

Spanglerodessus shorti and *Incomptodessus camachoi*, new genera and species of Bidessini from Guyana and Venezuela (Coleoptera: Dytiscidae: Hydroporinae)

KELLY B. MILLER¹ & MAURICIO GARCIA²

¹Department of Biology and Museum of Southwestern Biology, University of New Mexico, Albuquerque, New Mexico 87131 USA.
E-mail: kbmillers@unm.edu

²Centro de Investigaciones Biológicas, Facultad de Humanidades, La Universidad del Zulia, Zulia, Venezuela.
E-mail: meruidae_garcia@yahoo.es

Abstract

Two new genera and species are described. *Spanglerodessus* **n. gen.** is described to include the single new species, *S. shorti* **n. sp.** from localities in eastern Venezuela and western Guyana. This genus is similar to *Bidessodes* Régimbart and *Fontidessus* Miller and Spangler, but differs from the first in having overall dark coloration, lack of dorsal color patterns or iridescence, a broad lateral bead, and broad and robust habitus. From *Fontidessus* the genus differs in being much more robust and lacking natatory setae. *Incomptodessus* **n. gen.** is described to include a single new species *I. camachoi* **n. sp.** from localities in the upper Orinoco River basin in Amazonas and Bolívar States. This genus differs from similar bidessine genera, *Sharphydrus* Omer-Cooper, *Tyndallhydrus* Sharp, *Liodessus* Guignot and *Neobidessus* Young, in having impunctate metacoxae and metaventricle and lacking basal striae on the elytra.

Key words: diving beetles, Neotropical, hygropetric

Resumen

Dos nuevos géneros y especies se describen. *Spanglerodessus* **n. gen.** se describe a fin de incluir la especie nueva, *S. shorti* **n. sp.** de localidades en el este de Venezuela y Guyana occidental. Este género es similar a *Bidessodes* Régimbart y *Fontidessus* Miller y Spangler, pero se diferencia de los primeros en tener la coloración oscura en general, la falta de patrones de coloración dorsal o iridescencia, una tira lateral amplia, y el habitus amplio y robusto. Desde *Fontidessus* del género difiere en ser mucho más robusto y carente de setas natatorias. *Incomptodessus* **n. gen.** se describe a incluir una nueva especie única *I. camachoi* **n. sp.** de las localidades en la cuenca alta del río Orinoco en Amazonas y Bolívar Estados. Este género se diferencia de géneros bidessine similares, *Sharphydrus* Omer-Cooper, *Tyndallhydrus* Sharp, *Liodessus* Guignot y *Neobidessus* Young por tener metacoxas impunctate y metasterno y carente de estrías basal de los élitros.

Introduction

The Guyana Shield region of northern South America continues to produce discoveries of new Hydradeptera including not only new species, but also new supraspecific taxa (Spangler and Steiner, 2005; Miller and Spangler, 2008; Miller, 2009). Recently, a new genus of Bidessini, *Fontidessus* Miller and Spangler, was described to include three new species from Venezuela (Miller and Spangler, 2008). As noted in that paper, Bidessini represents a complex of genera with relatively few characters that come in a variety of combinations. New species in this tribe with novel combinations of these characters continue to be discovered. The two new genera and species described here are examples of this.

Material and methods

Measurements. Measurements were taken with an ocular scale on a Wild M3C dissecting microscope. Large and small specimens were measured to assess the range of sizes. Measurements include: 1) total length (TL), 2) greatest width across elytra (GW), 3) greatest width of pronotum (PW), 4) greatest width of head (HW), and 5) distance between eyes (EW). The ratios TL/GW and HW/EW were also calculated.

Material. Specimens were examined from the United States National Museum of Natural History, Smithsonian Institution (USNM, W.E. Steiner), the Natural History Museum and Biodiversity Research Center, University of Kansas (SEMC, A.E.Z. Short), the Universidad Central de Venezuela, Maracay, Venezuela (MIZA, L. Joly), and the Museum of Southwestern Biology, University of New Mexico (MSBA, K.B. Miller). The holotypes are deposited in MIZA with paratypes distributed between MIZA, USNM, SEMC and MSBA. Specimens of nearly all other genera in Bidessini were also examined over the course of several years.

Spanglerodessus Miller and Garcia, new genus

(Figs. 1–6,10,11)

Type species. *Spanglerodessus shorti* Miller and Garcia, new species, by present designation.

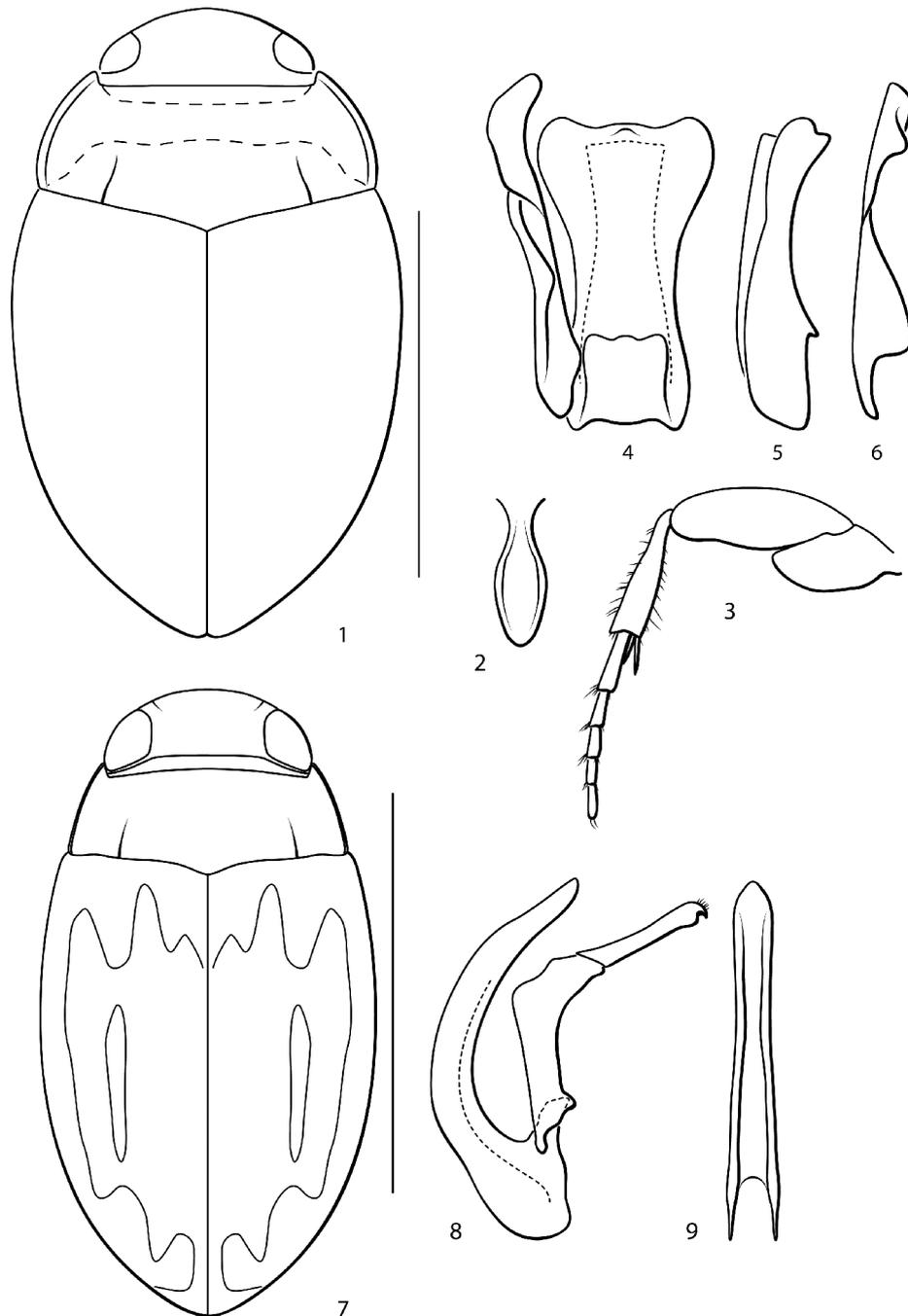
Diagnosis and description. This genus differs from others in the tribe by the combination of: 1) transverse occipital line absent (Fig. 1), 2) basal pronotal striae present (Fig. 1), 3) basal elytral stria absent (Fig. 1), 4) elytral sutural stria faintly present in some specimens, 5) anterior clypeal margin unmodified, 6) elytron without longitudinal carinae (Fig. 1), 7) epipleuron without transverse carina at humeral angle, 8) lateral lobes of aedeagus two-segmented (Figs 4, 6), 9) habitus robust, short, lateral margins of pronotum and elytron conspicuously rounded (Fig. 1), and 10) lateral bead on pronotum broad (Fig. 1). Individuals lack natatory setae on the legs, which are robust and spinous, in general (Fig. 3).

Etymology. The genus name is formed from a combination of “*spangler*” in honor of the great water beetle worker and friend, Paul J. Spangler, and “*dessus*,” a common root in other genus names in this tribe.

Distribution and habitat. *Spanglerodessus* is known from the following newly described species from the Kumu Falls in Guyana and nearby localities in Venezuela (Fig. 11). Label data indicated that specimens were collected in pools at the base of Kumu Falls.

Discussion. In addition to the species described here, four specimens of what appears to be another new species in this genus are in the USNM. These specimens are represented by only females and, so, are not described here. The specimens were found at the same site as *Spanglerodessus shorti*. Whereas that species was found in “side pools at base of falls,” label data indicate the specimens of the other species were collected from “wet boulders,” possibly a distinctly different microhabitat.

This genus keys to *Bidessodes* Régimbart in Biström’s (1988) key to the Bidessini genera of the world. *Spanglerodessus* specimens are considerably more robust than members of *Bidessodes*, which are elongate. Additionally, *Bidessodes* species are pale in coloration, typically with longitudinal yellow fasciae and conspicuous iridescence on the elytra, and have the lateral bead on the pronotum very narrow. Despite these numerous differences, it seems likely that *Bidessodes* may be closely related to *Spanglerodessus*. *Spanglerodessus* may also be closely related to the recently described *Fontidessus* Miller and Spangler, but *Spanglerodessus* are considerably more robust and lack natatory setae on the legs. Nevertheless, given the habitat and morphology of *Spanglerodessus*, which are quite similar to *Fontidessus*, it appears *Spanglerodessus* may be closely related to that genus. It is always a difficult challenge to decide whether to create a new genus or expand the definition of an existing genus in such circumstances. This problem is particularly acute in Bidessini where the many genera are defined by a few characters which occur in combinations clearly implying considerable homoplasy. Miller and Spangler (2008) and Balke and Ribera (2004) (among others) pointed out some of the serious problems with the distribution of the few characters (particularly the transverse occipital line) and their degree of homoplasy in the tribe. Nothing short of a comprehensive phylogenetic analysis of Bidessini with broad taxon sampling and extensive molecular data will likely help clarify how general these features are distributed and in what combination. In this case, we believe that, for now, a new genus is warranted in the absence of a comprehensive cladistic analysis of the tribe to help determine character distributions in a phylogenetic context.



FIGURES 1–9. Figs 1–6. *Spanglerodessus shorti*. 1, dorsal habitus, bar = 1.0mm. 2, prosternal process. 3, right metathoracic leg, ventral aspect. 4–6, male genitalia, 4, median lobe and right lateral lobe, dorsal aspect, 5, median lobe, left lateral aspect, 6, left lateral lobe, left lateral aspect. Figs 7–9. *Incomptodessus camachoii*. 7, dorsal habitus, bar = 1.0mm. 8, male median lobe and right lateral lobe, right lateral aspect. 9, male median lobe, ventral aspect.

***Spanglerodessus shorti* Miller and Garcia, new species**

(Figs 1–6,10,11)

Type locality. Venezuela, Bolivar State, rocky stream along La Escalera, 6°1'38.0"N 61°23'41.1"W, 690m.

Diagnosis. *Spanglerodessus shorti* is the only member of this genus and is characterized by the diagnostic features of *Spanglerodessus*. Likely species level diagnostic features include the overall dark brown dorsal coloration

with transverse medial yellow-brown region on pronotum (Fig. 1) and the shape of the male genitalia (Figs 4–6). The median lobe is very broad and apically trilobate (Fig. 4).

Description. *Measurements.* TL = 1.5–1.7 mm, GW = 0.9–1.0 mm, PW = 0.8–0.9 mm, HW = 0.5–0.6 mm, EW = 0.3–0.4 mm, TL/GW = 1.5–1.6. Body broad, robust, globular (Fig. 1); lateral outline discontinuous between pronotum and elytron; lateral margins of pronotum broadly and evenly curved; lateral margins of elytron broadly curved.

Coloration. Head dark brown, pronotum dark brown along posterior half and anterior margin, medial and lateral region yellow-brown; elytron dark brown. Ventral surfaces and appendages red-brown to yellow-brown.

Sculpture and structure. Head with very fine, inconspicuous, irregular punctation, surface between punctures with microsculpture in the form of small, isodiametric cells; eyes medium in size (Fig. 1, HW/EW = 1.54–1.61). Pronotal surface similar to that of head; with posterior angles obtuse; lateral bead broad, of even width throughout (Fig. 1); pronotal striae prominent, extending about 1/3 distance across pronotum (Fig. 1). Elytron with anterolateral angle obtuse, not strongly extended anteriorly; surface similar to pronotum. Prosternal process broad, lateral margins subparallel, apex of process broadly rounded, extending to metasternal fork (Fig. 2); metacoxal process with lateral lobe minute but distinct; metaventricle finely, sparsely punctate, metacoxa impunctate, both metaventricle and metacoxae with distinct microsculpture. Pro- and mesotarsi moderately broad in male, slightly narrower in female. Metatrochanter large relative to metafemur (Fig. 3).

Male genitalia. Median lobe in ventral aspect broad, expanded apically with apical margin weakly trilobate (Fig. 4); in lateral aspect slender, straight to ventrally-curved apex (Fig. 5). Lateral lobe in lateral and ventral aspects narrow, broadly curved throughout length, apically narrowly rounded (Fig. 6).

Etymology. This species is named in honor of our good friend and colleague A.E.Z. Short (University of Kansas).

Distribution and habitat. Label data indicate the Guyana specimens were collected in pools in the stream bed at the base of a large waterfall. Other specimens were collected along a rocky stream, and the species is hygropetric (Figs 12–14).

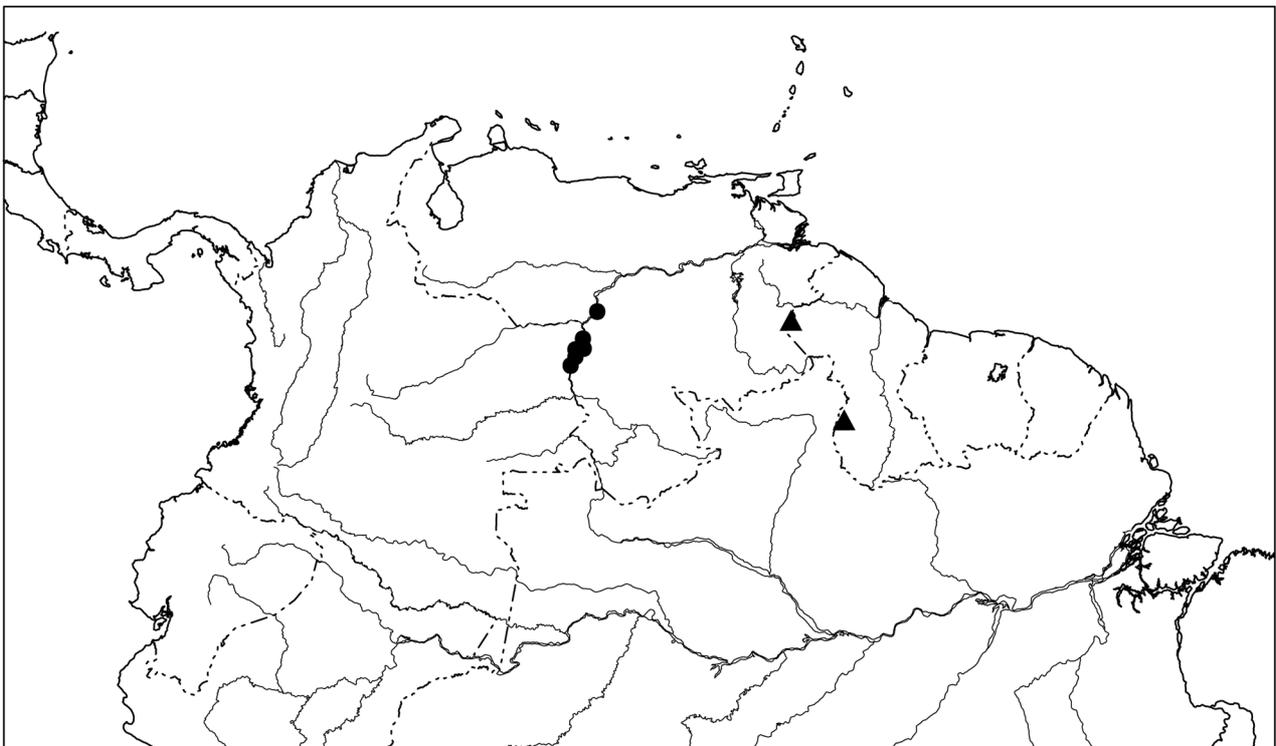


FIGURE 10. Known distribution of *Spanglerodessus shorti* (triangles) and *Incomptodessus camachoii* (circles).

Material examined. HOLOTYPE: ♂ in MIZA labeled, “VENEZUELA: Bolivar State 6°1'38.0"N 61°23'41.1"W, 690 m Along La Escalera; 31.vii.2008 leg. A.Short, M.Garcia, L.Joly AS-08-059; rocky stream/

[barcode] SM0828289 KUNHM-ENT/ HOLOTYPE: *Spanglerodessus shorti* Miller and Garcia, 2011 [red label with black line border].” 37 Paratypes (SEMC specimen numbers SM0828281-SM0828284, SM0828286-SM0828287, SM0828290, SM0828292, SM0827367-SM0827386, SM0827388-SM082739); 9 labeled same as holotype; 24 labeled same as holotype except “...6°2'10.5"N 61°23'57.8"W, 630m AS-08-058”; 4 labeled, “GUY-ANA Lethem (25kmSE), KumuFalls 3°15.9'N 59°43.6'W 4Apr1994,PJSpangler/ Collection #14 side pool at base of falls.” Each paratype with label reading, “PARATYPE: *Spanglerodessus shorti* Miller and Garcia, 2011 [blue label with black line border].”

Incomptodessus Miller and Garcia, new genus

(Figs. 7–10,12–14)

Type species. *Incomptodessus camachoi* Miller and Garcia, new species, by present designation.

Diagnosis and description. This genus differs from others in the tribe by the combination of: 1) transverse occipital line present (Fig. 7), 2) basal pronotal striae present (Fig. 7), 3) basal elytral stria absent (Fig. 7), 4) elytral sutural stria absent (Fig. 7), 5) anterior clypeal margin unmodified, 6) elytron without longitudinal carinae (Fig. 7), 7) epipleuron without transverse carina at humeral angle, 8) lateral lobes of aedeagus two-segmented (Fig. 8), 9) habitus elongate oval, lateral margin slightly discontinuous between pronotum and elytron (Fig. 7), 10) lateral bead on pronotum narrow (Fig. 7), and 11) metaventricle and metacoxae impunctate.

Etymology. The genus name is formed from a combination of Latin *incomptus*, meaning “unadorned” because of the simple morphology of members of this genus, and “*dessus*,” a common root in other genus names in this tribe.

Distribution and habitat. The single species in the genus is known only from a few localities in the upper Orinoco basin of Venezuela near the town of Puerto Ayacucho where it is hygropetric (Figs 12–14).

Discussion. This genus keys to the South African genus *Sharphydrus* Omer-Cooper in Biström’s (1988) key to the Bidessini genera of the world. Both *Incomptodessus* and *Sharphydrus* have a transverse occipital line on the posterior surface of the head and basal pronotal striae and each lack sutural striae on the elytra, an epipleural carina, keels on the elytra, a border or other modification to the anterior margin of the clypeus, and basal striae on the elytra, among other things. *Incomptodessus* differs from *Sharphydrus* in the entirely impunctate metacoxae and metaventricle (*Sharphydrus* has a line of punctures on each side of the metaventricle). *Incomptodessus* is similar also to *Tyndallhydrus* Sharp, but differs from that genus in having impunctate metacoxae and metaventricle and the prosternal process reaching the mesoventricle. *Incomptodessus* is similar to both *Liodessus* Guignot and *Neobidessus* Young, but differs from both in lacking basal striae on the elytra and from the latter in the lack of an accessory basal stria on the elytra. Two species of *Liodessus*, *L. hobbsi*, and *L. flavicollis*, have reduced basal elytral striae, but the striae, though short, are still present and these species are densely punctate on the dorsal and ventral surfaces and have a rather different body form and other structures from *Incomptodessus*. Finally, *Incomptodessus* is similar to *Fontidessus* Miller and Spangler in many respects, but differs from that genus in the presence of a cervical line (though see Balke and Ribera (2004) for a discussion of this problematic character).

Incomptodessus camachoi Miller and Garcia, new species

(Figs 7–10,12–14)

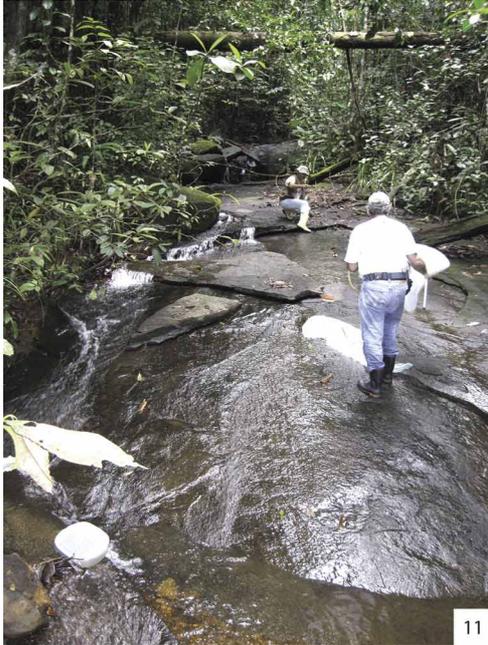
Type locality. Venezuela, Estado Amazonas, river near Orinoco/Sipapo confluence, rock pools, 5°03.707'N, 67°46.768'W.

Diagnosis. *Incomptodessus camachoi* is the only member of this genus and is characterized by the diagnostic features of *Incomptodessus*. Likely species level diagnostic features include the light yellow-brown head and pronotum, the elytra anteriorly, laterally and apically light yellow-brown with a large, diffuse medial brown region or with diffuse longitudinal fasciae (Fig. 7), and the shape of the male genitalia (Figs 8, 9). The median lobe is slender in lateral aspect, with the apex slightly curved ventrad (Fig. 8).

Description. *Measurements.* TL = 1.3–1.5 mm, GW = 0.7–0.8 mm, PW = 0.6–0.7 mm, HW = 0.4–0.5 mm, EW = 0.2–0.3 mm, TL/GW = 1.8–1.9. Body slender, elongate (Fig. 7); lateral outline slightly discontinuous

between pronotum and elytron; lateral margins of pronotum slightly curved; lateral margins of elytron broadly and evenly curved.

Coloration. Head light yellow-brown, pronotum light yellow brown, darker along anterior and posterior margins; elytron yellow-brown along anterior and lateral margins and apically, with broad, diffuse medial brown region, generally presenting as poorly-defined longitudinal fasciae (Fig. 7). Ventral surfaces and appendages yellow-brown.



11



12



13



14

FIGURES 11–14. Habitats. 11, *Spanglerodessus shorti*, AS-08-058. 12–14, *Incomptodessus comachoi*; 12, VZ09-0114-01C; 13, VZ09-0112-01B; 14, VZ09-0115-01D. Codes correspond to collection locality codes listed in “Material examined” section for each species.

Sculpture and structure. Head with very fine, inconspicuous punctation, surface between punctures with fine, irregular microsculpture; eyes medium in size (Fig. 7, HW/EW = 1.7–1.8). Pronotal surface similar to that of head, without microsculpture; posterior angles distinctly angulate; lateral bead narrow, of even width throughout (Fig. 7); pronotal striae prominent, extending 1/3 to nearly 1/2 distance across pronotum (Fig. 7). Elytron with anterolateral angle obtuse, not extended anteriorly; surface finely, sparsely punctate. Prosternal process slender, lateral margins

convergent posteriorly, apex of process pointed, extending to metasternal fork; metacoxal process with lateral lobe minute but distinct; metacoxae and metaventrite impunctate. Pro- and mesotarsi moderately broad in male, slightly narrower in female. Metatrochanter moderately large relative to metafemur.

Male genitalia. Median lobe in ventral aspect slender, lateral margins subparallel, slightly constricted medially, apex broadly pointed (Fig. 9); in lateral aspect slender, evenly curved, apex slightly curved ventrad (Fig. 8). Lateral lobe in lateral aspect narrow, basal segment curved, broad medially, apical segment elongate, slender (Fig. 8).

Etymology. This species is named in honor of our good friend and colleague J. Camacho (Universidad del Zulia).

Distribution and habitat. This species is characteristic of shallow rock pools, seeps and stream margins associated with inselbergs (large granite outcrops) in the upper Orinoco region near Puerto Ayacucho (Figs 12–14). These granite outcroppings have an unusual number of endemic species of plants (Rocchi, 1984; Gröger and Huber, 2007), and several new Hydradephaga taxa have been described from these habitats (Spangler and Steiner, 2005; Miller and Spangler, 2008; Miller, 2009).

Material examined. HOLOTYPE: ♂ in MIZA labeled, “VENEZUELA: Amazonas State 5°03.707'N, 67°46.768'W, 92m River nr. Orinoco/Sipapo confl. 15.i.2009; leg. M. Garcia VZ09-0115-01D: rock pool/HOLOTYPE *Incomptodessus comachoi* Miller and Garcia, 2010 [red label with black line border]”. Paratypes, 216 total, all labels with “VENEZUELA: Amazonas State...” unless otherwise given; 35 labeled same as holotype; 14 labeled “...5°30.623'N, 67°36.109'W; 100m ca. 15 km S. Puerto Ayacucho rock pools on top; 14.ix.2007 AS-07-011b; leg. A.E.Z. Short”; 7 labeled “...5°30.623'N, 67°36.109'W; 100m ca. 15 km S. Puerto Ayacucho pool at outcrop base; 14.ix.2007 AS-07-011x leg. A.E.Z. Short; 1 labeled “...5°30.518'N, 67°36.079'W; 100m ca. 15 km S. Puerto Ayacucho isolated seepage; 13.ix.2007 AS-07-009a; leg. A.E.Z. Short”; 2 labeled “...5°30.623'N, 67°36.109'W; 100m ca. 15 km S. Puerto Ayacucho pool, base of outcrop; 14.ix.2007 AS-07-011a leg. A.E.Z. Short”; 34 labeled “...5°30.623'N, 67°36.109'W; 110m ca. 15 km S. Puerto Ayacucho rock pools et al. leg. A. Short; VZ09-0114-03B”; 1 labeled “...5°36.250'N, 67°34.955'W; 96m just S. of Puerto Ayacucho HG-vapor light; 4.i.2006 AS-06-010; leg. A.E.Z. Short”; 16 labeled “...5°03.707'N, 67°46.768'W; 92m River nr. Orinoco/Sipapo confl. 15.i.2009; leg. Short, Miller, Garcia, Camacho, & Joly VZ09-0115-01X”; 18 labeled “...5°48.414'N, 67°26.313'W, 80m nr. Iboruwa: “Tobogancito” 13.i.2009; leg. A. Short VZ09-0113-02C; river margin”; 3 labeled “...5°48.414'N, 67°26.313'W, 80m nr. Iboruwa: “Tobogancito” 13.i.2009; leg. A. Short; rock pool w/detritus; VZ09-0113-02B”; 3 labeled “...5°48.414'N, 67°26.313'W, 80m nr. Iboruwa: 7.viii.2008; leg. A. Short, M. Garcia, L. Joly AS-08-078; “Tobogancito””; 19 labeled “...5°30.311'N, 67°36.921'W nr. Campamento Canturama 14.i.2009; leg. Short, Camacho, Miller, Garcia, & Joly; Orinoco floodplain pools; VZ09-0114-02A”; 24 labeled “...5°03.707'N, 67°46.768'W; 92m River nr. Orinoco/Sipapo confl. 15.i.2009; shallow backwaters leg. A. Short; VZ09-0115-01C”; 3 labeled “...5°03.707'N, 67°46.768'W; 92m River nr. Orinoco/Sipapo confl. 15.i.2009; Expedition Team VZ09-0115-01A; in/along river”; 2 labeled “...5°16.639'N, 67°48.044'W; 60m ca. 4 km N. Samariapo; small stream @ rd x-ing; 6.i.2006 AS-06-012; leg. A.E.Z. Short”; 3 labeled “...5°20.497'N, 67°45.358'W; 72m ca. 12 km N. Samariapo; small stream @ rd x-ing; 6.i.2006 AS-06-013; leg. A.E.Z. Short”; 1 labeled “...5°32.803'N, 67°26.924'W; 77m ca. 23 km E. Puerto Ayacucho stream @ rd crossing; 6.i.2006 AS-06-014; leg. A.E.Z. Short”; 4 labeled “...5°23.207'N, 67°36.922'W, 125m Tobogan de la Selva; 14.i.2009 leg. Short, Garcia, Miller & Joly wet rock covered w/ detritus VZ09-0114-01F: upstream slide”; 1 labeled “VENEZUELA: Bolivar State 6.58694°N; 67.02912°W Rio Caripito 12.i.2009; leg. Short & Miller VZ09-0112-02B; detrital pool” 24 labeled “VENEZUELA: Bolivar State 6°35.617'N, 66°49.238'W, 80m Los Pijiguaos: outcrop/morichal 12.i.2009; leg. Short, Garcia, Camacho, Miller, & Joly VZ09-0112-01B: marginal algae”; 1 labeled “VENEZUELA: Bolivar State 5°35.617'N, 66°49.238'W, 80m Los Pijiguaos; 6.viii.2008 leg. A.Short, M. Garcia, L. Joly AS-08-076; morichal/rock outcrop”; 1 labeled “VENEZUELA: Bolivar State 6°35.617'N, 66°49.238'W, 80m Los Pijiguaos: outcrop/morichal 12.i.2009; leg. Miller & Short VZ09-0112-01C; detrital pools.” Each paratype with label reading, “PARATYPE: *Incomptodessus comachoi* Miller and Garcia, 2010 [blue label with black line border].”

Checklist of Neotropical Bidessini Genera

Amarodytes Régimbart, 1900

Anodocheilus Babington, 1841

Bidessodes Régimbart, 1900
Bidessonotus Régimbart, 1895
Brachyvatus Zimmermann, 1919
Fontidessus Miller and Spangler, 2008
Hemibidessus Zimmermann, 1921
Hypodessus Guignot, 1939
Incomptodessus Miller and Garcia, 2011
Liodes Guignot, 1939
Microdessus Young, 1967
Neobidessus Young, 1967
Neoclypeodytes Young, 1967
Spanglerodessus Miller and Garcia, 2011
Tepuidessus Spangler, 1981
Trogloguignotus Sanfilippo, 1958
Uvarus Guignot, 1939

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