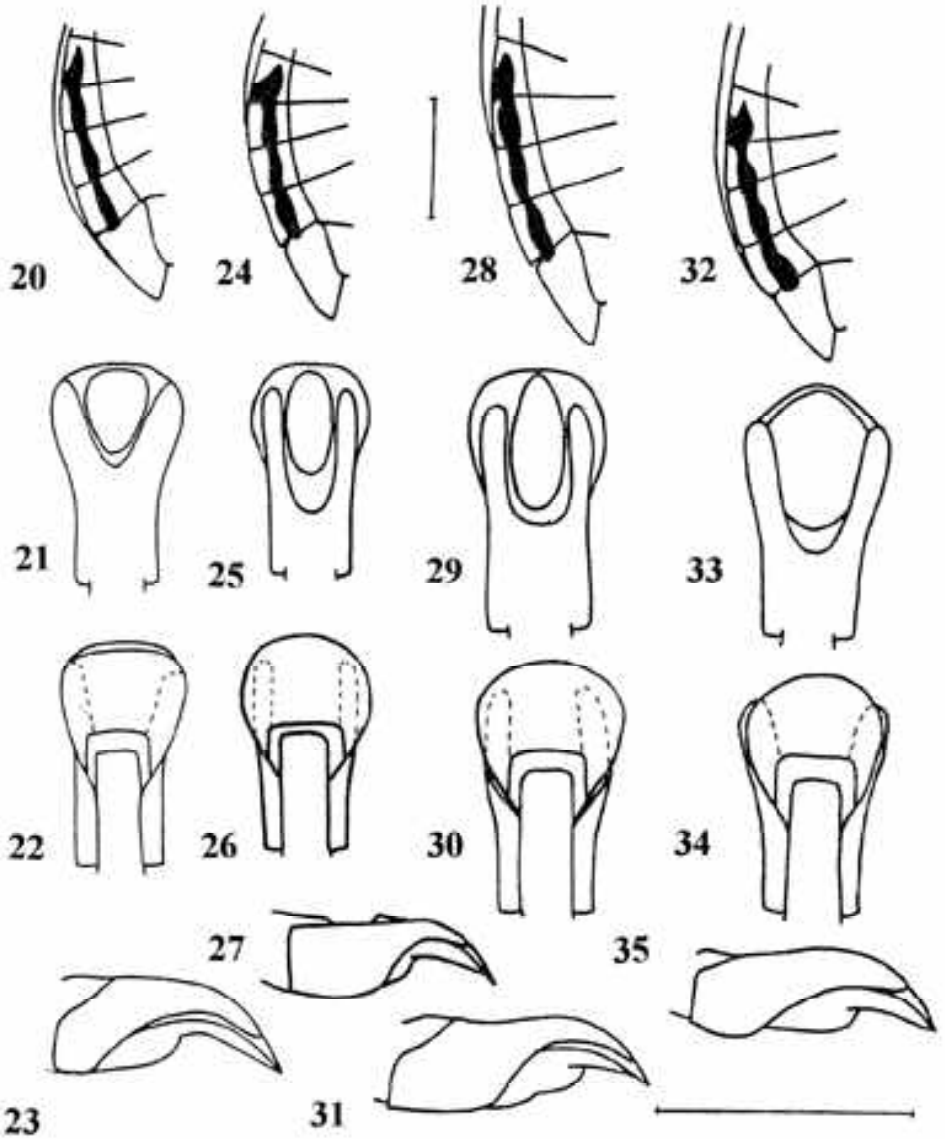
Diagnosis. *Belostoma denticolle* differs from others of the group by the suture anteclypeus-maxillary plate longer than suture anteclypeus-lorum.

Distribution. Northern of South America (Venezuela and Guyana).

Types. We haven't seen the cotype series established by MONTANDON (1903) from "Amer. mer. Surinam", deposited in the Hungarian National Museum.



Figs. 8-19. Body form, head dorsal and lateral views. 8-10, *Belostoma orbiculatum* sp. nov.; 11-13, *B. retusum* sp. nov.; 14-16, *B. denticolle* Montandon; 17-19, *B. amazonum* sp. nov. Scale lines: 3 mm, figs. 8, 11, 14, 17; 2 mm; figs. 9, 10, 12, 13, 15, 16, 18, 19.



Figs. 20-35. Abdominal pilosity and male genitalia dorsal, ventral and lateral views: 20-23, *Belostoma orbiculatum* sp. nov.; 24-27, *B. retusum* sp. nov.; 28-31, *B. denticolle* Montandon; 32-35, *B. amazonum* sp. nov. Scale line: 1 mm, figs. 20-35.

Specimens examined. GUYANA, Supuruni Creek, 2 ♂, ♀, Harris coll. (JTPC); Lamaha E coast, Demerara, ♀, 1932, Harris coll. (JTPC). VENEZUELA, **Monagas**: Maturín, 5 ♂, 5 ♀, 1958, Menke coll. (JTPC); Caracas, 2 ♀, 1950, Roze coll., (JTPC). Without locality references, ♂ (BMNH).

***Belostoma amazonum* sp. nov.**

(Figs. 17-19, 32-35)

Size: length: ♂ 13.0-15.0, ♀ 14.5-16.0; width: ♂ 6.0-6.5, ♀ 6.0-7.0. Color: light brown. Shape: ovoid, elongate (fig. 17).

Head: suture anteclypeus-maxillary plate as long as suture anteclypeus lorum; maxillary plate not compressed; anteculus slightly shorter than interoculus; eyes globose, as wide as long (fig. 18); segment I of the beak shorter than II (fig. 19). Thorax: prosternal keel acutely pointed, prominent (fig. 19). Abdomen: pilosity well developed on penultimate segment (fig. 32).

Male genitalia: arms of phallobase straight, not covering lateral margins of ventral diverticulum (figs. 33-35).

Diagnosis. *Belostoma amazonum* is similar to *B. denticolle* but differs in head and in the arms of phallobase do not cover lateral margins of ventral diverticulum.

Distribution. Apparently restricted to the drainage basin of Amazonas River.

Types. Holotype ♂, allotype ♀, 45 paratypes (20 ♂, 25 ♀) bearing the label: "Manacapuru S.A., Amazonas, Brasil, Solimões River, 6-26, S.M. Kinges" (KU); 3 paratypes (2 ♂, ♀), same locality (JTPC).

Other specimens examined. VENEZUELA, Guar. Calabozo, 3 ♂, 3 ♀, 1969, Spangler coll. (JTPC). BRAZIL, **Amazonas**: ♀ (BMNH); **Bahia**: Santa Rita de Cassia, Rio Preto, 5 ♂, 4 ♀, IV. 1958, Dente coll. (LACM); **Santa Catarina**: Corupa, 2 ♂, IX. 1948, Maller coll. (BMNH). Without locality references, ♂ (BMNH).

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