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## Review of the Predaceous Water Beetles of the Genus *Bidessodes* Régimbart (Coleoptera, Dytiscidae)<sup>1</sup>

by F.N. Young

**Abstract:** The known species of the South and Central American genus *Bidessodes* Régimbart (Coleoptera: Dytiscidae) are diagnosed and five new species described. A key and illustrations of male external genitalia and other characters are provided for use in identification. The following new species are described: *B.* (s. str.) *jucundus* n. sp., Brazil, Bolivia, Panama; *B.* (s. str.) *evanidus* n.sp., Brazil, Venezuela, Suriname; *B.* (s. str.) *charaxinus* n.sp., Brazil, Cayenne; *B.* (s. str.) *acharistus* n. sp., Brazil; *B.* (s. str.) *hygrobius* n. sp., Cayenne. *Hughbosdineus* Spangler (1981) is reassigned to *Bidessodes* as a subgenus including *B. obscuripennis* Zimmermann and *B. knischi* Zimmermann of which *leechi* (Spangler, 1981) is a synonym. *Youngulus* (Spangler, 1981) is reassigned to *Bidessodes* as a subgenus containing *B. franki* (Spangler, 1981).

**Key words:** Coleoptera Dytiscidae – *Bidessodes* – Neotropical – review – general character – coloration.

### Introduction

The South and Central American genus of predaceous water beetles, *Bidessodes* Régimbart (Coleoptera, Dytiscidae), includes at present 13 species which are with few exceptions exceedingly difficult to distinguish except on the basis of male external genitalia. The latter, however, are exceptionally complex both in regard to the aedeagus or sperm packet transfer organ and the parameres. They may be pheromone transfer structures as well as genitalia. The parts must be dissected apart to show the diagnostic features. With the exception of a few species, females are distinguishable only on general habitus and association with males.

### General characters

The genus *Bidessodes* is recognizable by the following combination of characters: head without a transverse cervical stria behind eyes; pronotum with incised plicae on either side of posterior margin, the

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<sup>1</sup> Contribution from the Biological Laboratories of Indiana University, aided by grants from the N. S. F., N. I. H., and the Indiana University Foundation.

plicae fine, sharply incised, oblique or somewhat curved, not connected by a transverse groove; clypeus not greatly thickened; epipleura shallowly excavated at base without transverse carina; prosternal process with apical portion broadened, flat (Fig. 45), feebly concave, or grooved (Fig. 47), setate punctate, without definite margins, the sides usually parallel or converging posteriorly, the apex rounded or feebly acuminate (Fig. 46); metasternal fork broad with lateral margins continuous with those of middle coxal cavities, not bifurcate nor extending onto mid-metasternum, prosternal process usually in contact with fork between middle coxae; no ventral platform indicated; inner lamella of hind coxae with a narrow median longitudinal groove ending at posterior edge of metasternum; coxal lines nearly parallel; coxal processes extending beyond a line drawn between coxal lobes, but closely appressed to and fused with sternite; male external genitalia with parameres complex, jointed, aedeagus usually broad but relatively simple in structure (Figs 2, 28); body form elongate oval, somewhat flattened (Figs 1, 48), pronotum and elytra usually moderately discontinuous because of constriction of pronotal base; elytral color pattern basically lineate with an enlarged preapical blotch (Figs 1, 27, 40), but often all light markings are obliterated by melanization or melanized areas appear as maculations; vestiture composed of many setae in minute to large punctures, especially coarse and dense on the elytra and outer coxal laminae; microsculpture on nearly all body parts giving a metallic sheen in certain lights (optical grid effect) especially on the elytra; length about 2.0 to 3.2+ mm (see also YOUNG, 1967).

Males usually slightly larger and broader than females.

### Other characters used in classification of species

Clypeus: usually slightly thickened and impunctate or only finely and erratically punctate. An impressed row of large setate punctures above each antenna base is sometimes conspicuous but may be overlooked. In *B. (s. str.) semistriatus* Zimm., the rows are deeply impressed and the impressions extend inward to form a nearly complete raised margin to the posterior edge of clypeus.

Front of head: finely and sparsely punctate with punctures separated by from 3 to 6 times their individual diameters. in *B. (Hugbosdineus) knischi* Zimm. and *B. (Hugbosdineus) obscuripennis* Zimm.

the fronts are more finely punctate than in other species with punctures separated by from five to six times the diameter of individual punctures. ZIMMERMANN (1921) uses this character to separate the then known species into two groups, but implies that *B. knischi* Zimm. and *B. obscuripennis* Zimm. have the front impunctate. The vertex of head is nearly or quite impunctate in all species seen.

Pronotum: usually rounded at sides so that greatest width is near middle (Figs 1, 48), but in *B. (s. str.) jucundus* n.sp. the pronotum is nearly parallel sided from about the middle to the base so that the base is almost as wide as the conjoined elytra.

Disk of pronotum: variably punctate, the punctures usually being larger than those on the front of the head. Along the base between the pronotal plicae the punctures are sometimes larger and closer together and coarse strigate sculpture may be present near the plicae.

Elytra: usually more coarsely and irregularly punctate than disk of pronotum. In all species the microsculpture is impressed on the elytra, much as in the genus *Bidessonotus* Régimbart, and gives a distinctly metallic sheen to the surface when light strikes it at certain angles. Microsculpture is evident on most dorsal and ventral surfaces of the body but is most visible on the elytra. Nearly all surfaces, however, show a metallic sheen in certain lights. The microsculpture of the elytra is transverse and longitudinal, the longitudinal grooves being more irregular and interrupted.

Venter: with outer laminae of coxae and abdominal sternites with coarse but shallow punctures. Inner laminae of coxae and metasternum usually less coarsely punctate or sculptured than outer laminae of coxae. Prosternum and prosternal process are often modified. Tip of prosternal process is usually broadened, parallel sided or more or less key-stone shaped with the apex rounded or somewhat acuminate (Figs 44–45). Center of tip may be depressed or show a distinct groove in one or both sexes. Prosternal process anterior to fore coxae is usually simply rounded, but is distinctly carinate or ridged with an elevated flattened area near base in *B. knischi* Zimm. (both sexes) and in *B. obscuripennis* Zimm. (males only). In *B. (s. str.) elongatus* (Sharp) the process anterior to fore coxae is bent but nearly flat, not at all carinate.

Legs: variously modified in males. The basal three segments of the anterior and middle tarsi are usually broader in males than in females and equipped with adhesive setae beneath. In *B. (s. str.) subsignatus*

Zimm. however, the male anterior and middle tarsi are little broader than in females. The middle femur is enlarged (swollen) toward the tip in *B. plicatus* Zimm. and *B. acharistus* n. sp., and the middle tibiae, in these two species and in *B. jucundus* n. sp. and in *B. subsignatus* Zimm. are narrowed and bent near the bases. Metatrochanters are large in all species examined, but are conspicuously enlarged in *B. franki* (Spangler) and *B. obscuripennis* Zimm.

Last visible abdominal sternite: variously modified, carinate or impressed before the apex, and often with very coarse punctures toward apex. Other abdominal sternites may be coarsely punctate, but do not seem to vary much among the species.

Coloration: variable, but nearly all specimens examined have the head, pronotum, and venter largely brownish yellow or yellowish brown. The darkening between the pronotal plicae cited by ZIMMERMANN (1921) is variable, but most species show some darkening of the base of the head and the base of the pronotum. The basic color pattern of the elytra seems to be lineate as shown in figure 1, but in all species examined this pattern is obscured in some individuals by increased melanization. Only teneral individuals are distinctly lineate.

### Key to known species of *Bidessodes* Régimbart<sup>2</sup>

1. Prosternal process anterior to fore coxae distinctly ridged or partly carinate in males, or both males and females, with distinctive setae or spines at the anterior end. Subg. **Hughbosdineus** Spangler ..... 2
- Prosternal process anterior to fore coxae not ridged in either sex, usually simply rounded or feebly carinate ..... 3
2. Prosternal process ridged in front of fore coxae on both sexes; males with distinctive transverse impression of metasternum behind middle coxae; trochanter of hind leg large, but not conspicuously modified; length about 2.3 to 2.6 mm; male external genitalia distinctive (Figs 2–5); Brazil, Venezuela, Panama (= *Hughbosdineus leechi* Spangler).

**B. (H.) knischi** Zimmermann

<sup>2</sup> I have been unable to identify Régimbart's *Bidessodes fragilis*. His types are females and specimens placed with them by Guignot probably represent another species.

- Prosternal process anterior to fore coxae curved (bent) and ridged in male only; metasternum not impressed in either sex; trochanter of hind leg large rounded at outer end and conspicuously extending beyond hind margin of femur (Fig. 44); male external genitalia distinctive (Figs 6–8); size larger, 2.4 to 2.9 mm in length; Brasil.

**B. (H.) obscuripennis** Zimmermann

3. Trochanter of hind leg large, almost square in outline and hind femur enlarged; last visible abdominal sternite transversely impressed before apex, the apex feebly carinate; male genitalia distinctive (Figs 9–11) Brazil... (= *B. vageplagiatus* Zimmermann, inedit.). Subg. **Youngulus** Spangler.

**B. (Y.) franki** (Spangler)

- Trochanters of hind leg large, sometimes slightly modified in males but not conspicuously modified in either sex. Subg.

**Bidessodes** Régimbart ..... 4

4. Prosternum widest at middle, narrowed behind ..... 5

- Prosternum widest at base, nearly as wide as conjoined elytra; tibiae of middle leg narrowed and bent near base in males; male external genitalia distinctive (Figs 12–15); size small, about 2.2 to 2.4 mm in length; Brazil, Bolivia, Panama?.

**B. (s. str.) jucundus** n. sp.

5. Last visible sternite of abdomen of male with an area of coarse strigose sculpture just before tip and sometimes with a small but distinct carina at apex; male external genitalia distinctive (Figs 16–19); size small, 2.2 to 2.4 mm in length; Brazil, Venezuela, Suriname. **B. (s. str.) evanidus** n. sp.

- Last visible abdominal sternite variously impressed, sometimes more roughly sculptured toward apex, but not carinate or only very feebly so ..... 6

6. Last visible abdominal sternite of male deeply impressed on either side; basal segments of anterior and middle tarsi not much expanded, similar to female tarsi; male external genitalia distinctive (Figs 20–22); size small, about 2.0 mm long. Brazil.

**B. (s. str.) subsignatus** Zimmermann

- Last visible abdominal sternite of male not or only feebly impressed at sides (see couplet 10), usually impressed in an oval or round area before apex basal segments of anterior and middle tarsi of male distinctly expanded ..... 7
7. Anterior margin of clypeus thickened with the impressions

above the antennae distinct and extending inward to form a margin on the clypeus; pronotal and elytral punctation coarse, irregular; male external genitalia distinctive (Figs 23–26); size large, 2.5 to 3.2+ mm in length; Brazil, Cayenne.

**B. (s. str.) semistriatus** Régimbart

- Anterior margin of clypeus somewhat thickened, but not margined behind at middle; size smaller, usually less than 3.0 mm in length ..... 8
- 8. Tip of prosternal process (between fore coxae) medially grooved in both sexes ..... 9
- Tip of prosternal process not conspicuously grooved nor impressed, nearly flat ..... 10
- 9. Size smaller, 2.1 to 2.6 mm in length; male external genitalia distinctive (Figs 27–32); elytra with reduced melanic pattern; prosternal process of male in front of fore coxae not bent nor ridged; Brazil, Cayenne.

**B. (s. str.) charaxinus** n. sp.

- Size larger, length 2.6 to 2.9 mm; elytra nearly uniformly light reddish brown; prosternal process of male in front of fore coxae bent, but not carinate or ridged; male external genitalia distinctive (Figs 33–35); Guatemala

**B. (s. str.) elongatus** (Sharp)

- 10. Middle femur of male swollen in outer  $\frac{1}{3}$ ; middle tibia of male narrowed and bent toward base ..... 11
- Middle femur and tibiae not modified in either sex; last visible abdominal sternite feebly impressed at either side and with very coarse punctures before apex, dark pattern of elytra reduced, (Fig. 40) appearing maculate rather than lineate; male external genitalia distinctive (Figs 36–39); length about 2.4 to 2.6 mm; Cayenne.

**B. (s. str.) hygrobis** n. sp.

- 11. In male, middle femora swollen in outer  $\frac{1}{3}$  but margin not extended; dark pattern of elytra extended, male external genitalia distinctive (Figs 41–43); length about 2.5 to 2.8 mm; Brazil.

**B. (s. str.) acharistus** n. sp.

- In male, middle femora swollen in outer  $\frac{1}{3}$  and with lower margin extended as a rounded lobe; male external genitalia distinctive (Figs 49–52); length about 2.4 to 2.8 mm; Brazil.

**B. (s. str.) plicatus** Zimmermann

**Bidessodes (Hughbosdineus) knischi** Zimmermann Figs 1–5, 45.

*Bidessodes knischi* ZIMMERMANN, 1921, Arch. Naturgesch. A 87(3): 198.

Diagnosis: Distinguishable from other species of genus in both sexes by the base of the prosternal process anterior to the fore coxae which is ridged and partly carinate. In males the anterior portion of ridge is flattened, setate, and with elongate setae or small spines resembling small forked fingers at anterior end (noted by ZIMMERMANN, 1921). In males also the metasternum has a transverse groove back of the middle coxae so that the anterior portion is narrowed and depressed to make contact with the tip of the prosternal process. Length about 2.3 to 2.6 mm. Type and paratypes from Corumba, Mato Grosso, Brazil in ZSBS, Munich.

**Bidessodes (Hughbosdineus) obscuripennis** Zimmermann

Figs 6–8, 44, 46, 47.

*Bidessodes obscuripennis* ZIMMERMANN, 1921, Arch. Naturgesch. A 87(3): 198.

Diagnosis: Similar to *B. knischi* in punctuation, but distinguishable in males by the enlarged trochanter of hind leg which extends out at an angle from the femur (Fig. 44). In males also the prosternal process anterior to the fore coxae is curved and partly ridged with setae or spines resembling small fingers at the anterior end. Tip of prosternal process grooved in females. Length averaging greater than in *B. knischi* Zimm., about 2.4 to 3.0+ mm. Type and paratypes from Corumba, Mato Grosso, Brazil in ZSBS, Munich.

**Bidessodes (Youngulus) franki** (Spangler) n. comb. Figs 9–11.

*Youngulus franki* SPANGLER, 1981, Pan-Pac. Ent. 57(1): 67.

Diagnosis: Distinguishable in males by the enlarged hind trochanters and femurs. Base of prosternal process anterior to fore coxae is rounded, not bent or angled. Size large, length about 2.8 to 3.0+ mm. Female not yet known. Type male in National Museum of Natural History (NMNH), Washington, D.C., U.S.A.

**Bidessodes (s. str.) jucundus** n. sp. Figs 12–15.

Diagnosis: Distinguishable in both sexes from other species by the base of the pronotum which is almost as wide as the conjoined bases of the elytra not narrowed as in other species. In males the tibiae of the middle legs are narrowed and bent at the bases. Diagnosis is primary



based, as in other species, upon the male external genitalia (Figs 12–15).

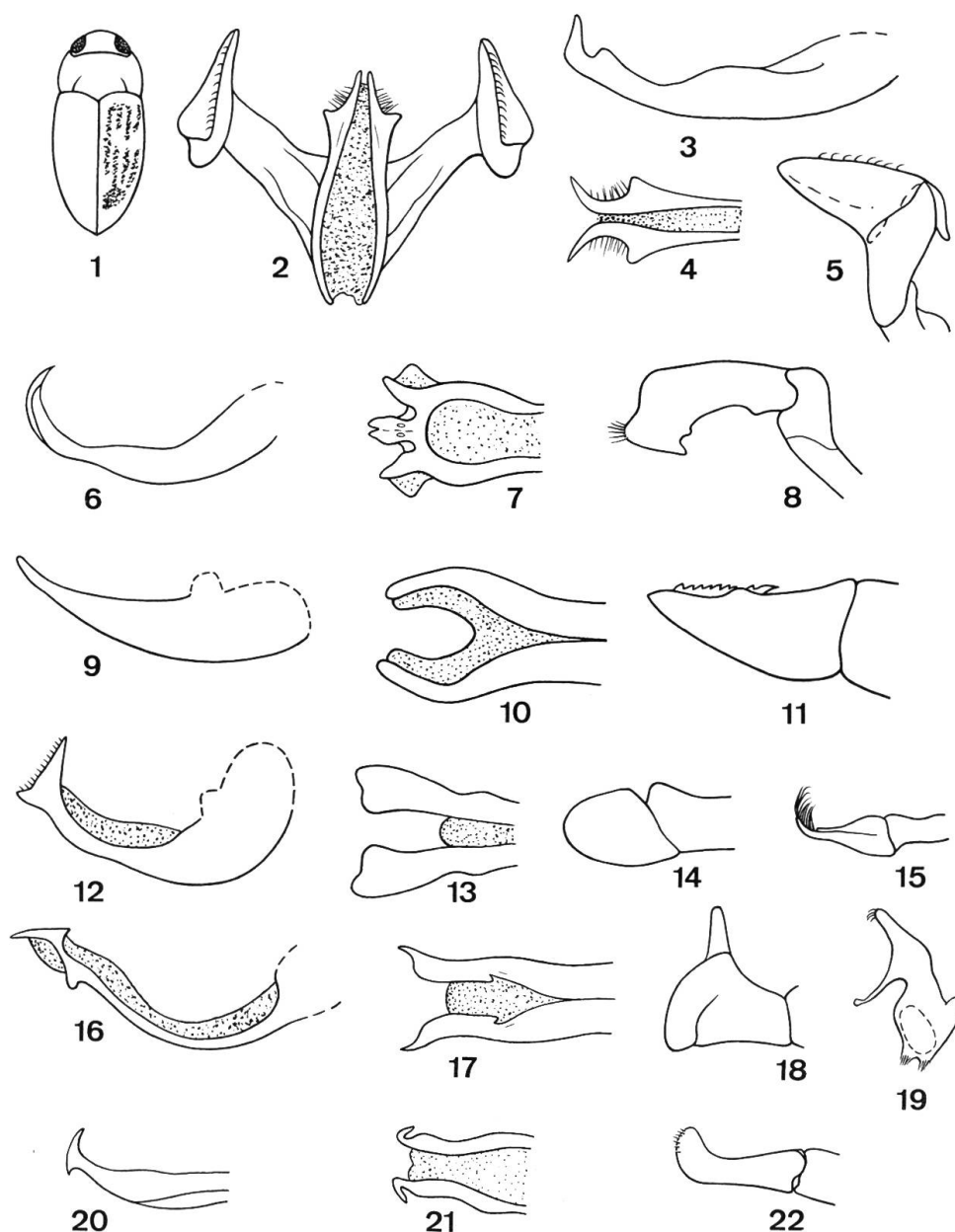
Holotype ♂: Total length 2.2 mm; greatest width near middle of elytra 1.0+ mm. Body form narrowly elongate, not much flattened; clypeus feebly thickened, the setate rows of punctures above antennae inconspicuous; punctation of front much as in *B. knischi* Zimm., fine and not very dense; Pronotal punctation coarser, but about as dense as on head; pronotal plicae distinct, about  $\frac{1}{3}$  as long as pronotum at midline, some strigate sculpture behind each; elytral punctation about as coarse as on pronotum but more irregular, the elytral microsculpture impressed about as in *B. knischi* Zimm.; tip of prosternal process narrowed behind, setate over surface, but not conspicuously impressed or grooved; prosternal process in front of fore coxae nearly straight, rounded; middle tibia narrowed and slightly bent toward base; middle femora similar to those of females; basal segments of fore and middle tarsi somewhat expanded; metatrochanters large but not conspicuously modified, not extending beyond the hind margin of the femur; last visible abdominal sternite irregularly impressed and densely coarsely punctate toward apex; coloration: head, pronotum, and venter nearly uniformly light brownish yellow; pronotum with a narrow, dark transverse band between the plicae at base; elytra brownish yellow but with darker markings on each suggesting a lineate-maculate pattern similar to that of *B. knischi* Zimm.

Allotype ♀: Length 2.2+ mm; greatest width near middle of elytra about 1.0+ mm. Very similar to male except for secondary sexual characters.

Holotype, allotype, and three paratypes from: Brazil, Mato Grosso, Cuiabá, Aug. 24, 1972, BLT, W.H. Whitcomb (in FSCA = Florida State Collection of Arthropods, Gainesville, Florida, U.S.A.). Paratypes from other localities as follows: Brazil, Mato Grosso, Cuiabá, various dates in April 1972, BLT, W. H. Whitcomb (39 in various museums). Brazil, Mato Grosso, Piricicaba, Oct. 10, 1965, BLT, C.A. Triplehorn (2). Brazil, Mato Grosso, Jacaré, Parque Nacional Xingu, Nov. 1965, M.

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Figs 1–22: 1–5. *Bidessodes (Hughbosdineus) knischi* Zimmermann, a paratype from Corumba, Mato Grosso, Brazil: 1, Outline of dorsal aspect of body showing color pattern diagrammatically on right elytron. 2, Aedeagus and parameres viewed from above as in copulatory position. 3, Lateral outline of aedeagus. 4, Tip of aedeagus compressed by glass slide cover. 5, Outer (lateral) aspect of paramere. 6–8. *Bidessodes (Hughbosdineus) obscuripennis* Zimmermann, a paratype from Corumba, Mato Grosso, Brasil: 6, Lateral outline of aedeagus. 7, Tip of aedeagus as viewed from below in copulatory position. 8, Outer (lateral) aspect of paramere. 9–11. *Bidessodes (Youngulus) franki* (Spangler),



paratype of *B. vageplagiatus* Zimmermann (inedit.) from Brazil, Mato Grosso, Corumba: 9, Lateral outline of male aedeagus. 10, Tip of aedeagus as viewed from below in copulatory position. 11, Outer (lateral) aspect of left paramere. 12–15. *Bidessodes* (s. str.) *jucundus* n. sp., holotype from Brazil, Mato Grosso, Cuiaba, W.H. Whitmore (FSCA): 12, Lateral aspect of aedeagus. 13, Tip of aedeagus viewed from below as in copulatory position. 14, Outer (lateral) aspect of left paramere. 15, Same, paramere rotated 90°. 16–19. *Bidessodes* (s. str.) *evanidus* n. sp. holotype male from Suriname, Paramaribo-Zanderij Road at km. 38, clear pond at edge of marsh, B. Malkin (FSCA): 16, Lateral aspect of aedeagus. 17, Tip of aedeagus viewed from below in copulatory position. 18, Outer (lateral) aspect of left paramere. 19, Left paramere viewed end on. 20–22. *Bidessodes* (s. str.) *subsignatus* Zimmermann, holotype male from Brasil, Mato Grosso, Corumba (ZSBS): 20, Lateral aspect of aedeagus. 21, Tip of aedeagus viewed from below in copulatory position. 22, Outer (lateral) aspect of left paramere.

Alvarenga and W.J.A. Bokermann (1). Bolivia, Santa Cruz, Sara 3 km south of Santa Rosa, Feb. 22, 1969, BLT, A. Martinez and R.E. Woodruff (15); 2 km northwest of Santa Rosa, Feb. 21, 1969, BLT, A. Martinez and R.H. Woodruff (4). Brazil, Minas Gerais, Aguas Vermelhas, Dec. 1983, M. Alvarenga, BLT (2).

A female from the Panama, Canal Zone, may also represent this species.

**Bidessodes** (s. str.) **evanidus** n. sp.

Figs 16–19.

Diagnosis: Similar to *B. knischi* Zimm. except for secondary sexual characters of males. A tiny carina can be detected near apex of last visible abdominal sternite in some males and females. If carina is very small or lacking, the last visible sternite is impressed and very rough toward apex. Male external genitalia diagnostic (Figs 16–19). Size small, length 2.2 to 2.4 mm.

Holotype ♂: Length 2.4 mm; greatest width near middle of elytra 1.1 mm. Body form elongate oval, somewhat flattened, dorsal outline constricted between pronotum and elytra; clypeus feebly thickened, rows of setate punctures above antennal bases not conspicuous; punctures on front a little coarser than in *B. knischi* Zimm.; punctures on pronotal disk about as coarse and dense as in *B. knischi* Zimm.; pronotal plicae impressed, strigate sculpture between them reduced; elytra more coarsely and irregularly punctate than pronotal disk, but microsculpture about as in other species; basal segments of anterior and middle tarsi moderately expanded; middle femur and tibia like those of females; tip of prosternal process in male not very broad, narrowed from behind coxae, but apex rounded; prosternal process anterior to fore coxae rounded, not ridged or bent; metatrochanters in both sexes large but not conspicuously modified; last visible abdominal sternite as described in key and diagnosis above; coloration: head, pronotum, and venter mainly brownish yellow, darker yellowish brown along anterior margin and along base of pronotum between plicae; elytra same color as head and pronotum but with melanization covering most of surface but leaving four incomplete light discal stripes, a light preapical area, and lighter lateral margins; pattern essentially like that indicated for *B. knischi* Zimm.

Allotype ♀: Length 2.2+ mm; greatest width near middle of elytra 0.96 mm. Expanded tip of prosternal process grooved. Very similar to males except carina of last visible abdominal sternite not well developed, and basal segments of anterior and middle tarsi not expanded.

Holotype male, allotype female, and 75 paratypes from: Suriname,

Paramaribo-Zanderij Road, clear pond at edge of marsh at km 38, Oct. 14, 1962, Borys Malkin (FSCA). Paratypes: Same data as holotype except, roadside ditch at swamp, Oct. 25, 1962, Borys Malkin (24). Venezuela, Guarico, San Fernando, Feb. 12, 1969, Paul and Phyllis Spangler (2 in National Museum of Natural History, Washington, D.C., U.S.A.). Bolivar, Medio Orinoco, Isla Cuba o Playa Medio, selva humeda, Jan. 28, 1962, at light, Carlos Bordon (34). Brazil, Mato Grosso, Jacaré, Parque Nacional Xingu, Nov. 1965, and Nov. 1966, At light M. Alvarenga and W.J.A. Bokermann (4). Rio de Janeiro, Conceição do Marupa, Nov. 1978, at light M. Alvarenga (2).

**Bidessodes (s. str.) subsignatus** Zimmermann Figs 20–22.

*Bidessodes subsignatus* ZIMMERMANN, 1921, Arch. Naturgesch. A. 87(3): 199.

Diagnosis: Males recognizable by the narrowly expanded anterior and middle tarsi, deeply laterally indented last visible abdominal sternite, and middle tibiae which are slightly bent toward base. The male external genitalia are distinctive (Figs 20–22). This is the smallest of the described species of *Bidessodes* being only about 2.0 mm in length. I have not recognized the female of this species in my material, and have seen only the male type from Corumba, Mato Grosso, Brazil in the ZSBS, Munich.

**Bidessodes (s. str.) semistriatus** Régimbart Figs 23–26.

*Bidessodes semistratus* RÉGIMBART, 1900, ann. Mus. Civ. St. Nat. Genova 40: 529.

Diagnosis: The thickened clypeus, large size, and distinctive male external genitalia (Figs 23–26) should make the recognition of this species relatively easy. The metatrochanters are large, wider than the femur in the middle of their curved hind margin. The color pattern tends to have the dark stripes broken so that some specimens appear to be spotted rather than striped. The pattern, however, seems to be similar to that of *B. knischi* Zimm. and the other species. Type from Mato Grosso, Brazil in MNHN, Paris.

**Bidessodes (s. str.) charaxinus** n. sp. Figs 27–32.

Diagnosis: Distinguishable in the male by the grooved tip of the prosternal precess, and the distinctive external genitalia (Figs 28–32). The color pattern is basically similar to that of *B. knischi* Zimm. but in most specimens seen the melanization is less extended so the longitudinal dark stripes are broken and irregular. However, the pattern seems

to consist of the usual elongate stripes and large preapical dark blotch (Fig. 27). Females may be recognizable by the combination of the color pattern and grooved prosternal tip.

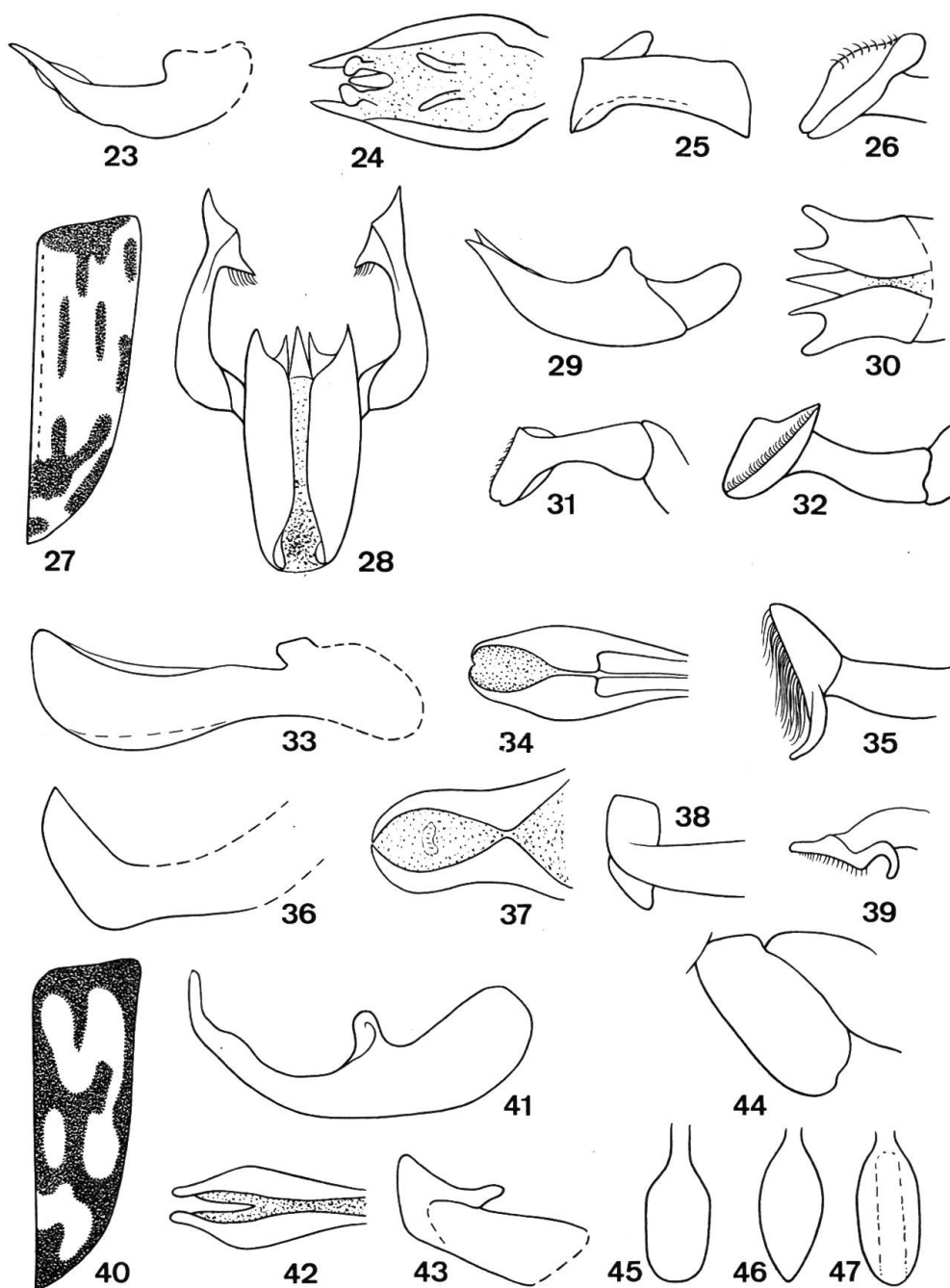
Holotype ♂: Total length 2.5 mm; greatest width near middle of elytra 1.1 mm. Body form elongate oval, somewhat flattened, constricted between pronotum and elytra; clypeus thickened, the rows of setate punctures above antennal bases inconspicuous in shallow impressions; punctures of front slightly coarser than in *B. knischi* Zimm. separated by from three to four times the diameter of each; pronotal punctation coarser than on front but about as dense; pronotal plicae distinct, but strigate sculpture is largely replaced by some irregular punctures; punctation of elytra coarser and more irregular than on pronotal disk; microsculpture on elytra about as in *B. knischi* Zimm.; tip of prosternal process in male large, longer than wide, parallel sided, rounded toward apex, distinctly longitudinally grooved; prosternal process in front of fore coxae, rounded, not bent or ridged; middle tibiae and femur not modified, similar to female; metatrochanters large but not modified, slightly wider than femur at middle of hind margin; last visible abdominal sternite feebly impressed toward tip with very large and irregular punctures.

Allotype ♀: Length 2.5+ mm; greatest width near middle of elytra 1.2 mm. Similar to male; tip of prosternal process similar, grooved. Dark coloration (melanization) reduced in all specimens seen.

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Figs 23–47: 23–26. *Bidessodes* (s. str.) *semistriatus* Régimbart, from Brazil, Mato Grosso, Salobre, Jan. 1955, in Guignot collection (MNHN): 23, Lateral aspect of aedeagus. 24, Tip of aedeagus as viewed from below in copulatory position. 25, Outer (lateral) aspect of right paramere. 26, Inner aspect of right paramere. 27–32. *Bidessodes* (s. str.) *charaxinus* n. sp., paratype male from Cayenne, Lawa River shore opposite Anapaike village: 27, Diagrammatic representation of color pattern of dark markings on right elytron. 28, Genitalia as viewed from above in copulatory position. 29, Lateral aspect of aedeagus. 30, Tip of aedeagus as viewed from below in copulatory position. 31, Outer (lateral) aspect of paramere. 32, Inner aspect of paramere. 33–35. *Bidessodes* (s. str.) *elongatus* (Sharp), cotype from Paso Antonio, Guatemala ex Champion (BMNH): 33, Lateral aspect of aedeagus. 34, Tip of aedeagus viewed from below as in copulatory position. 35, Outer (lateral) aspect of left paramere. 36–40. *Bidessodes* (s. str.) *hygrobius* n. sp., holotype from Cayenne, Lawa River shore opposite Anapaike village, B. Malkin (FSCA): 36, Lateral aspect of aedeagus. 37, Tip of aedeagus viewed from below in copulatory position. 38, Outer (lateral) aspect of left paramere. 39, Left paramere viewed end on. 40, Diagrammatic representation of color pattern on right elytron. 41–43. *Bidessodes* (s. str.) *acharistus* s. sp., holotype male from Brazil, Mato Grosso, Rio Gurupi, 12–15 km east of Caninde, Igarape-Coraci, Borys Malkin. 41, Lateral aspect of aedeagus. 42, Tip of aedeagus viewed from below as in copulatory position. 43, Outer (lateral slightly turned) aspect of paramere. 44, Metatrochanter and base of femur of *B. obscuripennis* Zimmermann. 45–47. Diagrams of tips of prosternal processes: 45, *B. knischi* Zimmermann. 46–47, *B. obscuripennis* Zimmermann, male left and female grooved.

Holotype, allotype, and 617 paratypes from: Brazil, Para, Rio Gurupi 12–15 km east of Caninde, Igarape Coraci, mud, fine sand bottom, much foliage in water, Dec. 19, 1965, Borys Malkin (FSCA). Other paratypes from: Brazil, Para, Rio Gurupi near Aldeia Coraci, 13 km west of Caninde, Dec. 2, 1967, Borys Malkin (20). Stream near Aldeia Coraci, 11 km west of Caninde, Dec. 2, 1967, Borys Malkin (4). Caninde, Rio



Gurupi, Maranhee, in small, filthy leaf-filled pool, Dec. 7, 1964, Borys Malkin (1). Stream near Aldeia Coraci, Dec. 2, 1964, Borys Malkin (4). Brazil, Bahia, Encruzilhada, 960 m, Nov. 7, 1972, M. Alvarenga (2). Cayenne, Lawa River shore opposite Anapaike, Nov. 22–25, 1963, Borys Malkin (3). Same except Nov. 25, 1963, Borys Malkin (121).

**Bidessodes (s. str.) elongatus** (Sharp)

Figs 33–35.

*Bidessus elongatus* SHARP, 1882, Biol. centr.-am. 1(2): 25.

Diagnosis: The grooved tip of the prosternum, larger size, and distinctive male external genitalia (Figs 33–35) distinguish this Central American species. The elytral punctation is coarser and more irregular than in *B. knischi* Zimm.. The base of the prosternal process in front of fore coxae is somewhat bent, but not at all carinate or ridged. Last visible abdominal sternite deeply, irregularly impressed before apex, but not conspicuously rough. I have seen only the type and paratypes from Guatemala in the British Museum (Natural History), London.

**Bidessodes (s. str.) hygrobius** n. sp.

Figs 36–40.

Diagnosis: The maculate color pattern of the elytra and the distinctive male external genitalia (Figs 36–39) should distinguish this species. It lacks distinctive male secondary characters except for the expanded basal segments of the fore and middle tarsi.

Holotype ♂: Total length 2.4 mm; greatest width near middle of elytra 1.0+ mm. Clypeus thickened, the rows of setate punctures above the antennal bases not conspicuous but impressed and forming a partial margin separating clypeus and front; front punctate about as finely and densely as in *B. knischi* Zimm.; pronotum more coarsely punctate than front, but about as densely; pronotal plicae impressed, curved in, but strigate sculpture greatly reduced; elytral punctures about as coarse but more irregular than those of the pronotum; microsculpture about as in *B. knischi* Zimm., conspicuous only on elytra but present over most of dorsum and venter; tip of prosternal process not very broad, the tip rounded, disk feebly impressed, roughened; base of prosternal process in front of fore coxae not bent, carinate, nor ridged; middle femora and tibiae not modified, about as in females; metatrochanters large, a little wider at widest point than femur at middle; femur not widened; last visible abdominal sternite with tiny impression before tip and with very coarse punctures; color pattern of elytra reduced so that the darker pigment appears more or less in spots (Fig. 40) without much indication



of the lineate pattern found in various other species.

Allotype ♀: Length 2.4 mm; greatest width near middle of elytra 1.0+ mm. Very similar to male except for narrow anterior and middle tarsi. Last visible abdominal sternite not impressed but with a few coarse punctures toward apex.

Holotype, allotype, and five paratypes from: Cayenne, Lawa River shore opposite Anapaike village, Nov. 25, 1963, Borys Malkin (FSCA).

**Bidessodes** (s. str.) **acharistus** n. sp.

Figs 41–43.

Diagnosis: Male with middle femora swollen in outer  $\frac{1}{3}$  but lower margin not extended as a lobe; middle tibiae of male narrowed and bent at their bases. Male external genitalia (Figs 41–43) distinctive.

Holotype ♂: Total length 2.8 mm; greatest width near middle of elytra 1.2+ mm. Body form elongate oval, somewhat flattened; clypeus somewhat thickened, the rows of setate punctures above antennal bases conspicuous, but impression not extended across front; front more coarsely punctate than in *B. knischi* Zimm. the punctures separated by three to five times the diameter of each; pronotal punctures distinctly coarser and denser than on front; coarser than in *B. knischi* Zimm.; pronotal plicae only about  $\frac{1}{3}$  length of pronotum at midline, interrupted by strigate sculpture in part; elytra distinctly more closely and irregularly punctate than pronotum or elytra of *B. knischi* Zimm.; microsculpture of elytra much as in *B. knischi* Zimm.; tip of prosternal process broad, not very acuminate at apex, not distinctly impressed or grooved; prosternal process anterior to fore coxae not carinate, ridged, nor bent; basal segments of anterior and middle tarsi moderately expanded; middle femora swollen toward tip but margin not extended as in *B. plicatus* Zimm.; middle tibiae narrowed and bent toward their bases; metatrochanter large, but not subrectangular, the femur somewhat broadened but not as distinctly as in *B. franki* (Spangler); no lighter pattern evident on the dark reddish brown elytra, but patterned in some specimens; last visible abdominal sternite barely perceptibly impressed on either side not conspicuously coarsely sculptured toward apex.

Allotype ♀: Length 2.9 mm; greatest width near middle of elytra 1.2+ mm. Similar to male in size, color, and punctation, but lacking the expanded fore and middle tarsi, the modified middle femora and tibiae, and the enlarged metafemur.

Holotype male and five paratypes from: Brazil, Para, Rio Gurupi, 12–15 km west of Caninde, Igarape Coraci, Dec. 19, 1965, Borys



Malkin (FSCA).

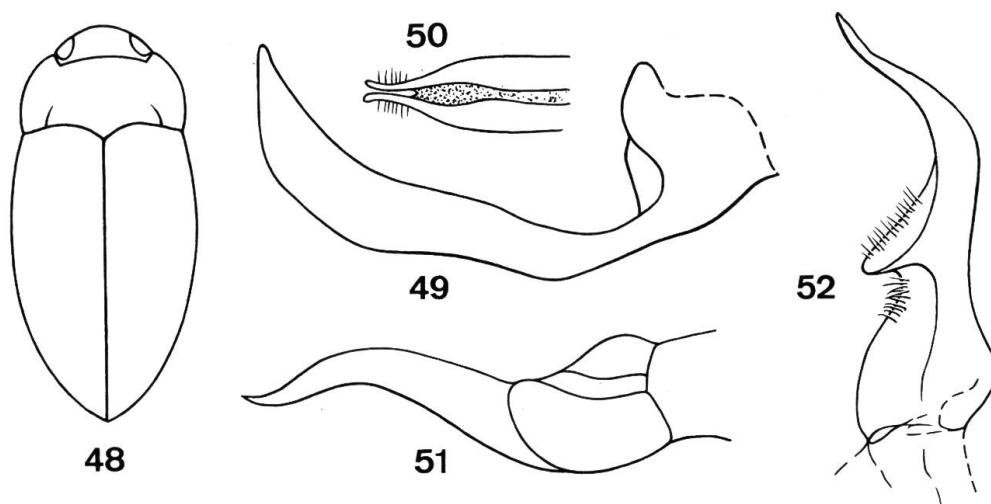
Allotype female and five paratypes from: Brazil, Para, Rio Gurupi, shallow inlet of Igarape Coraci, 13 km west of Caninde, Dec. 2, 1964, Borys Malkin (FSCA).

**Bidessodes (s. str.) plicatus** Zimmermann

Figs 48–52.

*Bidessodes plicatus* ZIMMERMANN, 1921, Arch, Naturgesch. A 87(3): 198.

**Diagnosis:** The modified middle femora and tibiae help to distinguish the male of this species. Middle femora have the lower angles extended as rounded lobes, and the middle tibiae are narrowed and bent near their bases. Male external genitalia are distinctive (Figs 49–52). Elytral punctation somewhat coarser than in *B. knischi* Zimm.. Fore and middle legs with basal tarsal segments expanded. Metatrochanters large but not conspicuously modified, the femur broader at middle than in females. Last visible abdominal sternite broadly impressed before apex, but not conspicuously more coarsely sculptured; female with smaller elongate oval impression and coarser punctures. Color pattern extended in many specimens, but some with indications of three basal-discal dark stripes and dark preapical blotch with suture and outer margins lighter. The species seems to occur widely in the Mato Grosso. Type and paratypes from Corumba, Mato Grosso, Brazil in ZSBS, Munich.



Figs 48–52: *Bidessodes* (s. str.) *plicatus* Zimmermann, a specimen from Jacaré, Parque Nacional Xingu, Mato Grosso, Brazil, compared with types in Munich: 48, Dorsal outline of body. 49, Lateral outline of aedeagus. 50, Tip of aedeagus as viewed from below in copulatory position. 51, Outer (lateral) aspect of right paramere. 52, Inner aspect of left paramere.

**Bidessodes (s. str.) fragilis** Régimbart

*Bidessodes fragilis* RÉGIMBART, 1900, Ann. Mus. Civ. St. Nat. Genova 40: 530.

I have been unable to recognize this species, but according to the original description and Régimbart's paratypes (Muséum National d'Histoire Naturelle, Paris, France) it should be: Similar to *B. semistriatus* Rég. with clypeus moderately thickened (but not margined); front somewhat more coarsely punctate than in *B. knischi* Zimm., but not much more densely; pronotum with coarser punctures about as dense as on head; pronotal plicae about  $\frac{1}{3}$  length pronotum at midline with some coarse punctures behind and near them; microsculpture about as in *B. knischi* Zimm.; tip of prosternal process in male flat, not strongly acuminate; base of prosternal process in front of fore coxae not bent, carinate, nor ridged; fore and middle tarsi with basal segments moderately expanded; last visible abdominal sternite not impressed but with coarse setate punctures toward apex. Length about 2.3 to 2.8 mm. Described from Paraguay, Rio Monday Genn. Marzo, 1899, G. Boggiani (type in Museum Civico Storia Naturelle, Genoa, Italy). *Bidessodes acharistus* n. sp., described above, may prove to be *B. fragilis* Rég.. Type female from Rio Monday, Haut Paraguay in MNHN, Paris.

**Ecology**

Most specimens of *Bidessodes* in collections have been taken at light, and in consequence we know little about their ecology or habitat preferences. Dr. Borys Malkin, however, collected several species in shallow inlets and along river shores in Brazil and Cayenne as well as in "small, filthy, leaf-filled pools in forest" in Brazil, and in a clear pond and roadside ditch in Suriname. Where found, specimens are usually fairly abundant, and several species may be included in the same collection. I suspect that most species are found in almost any aquatic habitat available in the hylean forest.

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I have examined the types of all described species in the various museums as cited after each species. Types of all new species are deposited in the Florida State Collection of Arthropods (FSCA), Gainesville, Florida, U.S.A.

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