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# A review of the subtribe Acidocerina of Central America with special reference to Costa Rica (Coleoptera: Hydrophilidae)

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**Abstract**

The Central American members of the subtribe Acidocerina (Coleoptera: Hydrophilidae: Hydrophilini) are reviewed, with an emphasis on the Costa Rican fauna. Six genera are recorded: *Quadriops* HANSEN, *Cymbiodyta* BEDEL, *Enochrus* THOMSON, *Helochares* MULSANT, *Chasmogenus* SHARP, and *Helobata* BERGROTH. Thirty-three species are recorded, including 11 described here as new: *Chasmogenus barrae* sp.n. (Costa Rica), *C. lorenzo* sp.n. (Costa Rica), *C. ruidus* sp.n. (Costa Rica), *C. schoedli* sp.n. (Costa Rica), *E.* (*Methydrus*) *metacarina* sp.n. (Costa Rica, Mexico, Nicaragua), *Enochrus* (*M.*) *rivalis* sp.n. (Costa Rica, Honduras, Nicaragua), *E.* (*M.*) *shepardi* sp.n. (Costa Rica), *E.* (*M.*) *torito* sp.n. (Costa Rica), *E.* (*M.*) *toro* sp.n. (Costa Rica), *E.* (*M.*) *costaricensis* sp.n. (Costa Rica), and *Helochares* (s.str.) *carmona* sp.n. (Costa Rica). Lectotypes are designated for *Helochares championi* SHARP, 1882, *Sindolus optatus* SHARP, 1882 (= *Helochares optatus*) and *Philydrus debilis* SHARP, 1882 (= *Enochrus debilis*). A key to the genera and species of Acidocerina of Central America is provided and habitat preferences discussed. The male genitalia for all new and some previously described species are illustrated.

**Key words**: Coleoptera, Hydrophilidae, Hydrophilini, Acidocerina, Central America, Costa Rica, new species, taxonomy.

## Introduction

The Hydrophilidae of Central America have received little attention in the more than 120 years since the extensive treatment of the fauna by Sharp (1882). With the exception of a few genera (e.g. *Chaetarthria* MILLER 1974), no modern reviews or identification resources existed until recently (e.g. SHORT 2004b, SHORT & PERKINS 2004). Species identifications within the genera *Enochrus* THOMSON and *Helochares* MULSANT have been especially difficult, if not impossible, because of the large number of undescribed and morphologically similar species. Some species have not been recorded since their description.

This paper is a result of my ongoing studies of the Hydrophilidae of Costa Rica sponsored by the Instituto Nacional de Biodiversidad (INBio). In an attempt to make this work as broadly applicable as possible, I have covered all species of Acidocerina known to occur in Central America. However, because the amount of material reviewed from outside Costa Rica was comparatively sparse, additional species will almost undoubtedly be discovered in the future.

The Central American Acidocerina fauna shares elements with both North and South America, although nearly half the species are currently not known from outside the region (two-thirds if Mexico is included). Several distinctly Nearctic taxa have ranges extending at least into Guatemala or Belize (e.g. *Cymbiodyta* BEDEL, *Helochares maculicollis* MULSANT, *H. normatus* LECONTE, *Enochrus sayi* GUNDERSEN). Other elements are more closely associated with South America and have ranges that extend northward at least as far as Costa Rica (e.g. *Quadriops* HANSEN, *Helochares abbreviatus* (F.)).

I was able to conduct extensive fieldwork in Costa Rica during five visits to the country (either in January or June), collecting at more than 50 sites. In general terms, most species of Acidocerina can be separated into two habitat types: stagnant water (e.g. marshes, pond margins, wet fields) or lotic systems (e.g. stream and river margins, backwaters of streams, and less frequently hygropetric habitats). Specific preferences are provided in the remarks of each species, if known. The dry forests in Guanacaste Province were especially diverse in taxa; collecting there can be extremely productive in the early dry season as streams are broken into isolated pools and many taxa are dispersing. A few taxa appear to be restricted to higher elevations (e.g. over 500 m), probably because they are more dependant on the swift streams and wet-rock faces not found in lower, flatter areas.

For many collecting events, locality codes are given under material examined when they exist (such as "AS-04-033"). For most of these codes, additional information and photographs of the locality are available from the author upon request.

## Material & methods

All specimens were examined using a binocular Wild M-5 microscope to 100x magnification. Measurements were taken with the aid of an ocular micrometer. Drawings were made with the assistance of an ocular grid, carmera lucida, and digital photographs. Terminology largely follows HANSEN (1991).

Abbreviations:

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| AEZS | Collection of the A.E.Z. Short, Ithaca, New York, USA |
| B.C.A. | Biologia Centrali-Americana |
| BMNH | The Natural History Museum, London, UK (C. Taylor) |
| CUIC | Cornell University, Ithaca, NY, USA (J.K. Liebherr, R. Hoebeke) |
| EMEC | Essig Museum of Entomology, University of California, Berkeley, CA, USA (C.B. Barr) |
| INBio | Instituto Nacional de Biodiversidad, Santo Domingo de Heredia, Costa Rica (Á. Solís) |
| MALUZ | Museo de Artrópodos de la Universidad del Zulia, Maracaibo, Venezuela (M. García) |
| MCZ | Museum of Comparative Zoology, Harvard University, Cambridge, MA, USA (P.D. Perkins) |
| MFC | Collection of Martin Fikáček, Prague, Czech Republic |
| NMW | Naturhistorisches Museum Wien, Austria (M.A. Jäch, A. Komarek) |
| TAMU | Texas A & M University, College Station, Texas, USA (E. Riley) |
| UDCC | University of Delaware Reference Collection, Newark, Delaware, USA (C.R. Bartlett) |
| UMC | University of Manitoba, Winnipeg, Canada (R.E. Roughley) |
| USNM | U.S. National Museum of Natural History, Washington, DC, USA (P.J. Spangler, W. Steiner) |

## Checklist of Acidocerina occurring or likely to occur in Central America

1. *Chasmogenus barrae* sp.n.
2. *C. fragilis* SHARP, 1882
3. *C. lorenzo* sp.n.
4. *C. ruidus* sp.n.
5. *C. schoedli* sp.n.
6. *Cymbiodyta polita* (SHARP, 1882)
7. *Enochrus* (*Hugoscottia*) *talamanca* SHORT, 2005
8. *E.* (*Methydrus*) *aequalis* (SHARP, 1882)
9. *E.* (*M.*) *costaricensis* sp.n.
10. *E.* (*M.*) *debilis* (SHARP, 1882)
11. *E.* (*M.*) *metacarina* sp.n.
12. *E.* (*M.*) *obscurus* (SHARP, 1882)
13. *E.* (*M.*) *ochraceus* (MELSHEIMER, 1844)
14. *E.* (*M.*) *pseudochraceus* GUNDERSEN, 1977
15. *E.* (*M.*) *pygmaeus* (F., 1792)
16. *E.* (*M.*) *rivalis* sp.n.
17. *E.* (*M.*) *sayi* GUNDERSEN, 1977
18. *E.* (*M.*) *sharpi* GUNDERESEN, 1977
19. *E.* (*M.*) *shepardi* sp.n.
20. *E.* (*M.*) *sublongus* (FALL, 1926)
21. *E.* (*M.*) *torito* sp.n.
22. *E.* (*M.*) *toro* sp.n.
23. *Helobata larvalis* (HORN, 1873)
24. *Helochares* (s.str.) *abbreviatus* (F., 1801)
25. *Helochares* (s.str.) *carmona* sp.n.
26. *H.* (s.str.) *oculatus* SHARP, 1882
27. *H.* (s.str.) *sallaei* SHARP, 1882
28. *H.* (*Hydrobaticus*) *championi* SHARP, 1882
29. *H.* (*H*). *maculicollis* MULSANT, 1844
30. *H.* (*H.*) *normatus* (LECONTE, 1861)
31. *H.* (*Sindolus*) *mundus* (SHARP, 1882)
32. *H.* (*S.*) *optatus* (SHARP, 1882)
33. *Quadriops reticulatus* HANSEN, 1999

### Key to the Genera of Acidocerina of Central America

1 Eyes entire, not divided into dorsal and ventral sections by frons. Size variable but almost always larger than 2.5 mm ..... 2

– Eyes divided into dorsal and ventral sections by lateral canthus of frons. Size less than 2.5 mm ..... ***Quadriops*** **HANSEN**

2 Elytra with sutural stria at least in posterior half, tarsi 5-5-5 or 5-4-4, second (pseudobasal) segment of maxillary palpi bowed inward or outward ..... 3

– Elytra without sutural stria, tarsi 5-5-5, second (pseudobasal)segment of maxillary palpi bowed outward ..... ***Helochares*** **MULSANT**

3 Second (pseudobasal) segment of maxillary palpi distinctly bowed outward. Mesosternum with a laminar, longitudinal carina, usually broadly triangular and angulate... ***Enochrus*** **THOMSON**

– Second (pseudobasal) segment of maxillary palpi normal, bowed inward. Mesosternum without laminar, longitudinal carina. ..... 4

4 Tarsi 5-4-4. Labrum exposed. Mesosternum with a transverse ridge or tooth (known as far south as Guatemala)..... ***Cymbiodyta*** **BEDEL**

Tarsi 5-5-5. Labrum exposed or concealed by clypeus. Mesosternum without transverse ridge or tooth..... 5

5 Labrum concealed by clypeus; elytral and pronotal margins explanate. Size greater than 5.0 mm ..... ***Helobata*** **BERGROTH**

– Labrum not concealed by clypeus; elytral and pronotal margins not explanate. Size less than 4.0 mm ..... ***Chasmogenus*** **SHARP**

## Genus *Chasmogenus* SHARP

*Chasmogenus* SHARP, 1882: 73.
*Crephelochares* KUWERT, 1890: 38. – Syn.: d'ORCHYMONT 1919: 148.

First described by SHARP (1882) from a single species from Guatemala, this genus has expanded to include representatives in all biogeographic regions except the Nearctic. Recently, GARCÍA (2000c) described four species from Venezuela and presented a key to the Neotropical species. Here, four additional new species are described from Costa Rica.

### Key to the species of *Chasmogenus* of Central America

1 General dorsal punctures of elytra and pronotum fine, much smaller than systematic punctures..... 3

– General dorsal punctures of elytra and pronotum moderately coarse, equal to or only slightly smaller than systematic punctures. ..... 2

2 General punctation on elytra distinct and coarse, generally obscuring systematic punctures, especially on anterior half. Fifth ventrite truncate to slightly emarginate posteromedially. Dorsal coloration usually light to medium brown ..... ***ruidus*** **sp.n.**

– General punctation on elytra distinct but slightly smaller than systematic punctures anteriorly, and becoming smaller and more diffuse posteriorly. Fifth ventrite distinctly emarginate posteromedially. Dorsal coloration usually brown to dark brown…… ..... ***schoedli*** **sp.n.**

3 Size greater than 3.6 mm. Coloration light to medium brown. ..... ***fragilis*** **SHARP**

– Size less than 3.3 mm. Coloration usually dark brown ..... 4

4 Inner margin of parameres emarginated on dorsal face (Fig. 1). Anterior margin of clypeus triangular, with distinct notch at central apex..... ***barrae* sp.n.**

– Inner margin of parameres not emarginate on dorsal face; at most appearing sinuate (Fig. 3). Anterior margin of clypeus triangular but without central notch ..... ***lorenzo* sp.n.**

## *Chasmogenus barrae* sp.n.

(Fig. 1)

TYPE LOCALITY: 10°09.455' N, 85°22.793' W, Pools in dry creek, road to Barra Honda National Park, 6.6 km after junction with route 13, Guanacaste Province, Costa Rica.

TYPE MATERIAL: **Holotype** (♂): "COSTA RICA: Guanacaste Prov./ road to Barra Honda, 6.6 km after / rt. 13, remnant pools in dry creek/ 13.I.2004; AS-04-037, gravel bottom/ AEZShort & DJLebbin, 50m elev.", "HOLOTYPE/ Chasmogenus/ barrae/ A. E. Z. Short" (INBio). **Paratypes (8): COSTA RICA: Guanacaste Prov.:** Same data as holotype (5: AEZS, EMEC, INBio); near Carmona, Carmona-Bella Vista Road, 465 m, 16.i.2003, 'stream with pools', leg. A.E.Z. Short (1: AEZS); Santa Cruz, Bosque Diriá Station, 150–250 m, (20–27).xi.1998, leg. J. Matarrita (1: INBio). **Puntarenas Prov.:** Quebrada Bonita Station, "R. B. Carara (Aguirre)", 50–100 m, iv.1995, leg. R. Guzman (1: INBio); same locality but vi.1993 (1: INBio).

DIFFERENTIAL DIAGNOSIS: Dorsal coloration generally dark brown. The smaller size and fine general punctation of the elytra are shared with *C. lorenzo*, from which it can be distinguished by the distinct shape of the aedeagus and small notch in the center of the clypeo-labrum margin.

DESCRIPTION: Total length 3.0–3.2 mm. Form elongate oval.

Color & Punctation: Head brown to dark brown. Pronotum brown to dark brown with pale lateral margins. Elytra brown to dark brown. Maxillary palpi uniformly yellow. Ventral surface of head light brown to brown with mentum and stipes usually slightly paler. Thoracic and abdominal ventrites light brown to brown, slightly darkening laterally. Legs same color as the thoracic sternum. General punctation on elytra moderately fine, distance between punctures 1.5–2.5x width of one puncture; elytral rows of irregular and sparse systematic punctures distinct, systematic punctures ca. 3x larger than general punctation and bearing short fine setae. General punctation of head and pronotum similar to elytra. Systematic punctures of head (on the frons, mesad to each eye) and pronotum (anterolateral rows) very distinct and setiferous.

Head: Maxillary palpi subequal in length as the width of head at widest point; apical segment subequal in length to penultimate segment, segment 2 slightly longer than penultimate segment. Clypeo-labral margin with triangular emargination, but lacking a distinct medial notch. Mentum glabrous and nearly impunctate, with deep notch on anterolateral margin and generally depressed on anterocentral half.

Thorax: Prosternum finely pubescent, finely carinate along posterior half, tectiform on anterior half. Mesosternum bearing a low longitudinal ridge, slightly buldged centrally with a very low posteriorly pointing tooth at the apex, bearing a few sparse, short setae; mesosternal sclerite with faint microsculpture on central 2/3. Metasternum with elongate oval glabrous area posteromedially, about as long as wide; glabrous area less than half the total length of the metasternum. Hind femora pubescent on basal 4/5. Elytra with sutural stria in from apex to posterior 3/4–4/5.

Abdomen: Ventrites densely pubescent, with pubescence on first ventrite slightly less dense centrally. Fifth ventrite with shallow posteromedial emargination, distinctly wider than deep and lined with coarse yellow setae. Aedeagus (Fig. 1) with inner margin of parameres emarginated on dorsal face; apex of parameres broadly sinuate.

DISTRIBUTION: Costa Rica.

ETYMOLOGY: Named in honor of fellow aquatic Coleopterist Cheryl B. Barr.

REMARKS: The type series was collected at the gravel/sand margin of a pool that had formed in the bed of a drying stream in the dry forest. This was also the collecting site of a number of other families of Hydrophiloidea, including Georissidae and Epimetopidae.

### *Chasmogenus fragilis* SHARP

*Chasmogenus fragilis* SHARP, 1882: 72.
*Helochares* (*Chasmogenus*) *fragilis* SHARP, 1882. – KNISCH 1924: 195.

TYPE MATERIAL EXAMINED: **Lectotype** (♀): "Chasmogenus/ fragilis/ Type D. S./ S. Geronimo. Guatemala/ Champion" [on specimen card], "Syn-Type" [blue disc], "Type" [red disc, upside down], "San Geronimo/ Vera Paz/ Champion.", "Sharp Coll./ 1905.-313.", "B. C. A. Col. I. 2./ Chasmogenus/ fragilis,/ Sharp.", "LECTOTYPE/ Chasmogenus/ fragilis/ Sharp/ See Fernández 1986/ Labeled by A. Short 2004". (BMNH). **Paralectotypes** (2 ♀♀): same locality as lecotype (BMNH).

DIFFERENTIAL DIAGNOSIS: Total length 3.65 mm. Form elongate oval. The larger size, in addition to the distinct notch-like emargination on the anterior margin of the clypeus and the nearly impunctate elytra, will differentiate this species from the other Central American species.

DISTRIBUTION: Guatemala, Panama (HANSEN 1999b).

REMARKS: A lectotype was designated and redescribed by FERNÁNDEZ (1986), but it was not labelled as such. I added the label mentioned above under type material to clearly mark the indicated specimen. No other specimens other than the type material of this species were seen.

### *Chasmogenus lorenzo* **sp.n.**
(Fig. 3)

TYPE LOCALITY: Unnamed stream near Río San Lorenzo, Alajuela Province, Costa Rica.

TYPE MATERIAL: **Holotype** (♂): "COSTA RICA: Alajuela Prv./ Small stream near Rio/ San Lorenzo; 6km from Los/ Lagos; 12.VI.2003; A.E.Z.Short", "HOLOTYPE/ Chasmogenus/ lorenzo/ A. E. Z. Short" (INBio). **Paratypes (2): COSTA RICA: Alajuela Prov.:** Same data as holotype (2: AEZS, INBio).

DIFFERENTIAL DIAGNOSIS: The combination of smaller size, fine dorsal punctation, and darker coloration will separate this species from all others except *Chasmogenus barrae*, which can be distinguished from *C. lorenzo* by the presence of a notched anterior margin of the clypeus and distinctive aedeagus.

DESCRIPTION: Total length 3.1–3.2 mm. Form elongate oval.

Color & Punctation: Head dark brown to black. Pronotum dark brown with pale lateral margins. Elytra dark brown. Maxillary palpi uniformly yellow. Ventral surface of head dark brown with mentum and stipes usually slightly paler. Sternum and abdominal ventrites brown, slightly darkening laterally. Legs brown. General punctation on elytra fine, distance between punctures 1–2x width of one punctures; elytral rows of irregular and sparse systematic punctures distinct, punctures larger than general punctation and bearing short fine setae. General punctation of head and pronotum similar. Systematic punctures of pronotum (anterolateral rows) and head (on the frons, mesad to each eye) very distinct and bearing setae.

Head: Maxillary palpi subequal in length as the width of head at widest point; apical segment subequal in length to penultimate segment, segment 2 slightly longer than penultimate segment. Clypeo-labral margin with triangular emargination, but lacking a distinct medial notch. Mentum glabrous and nearly impunctate, with deep notch on anterolateral margin and generally depressed on anterocentral half.

Thorax: Prosternum finely pubescent, finely carinate along posterior half, tectiform on anterior half. Mesosternum bearing a low longitudinal ridge, slightly buldged centrally, posteriorly pointing tooth nearly obsolete, apex bearing a few sparse, short setae; mesosternal sclerite with faint microsculpture on central 2/3. Metasternum with elongate oval glabrous area posteromedially, slightly longer than wide; glabrous area about half the total length of the metasternum. Hind femora pubescent on basal 4/5. Elytra with sutural stria from extending from apex to posterior 3/4–4/5.

Abdomen: Ventrites densely pubescent, with pubescence on first ventrite slightly less dense centrally. Fifth ventrite with shallow posteromedial emargination, distinctly wider than deep and lined with coarse yellow setae. Aedeagus (Fig. 3) with inner margins of parameres straight to slightly sinuate on inner face; apex of parameres sinuate, with a small projection apicomedially.

DISTRIBUTION: Costa Rica.

ETYMOLOGY: Named after the Río San Lorenzo, very near the unnamed tributary in which the type series was collected.

REMARKS: This species was collected by disturbing gravel and detritus along the margin of a swift, small stream in a dense cloud forest.

### *Chasmogenus ruidus* sp.n.
(Fig. 4)

TYPE LOCALITY: Farm of Elias Rojas, Sector Cerro Cocori, Limón Province, Costa Rica.

TYPE MATERIAL: **Holotype** (♂): "Sector Cerro Cocori, Finca de Elias/ Rojas, A. C. Tortuguero, Prov. Limón,/ COSTA RICA. 100m. Set. 1993. K./ Kjer, L N 286000_567500 #2411", "HOLOTYPE/ Chasmogenus/ ruidus/ A. E. Z. Short" (INBio). **Paratypes (53): COSTA RICA: Alajuela Prov.:** near Catarata del Toro, pools by road at Río Desague, 1330 m, 15.i.2004, leg. A.E.Z. Short & D.J. Lebbin, AS-04-051 (1: AEZS). **Cartago Prov.:** Tapantí National Park, 1–2 km past ranger station, pools at base of cascade, 10.i.2005, leg. A.E.Z. Short, J. Hannam & A. Swanson, AS-05-139 (49: AEZS, INBio, NMW). **Limón Prov.:** Sector Cerro Cocori, Finca de E. Rojas, 150 m, viii.1991 (1: AEZS); Valle del Silencio, R. B. Hitoy Cerere, Sendero Toma de Agua, 100–140 m, 17.ii.–17.iii.2000, leg. F. Umaña, malaise trap (1: INBio); Valle de la Estrella, Station Hitoy Cerere, 160 m, 30.ix.2000, "aquaticos", leg. W. Aranas (1: INBio).

DIFFERENTIAL DIAGNOSIS: Distinguished from other Central American members of the genus by the coarse dorsal punctation and very shallow or truncate posterior margin of the fifth ventrite. Similar to *C. schoedli* (described below) but without the punctures becoming distinctly fine on posterior half of elytra, the emargination of the fifth ventrite being deeper, and the doral side being generally lighter in coloration. *Chasmogenus fragilis*, *C. lorenzo* and *C. barrae* all have much finer elytral punctation, and the latter two are more darkly colored.

DESCRIPTION: Total length 2.8–3.0 mm. Form elongate oval.

Color & Punctation: Dorsum including head, pronotum and elytra uniformly light to medium brown with lateral margins often slightly paler. Maxillary palpi uniformly yellow. Venteral face, including sternum, ventrites and legs uniformly light to medium brown. General punctation on elytra moderately coarse, distance between punctures 1.0–1.5x width of one puncture; similar in size as the irregularly spaced systematic punctures, which are only distinguishable by the presence of a short, fine seta. General punctation of head and pronotum similar but slightly denser. Anterolateral row of dense systematic punctures on pronotum present and distinguishable.

Head: Maxillary palpi slightly longer than width of head at widest point; apical segment subequal in length to penultimate segment, segment 2 slightly longer than penultimate segment. Clypeo-labral margin with triangular emargination, exposing a small gap between the clypeus

and labrum. Mentum glabrous and nearly impunctate, with deep notch on anterolateral margin and generally depressed on anterocentral half.

Thorax: Prosternum finely pubescent, finely carinate along posterior half, tectiform on anterior half. Mesosternum bearing a low longitudinal ridge, slightly buldged centrally with a very low apex bearing a few sparse, short setae; mesosternal sclerite with distinct microsculpture on central 2/3. Metasternum with elongate oval glabrous area posteromedially, slightly longer than wide; glabrous area slightly more than half the total length of the metasternum. Hind femora pubescent on basal 3/4. Elytra with sutural stria in posterior 3/4.

Abdomen: Ventrites densely pubescent, with pubescence on first ventrite slightly less dense centrally. Fifth ventrite with shallow posteromedial emargination, distinctly wider than deep, and lined with coarse yellow setae. Aedeagus (Fig. 4) with inner margins of parameres straight to slightly curved on inner face; apex of parameres sinuate, with a small projection apicomedially.

DISTRIBUTION: Costa Rica.

ETYMOLOGY: *ruidus* (Latin), referring to the relatively coarse dorsal punctation. Used as a noun in apposition.

REMARKS: At Tapantí National Park, a long series was collected in pools on the forest floor made by a small cascade; specimens were collected by agitating the dead leaves and detritus in the pools and collecting the specimens that floated to the surface. At other localities, a specimen of this species was collected in the very shallow pools formed at the base of several rock seepages, with detritus and algae. Another specimen was taken in a malaise trap.

### ***Chasmogenus schoedli*** **sp.n.**
(Fig. 2)

TYPE LOCALITY: Pitilla Station, 9 km S Santa Cecelia, Guanacaste Province, Costa Rica.

TYPE MATERIAL: **Holotype** (♂): "Est. Pitilla, 9 km S. Sta. Cecilia, Prov./ Guana, COSTA RICA. 700m, 22 Ago 1993./ C. Moraga, L N 330200_380200 #2322", "HOLOTYPE/ Chasmogenus/ schoedli/ A. E. Z. Short" (INBio). **Paratypes (2): COSTA RICA: Limón Prov.:** Sector Cerro Cocori, Finca de E. Rojas, leg. E. Rojas, 150 m, v.1991 (1: AEZS); same locality but iii.1992 (1: INBio).

DIFFERENTIAL DIAGNOSIS: Most similar to *C. ruidus*, but generally darker in dorsal coloration and with punctation slightly finer on anterior half of elytra, and becoming much finer and more diffuse in posterior half.

DESCRIPTION: Total length 3.2–3.3 mm. Form elongate oval.

Color & Punctation: Dorsum including head, pronotum and elytra medium brown with lateral margins slightly paler. Maxillary palpi uniformly yellow. Ventral surface, including sternum, ventrites and legs uniformly light to medium brown; mentum and stipes slightly paler than ventral surface of head. General punctation on elytra moderately impressed anteriorly, becoming distinctly finer and less impressed posteriorly; distance between punctures 1.0–1.5x width of one puncture anteriorly, becoming more diffuse posteriorly; similar in size to slightly smaller than the irregularly spaced systematic punctures. General punctation of head and pronotum similar but slightly denser. Anterolateral row of dense systematic punctures on pronotum and mesad of each eye on the frons present and distinguishable.

Head: Maxillary palpi slightly longer than width of head at widest point; apical segment subequal in length to penultimate segment, segment 2 slightly longer than penultimate segment. Clypeo-labral margin triangular, with a small notch at the apex, exposing a small gap between the clypeus and labrum. Mentum glabrous and nearly impunctate, with deep notch on anterolateral margin and generally depressed on anterocentral half.

Thorax: Prosternum finely pubescent, finely carinate along posterior half, only tectiform on anterior half. Mesosternum bearing a low longitudinal ridge, with a small, almost indistinct posteriorly pointing tooth or angulate apex bearing a few sparse, short setae; mesosternal sclerite with distinct microsculpture on central 2/3. Metasternum with elongate oval glabrous area posteromedially, slightly longer than wide; glabrous area slightly more than half the total length of the metasternum. Hind femora pubescent on basal 3/4. Elytra with sutural stria in posterior 3/4.

Abdomen: Ventrites densely pubescent, with pubescence on first ventrite slightly less dense centrally. Fifth ventrite with a distinct posteromedial emargination, distinctly wider than deep and lined with coarse yellow setae. Aedeagus (Fig. 2) with inner margins of parameres straight to slightly curved on inner face; apex of parameres slightly to not sinuate, without or with only a small projection apicomedially.

DISTRIBUTION: Costa Rica.

ETYMOLOGY: Named for Stefan Schödl (Vienna), who worked on the taxonomy of Hydrophilidae for ten years and who produced excellent revisions and species descriptions in this family.

REMARKS: Nothing is known about the habitat of this species.

## Genus *Cymbiodyta* BEDEL

*Cymbiodyta* BEDEL, 1881: 307.
*Hydrocombus* SHARP, 1882: 70. – Syn.: HORN 1890: 240.

This largely Nearctic genus was revised by SMETANA (1974). One species is Palearctic, and one species has a range that extends into Central America.

### *Cymbiodyta polita* (SHARP)

*Hydrocombus politus* SHARP, 1882: 72.
*Cymbiodyta polita* (SHARP, 1882). – ZAITZEV 1908: 391.

MATERIAL EXAMINED: None seen.

DIAGNOSIS: Total length 3.8–4.5 mm. *Cymbiodyta polita* is the only species of the genus that occurs in the region. It can be distinguished by the four-segmented middle and hind tarsi and the transverse mesosternal ridge.

DISTRIBUTION: Mexico, Guatemala (SMETANA 1974).

REMARKS: It seems unlikely that the range of this species (and genus) extends much farther south. The genus is primarily an element of the Nearctic fauna, with only the range of this one southern species extending into Central America.

## Genus *Enochrus* THOMSON

The genus *Enochrus* contains sixteen species in Central America, six of which are described here as new. There are many additional recorded and unrecorded species occurring in Mexico, and so the key presented here cannot be used reliably for the fauna of Mexico, especially in the northern half of the country whose fauna is largely Nearctic.

## Taxonomic problems in Middle American *Enochrus*

The taxonomy of *Enochrus* has long been problematic because of the large number of morphologically similar species groups with often broad geographic distributions. The Nearctic fauna (and some of the Central American and Caribbean fauna) was revised by GUNDERSEN (1977, 1978). However, this treatment has proven unsatisfactory and contains a number of errors (see HILSENHOFF 1995, SHORT 2003a,b, SHORT 2004a).

Making matters even more problematic, the holotypes of several species supposedly deposited at the United States National Museum cannot be found, and are here considered missing pending a later determination if they are in fact permanently lost. On a visit to the USNM in November of 2004, I was unable to find the holotypes of *E. pseudochraceus* GUNDERSEN and *E. sharpi* GUNDERSEN. It is unclear weather the specimens were ever returned; however, other species described by Gundersen are known to have been returned to other institutions (e.g. *E. aridus*, *E. interruptus*, and *E. sayi* at CUIC, *E. negrus* at the California Academy of Sciences).

The identity of the very distinctive *E. pseudochraceus* is not in question. While *E. sharpi* is very similar to what is now *E. metacarina*, it is clear from other specimens identified by P. Spangler and R. Gundersen that the latter species was confused with *E. aequalis* SHARP and thus not previously recognized as new; combined with the very distinctive aedeagus, I have little reservation in naming *E. metacarina* without locating the type of *E. sharpi*.

Paratypes of the Mexican *E. spangleri* SANTIAGO-FRAGOSO & MEJORADA-GOMEZ that were published as being deposited in the USNM are also missing. The exact identity of *E. spangleri* is largely unknown because the description does not mention any characters that are used to differentiate species. It was not placed in a subgenus and the characters used for this placement are also not provided in the description. The authors compare it to the Nearctic *E. cristatus*, implying a placement in the subgenus *Methydrus*. The aedeagus illustration is similar to that of *E. aequalis* (SHARP), although more comparisons are needed to determine this.

## Key to the species of *Enochrus* of Central America

| | | |
|---|---|---|
| 1 | Mesosternal carina very low; rounded or nearly rounded and with a small backwardly pointing tooth. Prosternum without carination or anteromedial tooth | 2 |
| – | Mesosternal carina angulate, forming a broad triangular or rectangular lamina. Prosternum with or without carina | 5 |
| 2 | Mesosternal carina low and rounded, without a posteriorly directing tooth; tips of parameres straight. Color of pronotal disc light or dark | 3 |
| – | Mesosternal carina with small posteriorly pointing tooth; tips of parameres outwardly curved (Fig. 12). Pronotal disc darkened | ***pseudochraceus* GUNDERSEN** |
| 3 | Size smaller than 4.5 mm | 4 |
| – | Size larger than 4.5 mm | ***obscurus* (SHARP)** |
| 4 | Size generally larger. Epipleura generally dark in color, the same color as the mesosternum. Notch of fifth abdominal ventrite larger, broad | ***ochraceus* (MELSHEIMER)**[1] |
| – | Size generally smaller. Epipleura generally distinctly paler in color than mesosternum. Notch of fifth abdominal ventrite narrower, deep. | ***sublongus* (FALL)**[1] |
| 5 | Prosternum without carination or anteromedial tooth | 6 |
| – | Prosternum distinctly carinate at least on apical third | 9 |

[1] The key follows the Nearctic convention for the separation of *E. ochraceus* from *E. sublongus*. See remarks under *E.* sp. A.

6 Metasternum not carinate. Mesosternal crest smaller, broader..... 7

– Metasternum finely carinate on anteromedial quarter to third. Mesosternal crest larger, thinner..... 8

7 Third segment of maxillary palpi not swollen. Pronotal disc not darkened ..... ***debilis* (SHARP)**

– Third segment of maxillary palpi swollen. Pronotal disc distinctly darkened..... ***costaricensis* sp.n.**

8 Dorsal strut distinctly rising above median lobe (Fig. 7). Mesosternal crest broadly rectangular, with margin extending posteriorly to narrowly meet a small metasternal carina ..... ***sharpi* GUNDERSEN**

– Dorsal strut not rising above median lobe (Fig. 8). Mesosternal crest broad but not extending to the metasternum..... ***metacarina* sp.n.**

9 Mesosternal carina with transverse ridges on each side. Apex of parameres curved inward (Fig. 5) ..... ***talamanca* SHORT**

– Mesosternal carina without transverse ridges. Apex of parameres not curved inward..... 10

10 Prosternum distinctly carinate along entire length. Pronotal disc usually not darkened ..... 14

– Prosternum carinate only on anterior third, often appearing as an angulate tooth. Pronotal disc usually distinctly darkened ..... 11

11 Size usually larger than 3.5 mm. Dorsal strut never rising above median lobe (Figs. 9–10) ..... 12

– Size usually smaller than 3.5 mm. Dorsal strut rising above median median lobe or not (Figs. 15–16)..... 13

12 Aedeagus with base of parameres distinctly divided on ventral face; apex of parameres evenly narrowed (Fig. 9) ..... ***aequalis* (SHARP)**

– Aedeagus with base of parameres parallel on ventral face; apex of parameres tapered, more narrowed apically (Fig. 10)..... ***toro* sp.n.**

13 Aedeagus with dorsal strut rising above median lobe; inner margins of parameres overlapping on ventral face (Fig. 16). Head and center of clypeus usually black or at least dark brown……. ..... ***rivalis* sp.n.**

– Aedeagus with dorsal strut not rising above median lobe; inner margins of parameres not overlapping (Fig. 15). Head and center of clypeus usually light to medium brown..... ***torito* sp.n.**

14 Mesosternal carina glabrous, acutely pointed. Dorsal punctation usually fine to moderately fine..... 15

– Mesosternal carina setiferous, broadly triangular and obtusely pointed. Dorsal punctation usually coarse (south to Belize)..... ***sayi* GUNDERSEN**

15 Total length 4.0 mm or larger..... ***shepardi* sp.n.**

– Total length 3.5 mm or smaller..... ***pygmaeus* (F.)**

## Subgenus *Hugoscottia* KNISCH

*Hugoscottia* KNISCH, 1922: 89.

The range of this subgenus was recently extended northward with the description of one species each from Mexico and Costa Rica (SHORT 2005); it was previously only known as far north as central South America.

### *Enochrus* (*H.*) *talamanca* SHORT
(Fig. 5)

*Enochrus* (*Hugoscottia*) *talamanca* SHORT, 2005: 4.

TYPE MATERIAL EXAMINED: **Holotype** (♂): "COSTA RICA: Cartago Pr./ Tapanti National Park/ pools along entrance road/ A. E. Z. Short; 22-VI-2003", "HOLOTYPE/ Enochrus (H.)/ talamanca/ A. E. Z.Short". (INBio).

**Paratypes (32): COSTA RICA: Cartago Prov.:** same data as holotype (21: AEZS, INBio); Tapantí National Park, Quebrada Segunda, 1250 m, iii.1992, leg. G. Mora (10: INBio); same locality but viii.1992 (1: INBio).

ADDITIONAL MATERIAL EXAMINED (27): **COSTA RICA: Cartago Prov.:** Tapantí National Park, 1–2 km past ranger station, pools at base of cascade, 10.i.2005, leg. A.E.Z. Short, J. Hannam & A. Swanson, AS-05-139 (13: AEZS); Tapantí National Park, pools along entrance road, 10.i.2005, leg. J.J. Hannam (14: AEZS).

DIFFERENTIAL DIAGNOSIS: Total length 3.0–3.5 mm. The transverse ridges of the mesosternum serve to distinguish this species from all other known species in Central America. The dark brown coloration, generally coarse punctation, and distinct genitalia also serve to differentiate this species.

DISTRIBUTION: Known only from Tapantí National Park, Costa Rica.

REMARKS: This species has been encountered on several occations in shallow pools and mud puddles along the sides of a gravel road in Tapantí National park. It appeared to be living in and around clumps of emergent grass. On one collecting event, specimens were clinging to the underside of a *Cecropia* leaf that had landed in a puddle.

## Subgenus *Methydrus* Rey

*Methydrus* REY, 1885: 253.

This common and cosmopolitan subgenus is the most frequently encountered and abundant group of Acidocerina in Central America.

### *Enochrus* (*M.*) *aequalis* (SHARP)
(Fig. 9)

*Philydrus aequalis* SHARP, 1882: 68.
*Enochrus* (*Lumetus*) *aequalis* (SHARP). – ZAITZEV 1908: 385.
*Enochrus* (*Methydrus*) *aequalis* (SHARP). – d'ORCHYMONT 1939: 374.
Not *Enochrus* (*Methydrus*) *aequalis* (SHARP). – SPANGLER 1981: 157; SHORT 2004a: 352.

TYPE MATERIAL EXAMINED: **Lectotype** (♀): "Philydrus aequalis/ Type D. S./ Guatemala City/ Champion" [on same card as specimen], "LECTO-TYPE" [purple disc], "Syn-Type" [blue disc], "Type" [red disc], "Guatemala City/ 500 ft./ Champion.", "Sharp Coll./ 1905.-313.", "B.C.A. Col. I. 2./ Philydrus/ aequalis,/ Sharp.", "LECTOTYPUS/ E. aequalis Sharp [reverse side: Fernández 1994]".

ADDITIONAL MATERIAL EXAMINED (15): **GUATEMALA:** 10 mi. E Guatemala City, 6.viii.1965, leg. P.J. Spangler (14: AEZS, USNM); Estancia Virgen, 12.viii.1965, leg. P.J. Spangler (1: USNM).

DIFFERENTIAL DIAGNOSIS: Total length 3.5–4.2 mm. The broadly oval body form, pronotum distinctly darkened on the central disc, prosternum carinate on the anterior third, and robust, triangular crest of the mesoventrite serve to characterize this species, which are also shared with *E. toro*. It can be distinguished from *E. toro* by the inner margins of the parameres divergent, separated the entire length of the ventral face (Fig. 9), and the slightly broader notch of the fifth ventrite. It can be distinguished from *E. torito* by the generally larger size and broader body form.

DISTRIBUTION: Confirmed only from Guatemala.

REMARKS: GUNDERSEN (1977, 1978) did not treat *E. aequalis* directly but compared it to *E. sharpi* GUNDERSEN when he described that species (GUNDERSEN 1977: 264, 1978: 33). Based on specimens bearing Gundersen's identification label and material identified by P. Spangler, these references to *E. aequalis* actually refer to *E. metacarina*. Recent applications of *E. aequalis* to Caribbean specimens (e.g. SPANGLER 1981, SHORT 2004a) also refer to *E. metacarina*. This

confusion may be at least in part due to the fact that both *E. aequalis* and *E. metacarina* have the dorsal strut not rising above the median lobe.

### ***Enochrus* (*M.*) *costaricensis* sp.n.**
(Fig. 6)

TYPE LOCALITY: Hamburg Farm, Limón Province, Costa Rica.

TYPE MATERIAL: **Holotype** (♂): "COSTA RICA/ F NEVERMAN/ 16 T 36/", "HAMBURGFARM REVETAZON/ EBENE LIMON [reverse side of top label]", "[handwriting on second label illegible]". "HOLOTYPE/ Enochrus (M.)/ costaricensis/ A. E. Z. Short 2004" (USNM).

DIFFERENTIAL DIAGNOSIS: Prosternum not carinate. Pronotum distinctly darkened on disc. Maxillary palpi with penultimate segment broadly swollen and flattened on inner face. Similar to *E. debilis*, which does not share the latter two characters. Superficially similar in size and shape to *E. rivalis*, but that species has an anteriorly carinate prosternum.

DESCRIPTION: Total length 3.0 mm. Form moderately oval; moderately convex.

Color & Punctation: Elytra light brown. Pronotum yellowish brown with central disc darkened. Top of head and central third of clypeus dark brown, lateral thirds of clypeus light brown to yellow. Maxillary palpi uniformly yellow. Ventral surface including epipleura brown. Femora brown, slightly paler on glabrous distal area. General punctation of elytra moderately impressed, distance between punctures 1–2x width of one puncture. General punctation of head and pronotum similar to that of elytra but slightly more dense. Systematic punctures on elytra similar in size as general punctation, barely detectable.

Head: Maxillary palpi slightly longer than width of head anterior to eyes; apical segment very short, half the length of penultimate segment; penultimate segment moderately thickened apically and with inner surface slightly flattened. Clypeo-labral margin roundly emarginate centrally.

Thorax: Prosternum not carinate, with sparse setae. Mesosternum with a glabrous, broadly obtuse triangular carina forming a small but distinct posteriorly pointing tooth at the apex. Metasternum with elongate oval glabrous area posteromedially, slightly longer than wide; glabrous area slightly half to slightly more than half the total length of the metasternum. Protarsal claws of male with base appearing slightly enlarged although there is no female specimen available for comparison. Hind femora pubescent on basal 3/4. Elytra with sutural stria on posterior 3/4.

Abdomen: Ventrites evenly and densely pubescent. Fifth ventrite with posteromedial emargination, about as wide as deep, appearing near trapezoidal in shape. Aedeagus (Fig. 6) with dorsal strut rising slightly but distinctly above median lobe; parameres narrowed apically.

DIRTRIBUTION: Costa Rica.

ETYMOLOGY: Named in honor of the country from which it is known.

REMARKS: Nothing is known about the habitat of this species.

### ***Enochrus* (*M.*) *debilis* (SHARP)**
(Fig. 13)

*Philydrus debilis* SHARP, 1882: 69.
*Enochrus* (*Lumetus*) *debilis* (SHARP, 1882). – ZAITZEV 1908: 386.
Not *Enochrus* (*Methydrus*) *debilis* (SHARP, 1882). – GUNDERSEN 1978: 31; SHORT 2004a: 353.

TYPE MATERIAL EXAMINED: **Lectotype** (♂), here designated: "Philydrus debilis/Type D. S./ Paso Antonio, 600 ft./ Guatemala, Champion", "Type"[red disc], "Paso Antonio/ 400 ft./ Champion.", "Sharp Coll./ 1905.-313.", "B.C.A. Col. I. 2./ Philydrus/ debilis/ Sharp.", "LECTOTYPE/ Philydrus/ debilis/ Sharp/ A. Short '04" (BMNH). **Paralectotype:** "Philydrus deb-/ilis D. S./ Paso Antonio/ Guatemala", "Paso Antonio/ 400 ft./ Champion.", "B.C.A. Col. I. 2./ Philydrus/ debilis/ Sharp.", "Paralectotype/ Philydrus/ debilis/ Sharp/ A. Short '04" (BMNH).

ADDITIONAL MATERIAL: None seen.

DIFFERENTIAL DIAGNOSIS: Total length 3.0–3.1 mm. Prosternum not carinate. Pronotum not darkened on disc. Mesosternal crest broadly rounded, without crest or posteriorly pointing tooth.

DISTRIBUTION: Guatemala.

REMARKS: The species concept of *E. debilis* sensu GUNDERSEN (1978) is wrong. It was previously shown that *E. debilis* sensu GUNDERSEN (1978) was composite (SHORT 2004a) and is here further shown that neither species included is conspecific with the types. This species is re-described and illustrated (GUNDERSEN 1978) as having a carinate prosternum, a light-colored pronotal disc, and having the bases of the parameres overlapping; the types share none of these features. The species GUNDERSEN (1978) redescribed as *E. debilis* is here described as *E. rivalis*.

### *Enochrus* (*M.*) *metacarina* sp.n.
(Fig. 8)

*Enochrus* (*Methydrus*) *aequalis* (SHARP, 1882). – sensu GUNDERSEN 1977: 264; SPANGLER 1981: 157; SHORT 2004a: 352.

LOCALITY: 10°03'31.0" N, 85°14'25.6", Laguna de Crocodilo, near Carmona, Guanacaste Province, Costa Rica.

TYPE MATERIAL: **Holotype** (♂): "COSTA RICA: Guanacaste Prov./ near Carmona; lag[una]. de crocodilo/ 34m elev; 16.I.2003 A. E. Z. Short/ R. Roughley, W. Porras: HG light/ 10°03'31.0" N, 85°14'25.6" W ", "HOLOTYPE/ Enochrus (M.)/ metacarina/ A. E. Z. Short 2004" (INBio). **Paratypes (31): COSTA RICA: Guanacaste Prov.:** 2 km S Communidad, roadside pools, 16.iv.2003, leg. A.E.Z. Short (4: INBio); near Carmona, laguna de Crocodilo, 34 m, HG-vapor light, 15.i.2003, leg. A.E.Z. Short, W. Porras & R. Roughley (14: AEZS, INBio); 11.5 km W of Cañas, HG-vapor light by ditch, 15 m, 10.i.2004, leg. A.E.Z. Short & D. Lebbin, AS-04-026 (2: INBio); same locality but roadside ditch, 16.vi.2003 (2: INBio); road to Palo Verde National Park, 11.4 km past Route 1, roadside ditch, 35 m, 11.i.2004, leg. A.E.Z. Short & D. Lebbin, AS-04-027 (1: INBio); Palo Verde National Park, margin of lagoon, 25 m, 11.i.2004, leg. A.E.Z. Short & D. Lebbin, AS-04-030 (2: INBio); same locality but HG-vapor light, AS-04-031 (3: AEZS, INBio); Palo Verde National Park, 1.6 km W ranger station, cattle ponds, 12.i.2004, leg. A.E.Z. Short & D. Lebbin, AS-04-032 (2: AEZS, INBio); Palo Verde National Park, 1.9 km past ranger station, stagnant ditch, 12.i.2004, leg. A.E.Z. Short & D. Lebbin, AS-04-033 (1: INBio); 5 mi. SW Liberia, 24.vii.1965, leg. P.J. Spangler (1: USNM). **MEXICO:** Veracruz, 24 mi. E of Coatzocoalcos, 20.viii.1967, leg. H.R. Burke & J. Hafernik (1: TAMU); Veracuz, 4 mi. E of Minatitlan, 11.vi.1965, leg. Burke, Meyer & Schaffner (1: TAMU). **NICARAGUA:** 22 mi. S Rivas, 26.vii.1965, leg. P.J. Spangler (1: USNM); 10 mi. N Rivas, 11.vii.1965, leg. P.J. Spangler (1: USNM). Representative specimens deposited in BMNH, CUIC, NMW, and USNM.

DIFFERENTIAL DIAGNOSIS: Color generally uniformly light to yellowish brown, without a distinctly darkened pronotal disc. Prosternum without carination. The short, low anteromedial metasternal carina and high, thin mesosternal carina is shared only with *E. sharpi.* In addition to the differences in the aedeagus, the latter species can be distinguished by the posterior margin of the mesosternal carina which meets with the metasternum more posteriorly than *E. metacarina*.

DESCRIPTION: Total length 3.0–3.5 mm. Form elongate oval. Moderately convex.

Color & Punctation: Elytra and pronotum uniformly light to yellowish brown, pronotum without any distinct darkening on central disc. Top of head dark brown to black; central third to half of clypeus brown to dark brown, with lateral sides of clypeus light brown to yellow. Maxillary palpi yellow with tip of apical segment slightly but distinctly darkened. Ventral surface including

epipleura and legs dark brown. General punctation on elytra moderately impressed, slightly smaller than the very indistinct irregular systematic punctures; distance between punctures 1–2x the width of one puncture. Pronotum and head with general punctation fine; systematic punctures of head and pronotum present but indistinct.

Head: Antennae nine-segmented. Maxillary palpi with apical segment distinctly shorter than penultimate; segment 2 about 1.2–1.3x length of penultimate segment; total length slightly longer than width of head anterior to eyes. Clypeo-labral margin with distinct broad emargination centrally, exposing a small gap between the clypeus and labrum.

Thorax: Prosternum slightly tectiform centrally, sparsely pubescent; no trace of carination. Mesosternum with a mostly glabrous, thin, longitudinal, elongate, triangular carina, with the apex slightly elevated into a small tooth. Metasternum with low, faint carination on apicomedial quarter, with oval glabrous area posteromedially, 1.5–2.0x as long as wide; glabrous area slightly more than half the total length of metasternum. Protarsal claws of male slightly enlarged at the base. Hind femora pubescent on basal 4/5. Elytra with sutural stria in posterior 3/4.

Abdomen: Ventrites uniformly and densely pubescent. Fifth ventrite with posteromedial emargination, about as wide as deep and lined with coarse yellow setae. Aedeagus (Fig. 7) with dorsal strut rising far above median lobe; parameres evenly narrowed to a rather acute point at apex.

DISTRIBUTION: Costa Rica, Mexico, Nicaragua.

ETYMOLOGY: Metacarina, referring to the fine carination on the anterior portion of the metasternum.

REMARKS: All specimens were collected in shallow, standing water in ditches and lagoons or at lights near such habitats. It was previously confused with *E. aequalis* by some workers (R. Gundersen, P. Spangler) based on examination of material identified by them.

### *Enochrus* (*M.*) *obscurus* (SHARP)

*Philydrus obscurus* SHARP, 1882: 69.
*Enochrus* (*Lumetus*) *obscurus* (SHARP, 1882). – ZAITZEV 1908: 388.
*Enochrus* (*Methydrus*) *obscurus* (SHARP, 1882). – FERNÁNDEZ 1988: 88.

TYPE MATERIAL EXAMINED: **Lectotype** (♀): "Type" [red disc], "Oaxaca, / Mexico,/ Hoege.", "Sharp Coll./ 1905. -313." [label upside down], "Philydrus obscurus/ Type D. S./ Oaxaca. Mexico. Höge.", "B. C. A. Col. I. 2./ Philydrus/ obscurus/ Sharp.", "Syn-Type" [blue disc] (BMNH). A second specimen examined by FERNÁNDEZ (1988) but not designated as a paralectotype is a male with the same locality information, but is missing its head and pronotum.

DIFFERENTIAL DIAGNOSIS: Total length 4.6 mm. The rounded mesosternal carina distinguish *E. obscurus* from all other species except the similar *E. sublongus* and *E. ochraceus*, both of which are smaller in size.

DISTRIBUTION: Ecuador (Galapagos Islands), Mexico, Peru (FERNÁNDEZ 1988).

REMARKS: This species is recorded from both Mexico and South America, but I have seen no Central American specimens.

### *Enochrus* (*M.*) *ochraceus* (MELSHEIMER)

*Philhydrus ochraceus* MELSHEIMER, 1844: 101.
*Philhydrus* (*Helochares*) *lacustris* LECONTE, 1855: 369. – Syn.: FALL 1924: 97.
*Philhydrus simlex* LECONTE, 1863:24. – Syn.: HORN 1873: 129.
*Philydrus ochraceus* MELSHEIMER, 1844. – HORN 1890: 246.

*Enochrus* (*Lumetus*) *ochraceus* (MELSHEIMER, 1844). – ZAITZEV 1908: 388.
*Enochrus* (*Methydrus*) *ochraceus* (MELSHEIMER, 1844). – WINTERS 1927: 20.

MATERIAL EXAMINED: No Central American specimens seen.

DIFFERENTIAL DIAGNOSIS: The rounded mesosternal keel separates this species from all described species in the region except the usually smaller *E. sublongus* and the larger *E. obscurus*. It is further separated from *E. sublongus* by the darker coloration of the epipleura (the same color as the Ventral surface) and the broader notch of the fifth ventrite.

DISTRIBUTION: Widespread in North America, extending into Mexico (HANSEN 1999b).

REMARKS: Central American records (e.g. GUNDERSEN 1978) may refer to another species. See remarks under *Enochrus* (*M.*) sp. A.

### *Enochrus* (*M.*) *pseudochraceus* GUNDERSEN

*Enochrus* (*Methydrus*) *pseudochraceus* GUNDERSEN, 1977: 256.

TYPE MATERIAL: Missing. See comments under *Enochrus*.

MATERIAL EXAMINED (545): **BELIZE:** Cayo District, near Teakettle Bank, Pook's Hill, dates from 6.–9.i.2003, lights, leg. C.R. Bartlett (10: AEZS, UDCC); Belize District, Western Highway near Zoo, 7.i.2003, leg. C.R. Bartlett (2: AEZS). **COSTA RICA: Alajuela Prov.:** 11.5 km NE of Caño Negro, water-filled tire ruts, 14.i.2004, 50 m, leg. A.E.Z. Short & D. Lebbin, AS-04-042 (78: AEZS, INBio); 7 km NE of Caño Negro, wet pasture, 60 m, 11.i.2004, leg. A.E.Z. Short & D. Lebbin, AS-04-041 (51: AEZS, INBio); Caño Negro near research station, margin of lagoon, 14.i.2004, leg. A.E.Z. Short & D. Lebbin, AS-04-044 (6: INBio); Los Lagos-Colonia Road, horse pond, 2780' elev., 11.i.2003, leg. A.E.Z. Short (1: INBio). **Cartago Prov.:** Tapantí National Park, lights by visitor cabin, 6.i.2004, 1280 m, leg. A.E.Z. Short, AS-04-003 (1: INBio). **Guanacaste Prov.:** 2 km S Communidad, roadside pools, 16.iv.2003, leg. A.E.Z. Short (9: INBio); 11.5 km W of Cañas, HG-vapor light by ditch, 15 m, 10.i.2004, leg. A.E.Z. Short & D. Lebbin, AS-04-026 (3: INBio); same locality but roadside ditch, 16.vi.2003 (6: INBio); same locality but HG-vapor light, 16.vi.2003 (1: INBio); road to Palo Verde National Park, 11.4 km after intersection with route 1, ditch, 35 m, 11.i.2004, leg. A.E.Z. Short & D. Lebbin, AS-04-027 (1: INBio); Palo Verde National Park, margin of lagoon, 25 m, 11.i.2004, leg. A.E.Z. Short & D. Lebbin, AS-04-030 (14: INBio); same locality but HG-vapor light, AS-04-031 (4: INBio); Palo Verde National Park, 1.6 km past ranger station, cattle ponds, 12.i.2004, leg. A.E.Z. Short & D. Lebbin, AS-04-032 (6: INBio); Palo Verde National Park, 1.9 km past ranger station, stagnant ditch, 12.i.2004, leg. A.E.Z. Short & D. Lebbin, AS-04-033 (25: INBio); Palo Verde National Park, Palo Verde Station, 10 m, 26.iii.1993, leg. R. U. Chavarría (1: INBio); same locality but 2.x.1999, leg. W. Porras (1: INBio); 5 km NE of Cañas, Río Santa Rosa, creekside pools, 17.vi.2003, leg. A.E.Z. Short (2: INBio); near Carmona, typha cattle pond, 44 m, 15.i.2003, leg. A.E.Z. Short, R. Roughley & W. Porras (20: INBio); near Carmona, laguna de Crocodilo, 34 m, 15.i.2003, leg. A.E.Z. Short, W. Porras & R. Roughley (5: INBio); same locality but 16.i.2003, HG-vapor light (22: INBio); near Carmona, Finca Agua Fria, Río Carmona margin, 15.i.2003, 30 m, leg. A.E.Z. Short, R. Roughley & W. Porras (3: INBio); Barra Honda National Park, 27.xi.2002, leg. W. Shepard & R. Roughley (3: INBio); 12 mi. SW of Liberia, 25.vii.1965, leg. P.J. Spangler (104: USNM). **Heredia Prov.:** Río Sarapiquí E of Highway 4, river margin, 25.vi.2003, leg. A.E.Z. Short (1: INBio). **Limón Prov.:** Marsh by Limón airport, 23.VI.2003, leg. A.E.Z. Short (1: INBio); route 36 between Limón & Cahuita, marshy area near a beach, 24.vi.2003, leg. A.E.Z. Short (27: INBio); near Puerto Viejo, Home Creek, 23.vi.2003, leg. A.E.Z. Short (1: INBio). **Puntarenas Prov.:** Corcovado National Park, La Leona Station, Sendero Río Madrigal, 10.–12.xii.2001, leg. A. Azofeifa, light trap (2: INBio), same locality but 22.–26.xi.2001 (1: INBio); Corcovado National Park, Sirena Station, 0–100 m, v.1992, leg. G. Fonseca (1: INBio); same locality but 17.ii.2001, leg. A. Azofeifa (1: INBio). **GUATEMALA:** 1 mi N Morales, 16.–18.viii.1965, leg. P.J. Spangler (74: USNM, AEZS); 15 mi. W of Pijije, 5.viii.1965, leg. P.J. Spangler (52: USNM). **NICARAGUA:** Matagalpa, km 77.6 PanAm Highway, 4.viii.2002, 1290' elev., roadside pool, leg. W.D. Shepard (4: AEZS); Río San Juan, Refugio Bartola, at lights, 5.–10.viii.2002, leg. W.D. Shepard (1: AEZS). Representative specimens deposited in BMNH, CUIC, EMEC, MALUZ, MCZ, MFC, NMW, and UMC.

DIFFERENTIAL DIAGNOSIS: Total length 2.9–3.8 mm. The low mesosternal crest with a small posterior-pointing tooth and hooked parameres of the aedeagus separate this species from other Middle American *Enochrus*.

DISTRIBUTION: Widespread in Mexico, the West Indies, and into South America (GUNDERSEN 1978, SHORT 2004a, FERNÁNDEZ 1994).

REMARKS: A widespread and often abundant species, *E. pseudochraceus* is the most common species of the genus in Costa Rica. It is found in a variety of habitats but is most abundant in the standing water of marshes, ponds, and roadside ditches and pools.

### *Enochrus* (*M.*) *pygmaeus* (F.)

*Hydrophilus pygmaeus* FABRICIUS, 1792: 186.
*Enochrus* (*Lumetus*) *pygmaeus* (FABRICIUS, 1792). – ZAITZEV 1908: 288.
*Enochrus* (*Methydrus*) *pygmaeus* (FABRICIUS, 1792). – YOUNG 1954: 176.
*Enochrus* (*Methydrus*) *rossi* LEACH, 1948: 451. – Syn.: GUNDERSEN 1977: 257.

MATERIAL EXAMINED (211): **BELIZE:** Belize District: Western Highway near Zoo, light trap in pine grassland, 7.i.2003, leg. C.R. Bartlett (4: AEZS); Cayo District: near Teakettle Bank, Pook's Hill, light trap by river, 6.i.2003, leg. C.R. Bartlett (3: AEZS); same data but swamp at river (1: AEZS); same locality but 5.i.2003 (1: AEZS); same locality but 7.i.2003 (1: AEZS). **COSTA RICA: Alajeula Prov.:** W of Florencia, margin of small river, 200 m, 15.i.2002, leg. A.E.Z. Short & D. Lebbin, AS-04-049 (3: INBio). **Guanacaste Prov.:** 2 km S Communidad, roadside pools, 280' elev., 16.vi.2003, leg. A.E.Z. Short (10: AEZS, INBio); near Carmona, laguna de crocodilo, 35 m, 15.i.2003, leg. A.E.Z. Short, R. Roughely & W. Porras (1: INBio); same locality but 16.I.2003, HG-vapor light (6: INBio); near Carmona, Finca Agua Fria, HG-vapor light on Río Carmona, 26.xi.2002, 30 m, leg. W. Shepard & R. Roughley (7: INBio); Barra Honda National Park, lake at trailhead, 200' elev., 27.xi.2002, leg. W. Shepard & R. Roughley (2: INBio); 11.5 km W of Cañas, roadside ditch, 15 m, 16.VI.2003, leg. A.E.Z. Short (48: AEZS, INBio); same locality but UV light (36: AEZS, INBio); same locality but 10.I.2004, leg. A.E.Z. Short & D. Lebbin, AS-04-026 (19: INBio); Río Seco at Highway 1, N of Cirvelas, pools along river, 17.vi.2003, leg. A.E.Z. Short (12: INBio); Río Guacimal at Highway 1, 400' elev., 17.vi.2003, leg. A.E.Z. Short (1: INBio); 5 km NE of Cañas on Highway 142, Río Santa Rosa, creek side pools, leg. A.E.Z. Short (7: INBio); 19.2 km NW of Monterray, pools along Highway 4, 13.vi.2003, leg. A.E.Z. Short (2: INBio); road to Palo Verde National Park, 11.4 km past Route 1, ditch, 35 m, 11.i.2004, leg. A.E.Z. Short & D. Lebbin, AS-04-027 (25: INBio); road to Palo Verde National Park, 16.5 km W of Route 1, wide ditch, 25 m, 11.i.2004, leg. A.E.Z. Short & D. Lebbin, AS-04-029 (2: INBio); Palo Verde National Park, margin of lagoon, 25 m, 11.i.2004, leg. A.E.Z. Short & D. Lebbin, AS-04-030 (4: INBio). **Heredia Prov.:** Río Sarapiqui margin, just E of Highway 4, 620' elev., 25.vi.2003, leg. A.E.Z. Short (1: INBio). **Limón Prov.:** Near Puerto Viejo, Home Creek margin, 23.vi.2003, leg. A.E.Z. Short (4: INBio); Route 26 between Limón & Cahuita, Marsh near beach, 24.vi.2003, leg. A.E.Z. Short (3: INBio). **Puntarenas Prov.:** near Puerto Jimenez, Río Tigre, UV light, 18.vi.2003, leg. A.E.Z. Short (3: INBio). **NICARAGUA:** Matagalpa, km 77.6 on PanAm Highway, roadside pool, 1290' elev., 4.VIII.2002, leg. W.D. Shepard (5: AEZS). Representative specimens deposited in BMNH, CUIC, EMEC, MALUZ, MCZ, MFC, NMW, UDCC and UMC.

DIFFERENTIAL DIAGNOSIS: Total length 2.4–3.5 mm. Prosternum broadly carinate along entire length. Pronotal disc not distinctly darkened in Central American material. Separated from all other sympatric species by these characters except *E. shepardi*, which is distinctly larger.

DISTRIBUTION: Widespread in North America, Mexico, and the Caribbean (GUNDERSEN 1978, SHORT 2004a); New records for Belize, Costa Rica, and Nicaragua.

REMARKS: This relatively common species is often found in the margins of standing water such as marshes or pools, and less commonly in the margins of streams.

Some authors (e.g. GUNDERSEN 1978) give subspecific rank to different morphological variations within *E. pygmaeus*. However, the exact boundries of this variation (both morphologically and geographically) and how to interpret it is still in question (see SHORT 2004a for additional comments). Until a complete study of the species complex/group can be conducted, assigning subspecific rank cannot be down with confidence.

### *Enochrus* (*M.*) *rivalis* sp.n.
(Fig. 16)

*Enochrus* (*M.*) *debilis* SHARP, 1882. – sensu GUNDERSEN 1967: 183, 1978: 31; SHORT 2004a: 353.

TYPE LOCALITY: Pools in dry creek, Quebrada La Palma, Barra Honda National Park, Guanacaste Province, Costa Rica.

TYPE MATERIAL: **Holotype** (♂): "COSTA RICA: Guanacaste Prov./ Barra Honda N. Park; remnant/ pools in Quebrada La Palma/ 12.I.2004; AS-04-035/ A.E.Z.Short & D.J.Lebbin", "HOLOTYPE/ Enochrus (M.)/ rivalis/ A.E.Z.Short". **Paratypes (251): COSTA RICA: Alajuela Prov.:** 6.1 km N of Los Lagos on Los Lagos-Colonia Rd, pools along Río San Lorenzo, 870 m, 12.i.2003, leg. A.E.Z. Short & R. Roughley (24: AEZS, INBio); same locality but 10.i.2004, leg. A.E.Z. Short & D. Lebbin, AS-04-024 (13: INBio); 3 km SE Los Lagos on San Ramon-Fortuna Road, Río Cataratas, 756 m, 11.i.2003, leg. A.E.Z. Short (6: INBio); 4.1 km N of Los Lagos, stream pools in unnamed creek, 780 m, 10.i.2004, leg. A.E.Z. Short & D. Lebbin, AS-04-025 (9: INBio); W of Florencia, margin of small river, 200 m, 15.i.2004, leg. A.E.Z. Short & D. Lebbin, AS-04-049 (28: AEZS, INBio); Route 126 a few km N of Ujarras, 880 m, pools along creek, 16.i.2004, leg. A.E.Z. Short & D. Lebbin, AS-04-054 (7: INBio); Route 35 38 km SE of Los Chiles, pools/ditch with vegetation by road, 100m, 15.i.2004, leg. A.E.Z. Short & D. Lebbin, AS-04-048 (3: INBio). **Guanacaste Prov.:** Near Carmona, Carmona-Bella Vista Road, stream with pools, 465 m, 16.i.2003, leg. A.E.Z. Short (50: AEZS, INBio); Same data as type (38: AEZS, INBio); same data but HG Vapor light, AS-04-036 (20: AEZS, INBio); Highway 4 at Río Animas, pools along creek margin, 210 m, 14.vi.2003, leg. A.E.Z. Short (4: INBio); same locality but 13.i.2004, leg. A.E.Z. Short & D. Lebbin, AS-04-040 (28: AEZS, INBio); near Carmona, Finca Agua Fria, HG Vapor light on Río Carmona, 26.xi.2002, 30 m, leg. W. Shepard & R. Roughley (2: INBio); route 4 to Upala, near Route 1, 210 m, margins of creek, 13.i.2004, leg. A.E.Z. Short, AS-04-039 (1: INBio); road to Palo Verde National Park, 12.4 km W of Route 1, slow moving stream, 11.i.2004, leg. A.E.Z. Short & D. Lebbin, AS-04-028 (1: INBio); Palo Verde National Park, margin of lagoon, 25 m, 11.i.2004, leg. A.E.Z. Short & D. Lebbin, AS-04-030 (6: INBio). **Limón Prov.:** Puerto Viejo, Home Creek margin, 23.vi.2003, leg. A.E.Z. Short (1: INBio). **HONDURAS:** 10 mi. N. Sabana Grande, 29.vii.1965, leg. P.J. Spangler (4: AEZS, USNM); San Marcus Colon, 28.vii.1965, leg. P.J. Spangler (2: USNM); 10 Mi. W. Choluteca, 29.vii.1965, leg. P.J. Spangler (1: USNM). **NICARAGUA**: Somoto, 28.vii.1965, leg. P.J. Spangler (2: USNM); 10 mi. N. Rivas, 11.vii.1965, leg. P.J. Spangler (1 USNM); Matagalpa, km 77.6 on PanAm Highway, roadside pool, 1290' elev., 4.viii.2002, leg. W.D. Shepard (1: AEZS). Representative specimens deposited in BMNH, CUIC, EMEC, MALUZ, MCZ, MFC, NMW, UMC, and USNM.

DIFFERENTIAL DIAGNOSIS: See diagnosis of *E. aequalis*, which it is most similar.

DESCRIPTION: Total length 2.9–3.5 mm. Form moderately oval.

Color & Punctation: Pronotum and elytra brown to light brown, with pronotal disc distinctly darker. Top of head, central one third of clypeus dark brown; lateral thirds of clypeus light brown to yellow. Maxillary palpi uniformly yellow. Ventral surface including epipleura brown to light brown. Femora brown, slightly paler on glabrous distal area. General punctation of elytra very fine but distinct at 50x magnification, distance between punctures 1–2x width of one puncture. General punctation of head and pronotum slightly more impressed. Systematic punctures on head, pronotum and especially elytra distinct, bearing fine, short setae.

Head: Maxillary palpi longer than width of head anterior to eyes; apical segment 2/3 the length of the penultimate segment. Clypeo-labral margin broadly emarginated centrally.

Thorax. Prosternum with distinct tooth-like carina on anterior 1/3; posterior 2/3 tectiform but without carina or ridge. Mesosternum with broad, moderately elevated, elongate, triangular carina bearing a small tooth at the apex; bearing a few sparse setae on the lateral sides. Metasternum with elongate oval glabrous area posteromedially, slightly longer than wide; glabrous area slightly less than half the total length of the metasternum. Protarsal claws of male with base slightly enlarged. Hind femora pubescent on basal 4/5. Elytra with sutural stria on posterior 3/4.

Abdomen: Ventrites uniformly and densely pubescent. Fifth ventrite with posteromedial emargination, almost as deep as wide and lined with coarse yellow setae. Aedeagus (Fig. 16) with dorsal strut rising above median lobe; basal half of parameres overlapping on ventral face (this feature is not distinct if parameres are pulled apart laterally); apex of parameres evenly narrowed and broadly rounded.

DIRTRIBUTION: Costa Rica, Nicaragua. Likely more widespread based on previous records of *E. debilis* sensu GUNDERSEN (1978).

ETYMOLOGY: *rivalis* (Latin). Named after the common habitat of the species, small stream margins. Used as a noun in apposition.

REMARKS: This species is most often associated with the margins of creeks and streams, in both lowland and cloud forests. On a few occasions it has also been collected in stagnant water.

Very similar to the Caribbean species *E. bartletti* SHORT (see SHORT 2004a); See remarks under *E. debilis*.

### *Enochrus* (*M.*) *sayi* GUNDERSEN

*Enochrus* (*Methydrus*) *sayi* GUNDERSEN, 1977: 262.

TYPE MATERIAL EXAMINED: **Holotype** (♂): "Okeechobee/ 12.vii.1943 Fla./ Wm. Porcter", "Enochrus/ nebulosus Say/ Chamerlain/ Collection", "Type/ Enochrus/ sayi/ R. Gundersen", "HOLOTYPE/ Cornell U./ No. 4425" (CUIC).

ADDITIONAL MATERIAL EXAMINED (22): **BELIZE:** Cayo District, near Teakettle Bank, Pook's Hill, dates from 8.i.2003, lights, leg. C.R. Bartlett (4: AEZS); Belize District, Western Highway near Zoo, 7.i.2003, light trap, leg. C. R. Bartlett (18: AEZS, UDCC, NMW).

DIFFERENTIAL DIAGNOSIS: Total length 3.0–4.2 mm. The fully carinate prosternum, the setiferous, broad, obtusely pointed mesosternal carina, and the dorsal strut rising above the median lobe serve to distinguish this species.

DISTRIBUTION: Eastern North America (GUNDERSEN 1977), Grand Bahama Island (SHORT 2004a), new record for Belize.

REMARKS: Described from eastern North America, the species was recently recorded from Grand Bahama Island (SHORT 2004a). Its range is further extended here in northern Central America. It is not currently recorded from Costa Rica.

### *Enochrus* (*M.*) *sharpi* GUNDERSEN
(Fig. 7)

*Enochrus* (*Methydrus*) *sharpi* GUNDERSEN, 1977: 262.

TYPE MATERIAL: Missing. See above comments under *Enochrus*.

ADDITIONAL MATERIAL EXAMINED (65): **COSTA RICA: Alajuela Prov.:** 7 km NE of Caño Negro, wet pasture, 60 m, 14.i.2001, leg. A.E.Z. Short & D. Lebbin, AS-04-041 (3: AEZS, INBio). **Guanacaste Prov.:** near Carmona, laguna de crocodilo, 34 m, 16.i.2003, HG Vapor light, leg. A.E.Z. Short, R. Roughley & W. Porras (23: INBio); 19.2 km NW of Monterray, pools along Highway 4, 13.vi.2003, leg. A.E.Z. Short (1: INBio); Palo Verde National Park, HG Vapor light by lagoon, 25 m, 11.i.2004, leg. A.E.Z. Short & D. Lebbin, AS-04-031 (1: INBio); Palo Verde National Park, 1.6 km after ranger station, cattle ponds, 12.i.2004, leg. A.E.Z. Short & D. Lebbin, AS-04-032 (1: INBio); Palo Verde National Park, 1.9 km after ranger station, stagnant muddy ditch, 12.i.2004, leg. A.E.Z. Short & D. Lebbin, AS-04-033 (1: INBio); 12 mi. SW Liberia, 25.vii.1965, leg. P.J. Spangler (2: USNM); 10 mi. NW Liberia, leg. P.J. Spangler (2: USNM); 7 mi. NW Liberia, 13.vii.1965, leg. P.J. Spangler (1: USNM). **Puntarenas Prov.:** Puntarenas, 22.vii.1965, leg. P.J. Spangler (1: USNM). **MEXICO:** Colima, 2 mi. NW Manzanillo, Bahia de Manzanillo, 5.i.1972, leg. R.R. & M.E. Murry, ME-48 (6: TAMU); Tabasco, 15 mi. NE Villahermosa, 13.vi.1965, leg. H.R. Burke, J.R. Meyer & J.C. Schaffner (1: TAMU); Veracuz, 4 mi. E of Minatitlan, 11.vi.1965, leg. Burke, Meyer & Schaffner (5: TAMU). **NICARAGUA:** Somoto, 28.vii.1965, leg. P.J. Spangler (13: USNM); La Trinidad, 27.vii.1965, leg. P.J. Spangler (1: USNM); 6 mi. N Managua, vii.27.1965, leg. P.J. Spangler (2: USNM); 22 mi. S Rivas, 26.vii.1965, leg. P.J. Spangler (1: USNM). Representative specimens deposited in BMNH, CUIC, EMEC, MALUZ, MCZ, MFC, and NMW.

DIFFERENTIAL DIAGNOSIS: Total length 3.2–4.2 mm. See diagnosis of the similar *E. metacarina*.

DISTRIBUTION: Costa Rica, Mexico, Nicaragua.

REMARKS: In Costa Rica, this species was encountered in grassy or detritus filled pools and other stagnant water, mostly at low elevations.

### *Enochrus* (*M.*) *shepardi* sp.n.
(Fig. 11)

TYPE LOCALITY: Río Cimmarones at Cimmarones, Cartago Province, Costa Rica.

TYPE MATERIAL: **Holotype** (♂): "COSTA RICA: Cartago/ Cimmarones at Rio Cimmarones, 23-XI-2002/ black lights; W. Shepard" (INBio). **Paratypes (56): COSTA RICA: Alajuela Prov.:** 11.2 km SE of San Rafael on Highway 4, stream in rock slot, 550' elev., 13.vi.2003, leg. A.E.Z. Short (1: INBio). **Cartago Prov.:** same data as holotype (3: AEZS, INBio); Turrialba, Barbilla National Park, Río Danta, 500–600 m, 11.x.2001, leg. W. Arana (1: INBio 1); same locality but at light (1: INBio). **Guanacaste Prov.:** Highway 1 at Río Guacimal, 400' elev., 17.vi.2003, leg. A. Short (3: INBio). **Heredia Prov.:** Río Sarapiqui margin, just E of Highway 4, 620' elev., 25.vi.2003, leg. A. Short (31: AEZS, INBio). **Limón Prov.:** Amubri, La Amistad, 70 m, 8.–30.iii.1994, leg. G. Gallardo (1: INBio); Hitoy Cerere Biological Reserve, leg. W. Arana, various dates (15: INBio). Representative specimens deposited in BMNH, CUIC, EMEC, MALUZ, MCZ, and NMW.

DIFFERENTIAL DIAGNOSIS: The combination of a high prosternal carina, a large glabrous mesosternal carina, and dorsal strut that extends past the median lobe help to distinguish this species. It is most similar to *E. pygmaeus* but that species is smaller and has a noticeably narrower mesosternal carina.

DESCRIPTION: Total length 4.0–4.8 mm. Form elongate to broadly oval; convex.

Color & Punctation: Elytra brown to light brown, slightly paler along lateral margins. Pronotum uniformly light brown to yellow, distinctly paler than elytra. Top of head dark brown to black, with clypeus and labrum yellow. Maxillary palpi uniformly yellow. Ventral surface including epipleura dark brown; mesosternum sometimes slightly paler. Femora dark brown, slightly paler distally. General punctation on elytra extremely fine, almost not detectable at 50X magnification. Four irregular rows of systematic punctures present with some bearing a fine, short seta. Pronotum and head with general punctation fine but more distinct than elytra.

Head: Maxillary palpi slightly shorter to subequal to the width of the head anterior to the eyes; apical segment about 2/3 the length of the penultimate segment. Clypeo-labral margin with distinct, moderately broad emargination centrally.

Thorax: Prosternum distinctly carinate along entire length, with anterior third more strongly elevated into a distinct tooth. Mesosternum with a glabrous, longitudinal, elongate, high triangular carina, with the apex slightly elevated into a small tooth. Metasternum with elongate oval glabrous area posteromedially, about three times longer than wide; glabrous area slightly more than half the total length of the metasternum. Protarsal claws of male slightly enlarged at the base. Hind femora pubescent on basal 4/5. Elytra with sutural stria in posterior 3/4.

Abdomen: Ventrites uniformly and densely pubescent. Fifth ventrite with posteromedial emargination, distinctly wider than deep and lined with coarse yellow setae. Aedeagus (Fig. 11) with dorsal strut rising distinctly above median lobe; parameres tapered to a point on posterior half.

DISTRIBUTION: Costa Rica.

ETYMOLOGY: Named in honor of aquatic Coleopterist William D. Shepard who first approached me about working on the Costa Rican water beetle project and with whom I have enjoyed several productive collecting trips.

REMARKS: Most of the specimens collected were taken along the margins of streams and rivers. At one locality (Río Sarapiquí, Costa Rica) they were very common among emergent grasses and cobbles on the margins of the river. This species has also been taken at lights.

### *Enochrus* (*M.*) *sublongus* (FALL)

*Philhydrus elongatulus* FALL, 1924: 85.
*Philhydrus sublongus* FALL, 1926: 125 (replacement name for *P. elongatulus*).
*Enochrus* (*Methydrus*) *sublongus* (FALL, 1926). – WINTERS 1927: 20.

MATERIAL EXAMINED: No confirmed specimens from Central America examined.

DIFFERENTIAL DIAGNOSIS: Total length 2.3–2.7 mm. In North American material, this species can be distinguished from the similar *E. ochraceus* by the lighter coloration of the epipleura, the narrower notch of the fifth ventrite, and the usually smaller size.

DISTRIBUTION: Eastern United States (GUNDERSEN 1978); also recorded from Guatemala, Argentina, and Paraguay (FERNÁNDEZ 1988).

REMARKS: Previous Central American records may refer to another species. See remarks under *Enochrus* sp. A.

### *Enochrus* (*M.*) *torito* sp.n.
(Fig. 15)

TYPE LOCALITY: 10°13.729' N, 84°34.249' W, Río San Lorenzo, 6.4 km W Los Lagos, Alajuela Province, Costa Rica.

TYPE MATERIAL: **Holotype** (♂): "COSTA RICA: Alajuela Prov./ Rio San Lorenzo; 6.4 km from/ Los Lagos; 740m elv; stream/ margin AEZ Short & DJ Lebbin/ AS-04-024; 10.I.2004", "HOLOTYPE/ Enochrus (M.)/ torito" (INBio). **Paratypes (54): COSTA RICA: Alajuela Prov.:** same data as type (21: AEZS, INBio); same locality but 12.i.2003, leg. A.E.Z. Short & R. Roughley (6: INBio); creek 4.1 km W Los Lagos, 10.i.2004, stream pools, leg. A.E.Z. Short & D.J. Lebbin, AS-04-024 (5: INBio); Highway 4, 11.2 km SE of San Rafael, stream in rock slot, 550' elev., 13.vi.2003, leg. A.E.Z. Short (8: INBio); Río Cataratas, 3 km SE Los Lagos on San Ramon-Fortuna Road, 756' elev., 11.i.2003, leg. A.E.Z. Short (1: INBio); 3.7 km N of Catarata del Toro, pools along creek, 1020 m, 16.i.2004, leg. A.E.Z. Short & D.J. Lebbin, AS-04-033 (1: INBio). **Guanacaste Prov.:** Barra Honda National Park, pools in Quebrada La Palma, 12.i.2004, leg. A.E.Z. Short & D.J. Lebbin, AS-04-035 (1: INBio); same locality but HG-vapor light, AS-04-036 (2: INBio); Barra Honda National Park, Las Cascadas stream, 200' elev., 27.xi.2002, leg. R.E. Roughley & W.D. Shepard (7: INBio); Palo Verde National Park, HG-vapor light by lagoon, 25 m, 11.i.2004, leg. A.E.Z. Short & D.J. Lebbin, AS-04-031 (2: INBio). Representative specimens deposited in BMNH, CUIC, EMEC, MALUZ, MCZ, MFC, NMW, and USNM.

DIFFERENTIAL DIAGNOSIS: Generally most similar to and found in related habitats as *E. rivalis*, but easily distinguished by the dorsal strut not extending above the median lobe. This feature is shared with *E. toro*, *E. aequalis*, and *E. metacarina* but all these species are generally larger, and the latter lacks a prosternal carina.

DESCRIPTION: Total length 2.6–3.2 mm. Form moderately to broadly oval; moderately convex.

Color & Punctation: Elytra brown to light brown, slightly paler along lateral margins. Pronotum dark brown on central disc and light brown to yellow and lateral thirds. Top of head brown and central third to half of clypeus brown to dark brown, with lateral sides of clypeus light brown to yellow. Maxillary palpi uniformly yellow. Ventral surface dark brown; epipleura sometimes distinctly slightly paler. Femora dark brown, with distal glabrous portion and tibia paler. General punctation on elytra moderately to finely impressed, slightly smaller than irregular systematic punctures with the latter difficult to detect; distance between punctures 1–2x the width of one

puncture. Pronotum and head with general punctation fine but more distinct than elytra; systematic punctures of head and pronotum present but indistinct.

Head: Antennae nine-segmented. Maxillary palpi slightly shorter than the width of the head anterior to the eyes; apical segment slightly but distinctly shorter than penultimate segment; segment 2 about 1.5 times longer than penultimate segment. Segment 2 very slightly flattened on inner face, with penultimate segment slightly enlarged; this character state is more accentuated in males. Clypeo-labral margin with distinct broad emargination centrally, exposing a small gap between the clypeus and labrum.

Thorax: Prosternum tectiform centrally, with anterior third carinate and elevated into a small tooth. Mesosternum with a mostly glabrous, longitudinal, elongate, triangular carina, with the apex slightly elevated into a small tooth. Metasternum with oval glabrous area posteromedially, about as long as wide; glabrous area slightly less than half the total length of the metasternum. Protarsal claws of male not distinctly enlarged at the base. Hind femora pubescent on basal 4/5. Elytra with sutural stria in posterior 3/4.

Abdomen: Ventrites uniformly and densely pubescent. Fifth ventrite with posteromedial emargination, very slightly wider than deep and lined with coarse yellow setae. Aedeagus (Fig. 15) with dorsal strut not rising above median lobe; inner margins of parameres closely adjoining each other (but not overlapping) in basal half; apex of parameres broadly rounded.

DISTRIBUTION: Costa Rica.

ETYMOLOGY: Torito, the diminutive of 'bull' in Spanish, in reference to the similarities this species shares with *E. toro*, but that it is smaller in size.

REMARKS: This is primarily a lotic species, with most collections along stream margins or the residual pools of drying streams.

### *Enochrus* (*M.*) *toro* sp.n.
(Fig. 10)

TYPE LOCALITY: 10°15.252' N, 84°16.285' W, Catarata del Toro, 7 km N Bajos del Toro, Alajuela Province, Costa Rica.

TYPE MATERIAL: **Holotype** (♂): "COSTA RICA: Alajuela Prov./ 7 km N. Bajos del Toro; Catarata/ del Toro, on seeps, 1210[m] elev./ 15.I.2004; AS-04-052; on seeps/ A.E.Z. Short & D.J. Lebbin", "HOLOTYPE/ Enochrus (M.)/ toro/ A. E. Z. Short 2004" (INBio). **Paratypes (41): COSTA RICA: Alajuela Prov.:** same data as type (30: AEZS, INBio); 5 km S Bajos del Toro, 2040 m, 15.i.2004, leg. A.E.Z. Short & D.J. Lebbin, AS-04-050 (1: AEZS). **Cartago Prov.:** Tapantí National Park, 4.9 km past entrance gate, pools in shallow ditch, leg. A.E.Z. Short, AS-04-017 (1: AEZS); Tapantí National Park, pools along entrance road, 22.vi.2003, leg. A.E.Z. Short (1: INBio). **Puntarenas Prov.:** Coto Brus, Pittier Station, leg. R. González, various dates (8: INBio). Representative specimens deposited in BMNH, CUIC, MALUZ, MFC, NMW, and USNM.

DIFFERENTIAL DIAGNOSIS: See diagnosis of *E. aequalis*, with which it is most similar.

DESCRIPTION: Total length 3.2–3.9 mm. Form broadly oval; convex.

Color & Punctation: Elytra brown to light brown, becoming slightly paler along lateral margins. Pronotum dark brown on central disc and light brown to yellow and lateral thirds. Top of head brown and central third to half of clypeus brown to dark brown, with lateral sides of clypeus light brown to yellow. Maxillary palpi uniformly yellow. Most of ventral surface dark brown; epipleura slightly to distinctly paler. Femora dark brown, with distal glabrous portion; tibia paler. General punctation on elytra moderately to finely impressed, slightly smaller than irregular systematic punctures with the latter difficult to detect; distance between punctures 1–2x the width of one puncture. The two specimens from Tapantí National Park have noticeably finer

general punctation than those from the type locality. Pronotum and head with general punctation fine but more distinct than elytra; systematic punctures of head and pronotum present but indistinct.

Head: Antennae nine-segmented. Maxillary palpi slightly shorter than the width of the head anterior to the eyes; apical segment slightly but distinctly shorter than penultimate segment; segment 2 about 1.5 times longer than penultimate segment. Segment 2 slightly flattened on inner face, with penultimate segment slightly enlarged; this character state is more accentuated in males. Clypeo-labral margin with distinct broad emargination centrally, exposing a small gap between the clypeus and labrum.

Thorax: Prosternum tectiform centrally, with anterior third carinate and elevated into a small tooth. Mesosternum with a mostly glabrous, longitudinal, elongate, triangular carina, with the apex slightly elevated into a small tooth. Metasternum with oval glabrous area posteromedially, about as long as wide; glabrous area slightly less than half the total length of the metasternum. Protarsal claws of male slightly enlarged at the base. Hind femora pubescent on basal 4/5. Elytra with sutural stria in posterior 3/4.

Abdomen: Ventrites uniformly and densely pubescent. Fifth ventrite with posteromedial emargination, slightly wider than deep and lined with coarse yellow setae. Aedeagus (Fig. 10) with dorsal strut not rising above median lobe; inner margins of parameres closely adjoining each other (but not overlapping) in basal half; apex of parameres evenly tapered to a moderately fine tip.

DISTRIBUTION: Costa Rica.

ETYMOLOGY: Named after the type locality, Catarata del Toro; toro translates to 'bull' in English.

REMARKS: Apparently associated with higher elevation wet forests; all collections were above 1000 m elevation. The longer series from the type locality was collected on wet boulders and seepages at the base of the Catarata del Toro with specimens of the hygropetric genus *Oocyclus* SHARP (for a photograph of the type locality, see SHORT & PERKINS 2004: 44). Most specimens were in algae that were present on the rocks. The other three collections were made in small pools formed by water running off rock seeps along road-cuts.

### *Enochrus* (*M.*) sp. A
(Fig. 14)

MATERIAL EXAMINED: **COSTA RICA: Alajuela Prov.:** 11.5 km NE of Caño Negro, water-filled tire ruts, 14.i.2004, 50 m, leg. A.E.Z. Short & D. Lebbin, AS-04-042 (1: INBio); 7 km NE of Caño Negro, wet pasture, 60 m, 11.i.2004, AS-04-041 (1: INBio); Caño Negro near research station, margin of lagoon, 14.I.2004, leg. A.E.Z. Short & D. Lebbin, AS-04-044 (4: INBio); same locality but 15.i.2004, AS-04-047 (2: INBio); Caño Negro, HG-vapor light at boat dock, 14.i.2004, leg. A.E.Z. Short, AS-04-045 (1: INBio). **Guanacaste Prov.:** near Carmona, HG-vapor light at laguna de crocodila, 34 m, 16.i.2003, leg. A.E.Z. Short, R. Roughley & W. Porras (13: INBio); typha pond near Carmona, 44 m, 15.i.2003; leg. A Short, R. Roughley & W. Porras (12: INBio); Palo Verde National Park, margin of lagoon, 25 m, 11.i.2004, leg. A.E.Z. Short & D. Lebbin, AS-04-030 (4: INBio); same locality but HG-vapor light, AS-04-031 (7: INBio); Palo Verde National Park, 1.6 km past ranger station, cattle ponds, 12.i.2004, leg. A.E.Z. Short & D. Lebbin, AS-04-032 (7: INBio); Palo Verde National Park, 1.9 km past ranger station, stagnant ditch, 12.i.2004, leg. A.E.Z. Short & D. Lebbin, AS-04-033 (3: INBio); Barra Honda National Park, HG-vapor light by Quebrada La Palma, 12.i.2004, leg. A.E.Z. Short & D.J. Lebbin, AS-04-036 (1: INBio). **NICARAGUA:** Matagalpa, km 77.6 of PanAm Highway, 1290' elev., roadside pool, 4.viii.2002, leg. W.D. Shepard (2: AEZS); Río San Juan, Refugio Bartola, 5.–10.viii.2002, at lights, leg. W.D. Shepard (2: AEZS).

REMARKS: Of *Methydrus* species with low and rounded mesosternal crests, three are recorded from Central America or with ranges that straddle it. *Enochrus obscurus* is a larger species (more

than 4.0 mm) that has been recorded from Mexico and South America, but not yet known from Central America. Two species first described from the North America, *E. sublongus* and *E. ochraceus* have both subsequently been recorded from Central America, with the former being recorded as far south as Argentina (FERNÁNDEZ 1988). GUNDERSEN (1978) separates these two species largely on the basis of color, size, and the shape of the notch on the fifth ventrite. These differences are quite sufficient to separate material from North America. The specimens referred here to *Enochrus* sp. A are similar in size and dorsal coloration to *E. sublongus*, but differ in that the color of the epipleura is generally darkened, and in differences in the shape of the dorsal strut (usually tapered to an acute point in *E. sublongus*, but not in *E.* sp. A). FERNÁNDEZ (1988) illustrates a Guatemalan '*E. sublongus*' as having a slight bulge at the tip of the dorsal strut and uses this as the primary character to separate it from *E. venezuelensis* FERNÁNDEZ. However, specimens from North America I have seen do not have this feature. It is likely all these taxa represent a species complex. Because I have seen limited material from Mexico and South America of these taxa I am unable to assess the extent of geographic or interspecific variation. I am not assigning a new or existing name to this material.

Nearly all specimens of *E.* sp. A were collected in standing water such as ditches, lagoons, and cattle ponds; it is also attracted to lights.

## Genus *Helobata* BERGROTH

*Helopeltis* HORN, 1873: 137 (not SIGNORET, 1858).
*Helobata* BERGROTH, 1888: 221 (replacement name for *Helopeltis* HORN, 1873).
*Helopeltina* COCKERALL, 1906: 240.

*Helobata* contains nine species, almost exclusively restricted to the Neotropical region (HANSEN 1999b, GARCÍA 2000b). One widespread species, *Helobata larvalis* (HORN) occurs from the southern United States through Central America and the West Indies (HANSEN 1999b). This species is recorded here for the first time from Costa Rica.

### *Helobata larvalis* (HORN)

*Hydrophilus* (*Philydrus*) *striatus* BRULLÉ, 1841:58.
*Philhydrus striatus* (BRULLÉ, 1841). – LACORDAIRE 1854: 457.
*Helopeltis striatus* (BRULLÉ, 1841). – BEDEL 1881: XCIV.
*Enochrus* (*Lumetus*) *striatus* (BRULLÉ, 1841). – ZAITZEV 1908: 389.
*Helobata striata* (BRULLÉ, 1841). – KNISCH 1924: 223.
*Helopeltis larvalis* HORN, 1873: 137.

MATERIAL EXAMINED (17): **COSTA RICA: Alajuela Prov.:** Caño Negro National Wildlife Refuge, 20 m, 29.xii.1994–24.I.1995, leg. F. Flores (1: INBio). **Guanacaste Prov.:** Typha pond near Carmona, 44 m, 15.i.2003, leg. A Short, R. Roughley & W. Porras (5: AEZS, INBio, NMW); "Finca Agua Fria" near Carmona, HG-vapor light at Río Carmona, 26.xi.2002, 30 m, leg. W. Shepard & R. Roughley (1: INBio); Palo Verde National Park, 1.9 km past ranger station, stagnant ditch, 12.i.2004, leg. A.E.Z. Short & D. Lebbin, AS-04-033 (1: INBio); Guanacaste National Park, Finca Jenny, 30 km N Liberia, x.1989, leg. E. Araya & R. Espinoza (1: INBio), same locality but 8.–12.xii.1993 (1: INBio); Guanacaste National Park, Los Almendros, 300 m, 8.–20.xi.1993, leg. E. Lopez (1: INBio); "A.C.T. Santa Cruz", Diriá National Forest, Bosque Diriá Station, 150–250 m, 26.–27.xi.1998, leg. J. Matarrita (1: INBio); Murciélago, 8 km SW of Cuajiniquil, 100 m, 11.–20.xi.1993, leg. F. Quesada (2: INBio). **Puntarenas Prov.:** Osa Peninsula, Rancho Quemado, 200 m, 6.–22.XII.1993, leg. A.H. Gutiérrez (1: INBio); Osa Peninsula, Esquinas Station, 200 m, 13.–29.xii.1992, leg. A.H. Gutiérrez (2: INBio).

DIFFERENTIAL DIAGNOSIS: Total length 5.2–6.5 mm. The broadly explanate margins of the pronotum, elytra and clypeus make this species unmistakable in the Central American fauna.

DISTRIBUTION: Widespread in the Neotropical region north to the Gulf Coast of the United States (HANSEN 1999b); new record for Costa Rica.

REMARKS: This species is generally collected in shallow stagnant water with lots of detritus or vegetation. In Costa Rica, it was found only in lowland areas. When collected, it has not been abundant but rather only a few specimens were taken at each site. It has also been collected at lights.

## Genus *Helochares* MULSANT

*Enhydrus* DAHL, 1823: 34 (nom. nud).
*Helochares* MULSANT, 1844: 197.

The three subgenera present in Central America, *Hydrobaticus* MACLEAY, *Sindolus* SHARP, and *Helochares* s.str., are each represented by multiple species. The subgenera are very distinct, but the species within each subgenus are extremely similar. Fortunately, the male genitalia are usually very diagnostic and easily characterize each species. Due to intraspecific variation and homogeneity in many characters, it is strongly recommended that identifications be confirmed with examination of the aedeagus when possible.

### Key to the species of *Helochares* of Central America

1 Mesosternum with high longitudinal, laminar keel. Usually less than 4.5 mm (subgenus *Sindolus* SHARP). ..... 2

– Mesosternum without high laminar keel, at most with low longitudinal or transverse ridge..... 3

2 Antennal cupule distinctly wider than first segment of club, elongate oval; general punctation on elytra extremely fine, almost undetectable ..... ***mundus* (SHARP)**

– Antennal cupule not as wide as first segment of club; general punctation of elytra fine but distinct and easily distinguishable ..... ***optatus* (SHARP)**

3 Elytra with distinct serial punctures or punctate stria (except *H. championi*); pronotum with distinct dark patch positioned posterocentrally, usually less than half the size of pronotum. Aedeagus narrow with nearly straight and parallel outer margins, median lobe distinctly rising above parameres (e.g. Fig. 21) (Subgenus *Hydrobaticus*)..... 4

– Elytra without elytral stria or serial punctures; pronotum generally uniform in color except for occasional pale lateral margins. Aedeagus not narrow with nearly straight and parallel outer margins as above, median process never rising above parameres (subgenus *Helochares* s.str.)..... 6

4 Elytra with distinct serial puctures or punctate stria..... 5

– Elytra without serial puctures or stria..... ***championi* SHARP**

5 Elytra with distinct, individual serial punctures; not forming strial grooves... ***normatus* (LECONTE)**

– Elytra with serial punctures placed in shallow but distinct strial grooves..... ***maculicollis* MULSANT**

6 Apex of parameres with distinct tooth on outer margin (Figs. 17, 20). General punctation of elytra absent or apparently absent at 50x magnification. Dorsal coloration dark brown to yellowish brown, with lateral margins of pronotum and elytra sometimes slightly paler, but without a clearly defined border..... 8

– Parameres not as above (Figs. 18–19). General punctation on elytra fine but distinct at least on disc. Dorsal coloration brown to appearing almost black. Elytra with or without a clearly defined pale border..... 7

7 Aedeagus as in Fig. 19, with parameres overlapping centrally on dorsal face. General punctation of elytra moderately fine but distinct throughout. Dorsum brown to dark brown,

with pale lateral margins of elytra and pronotum sharp and clearly defined. In males, pubescence on ventrites generally uniform in density ..... ***sallaei* SHARP**

– Aedeagus as in Fig. 18, with parameres not overlapping centrally. General punctation of elytra very fine and detectable on disc, but becoming finer laterally and usually undetectable. Dorsum dark brown to almost black with indistinct, slightly paler margins. In males, pubescence on ventrites twice as dense in the center of the ventrite as lateral portions ***carmona* sp.n.**

8 Aedeagus with apex of dorsal strut bulbous, with two short projections (Fig. 17). Dorsal coloration usually darker, brown to dark brown..... ***abbreviatus* (F.)**

Aedeagus with apex of doral strut with two prolonged projections, which on ventral surface appear fork-like (Fig. 20). Dorsal coloration usually paler, light to yellowish brown ***oculatus* SHARP**

## Subgenus *Helochares* s.str.

### *Helochares* (s.str.) *abbreviatus* (F., 1801)
(Fig. 17)

*Hydrophilus abbreviatus* FABRICIUS, 1801: 251.
*Helochares* (s.str.) *abbreviatus* (FABRICIUS, 1801). – d'ORCHYMONT 1936: 10.
*Philydrus pallidus* CASTELNAU, 1840: 53. – Syn.: d'ORCHYMONT 1936: 10.
*Helochares* (*Hydrobaticus*) *rufobrunneus* BALFOUR-BROWNE, 1939: 293. – Syn.: SPANGLER 1981: 158.

MATERIAL EXAMINED (25): **COSTA RICA: Alajuela Prov.:** 11.5 km NE of Caño Negro, water-filled tire ruts, 14.i.2004, 50 m, A. Short & D. Lebbin, AS-04-042 (1: INBio); Caño Negro, HG light on dock, 14.i.2004, leg. A.E.Z. Short & D. Lebbin, AS-04-045 (1: INBio). **Guanacaste Prov.:** near Carmona, HG-vapor light at laguna de Crocodilo, 34 m, 16.i.2003, leg. A.E.Z. Short, R. Roughley & W. Porras (14: AEZS, INBio); near Carmona, cattle pond, 44 m, 15.i.2003, leg. A.E.Z. Short, R. Roughley & W. Porras (1: AEZS); Palo Verde National Park, margin of lagoon, 25 m, 11.i.2004, leg. A.E.Z. Short & D. Lebbin, AS-04-030 (1: INBio); Palo Verde National Park, 1.9 km past ranger station, stagnant ditch, 12.i.2004, leg. A.E.Z. Short & D. Lebbin, AS-04-033 (2: AEZS, INBio); Palo Verde National Park, 8.vi.2000, "shaded tank at spring", leg. R.E. Roughley, CR-00-10 (1: INBio); Guanacaste National Park, blacklight at Pocosol Station, 14.vi.2003, leg. A.E.Z. Short (1: INBio); Guanacaste National Park, Finca Jenny, 240 m, 2.–6.x.1994, leg. E. Araya (1: INBio); Barra Honda National Park, Sendero Los Mesones, 100 m, ii.1994, leg. M. Reyes (1: INBio). **Puntarenas Prov.:** Puente Río Rincón, 0–100 m, 25.vi.2001, light trap, leg. R. González (1: INBio). Representative specimens deposited in EMEC and NMW.

DIFFERENTIAL DIAGNOSIS: Total length 5.6–6.6 mm.

DISTRIBUTION: Broadly distributed, recorded from Costa Rica, Panama, West Indies (Cuba, Lesser Antilles), and South America (Argentina, Bolivia, Brazil, Colombia, French Guayana, Paraguay, Surinam, Venezuela); (HANSEN 1999b)

REMARKS: This widely distributed Neotropical species is found in lentic habitats, including marshes, swamps, and pond margins.

### *Helochares* (s.str.) *carmona* sp.n.
(Fig. 18)

TYPE LOCALITY: 10°03'31.0" N, 85°14'25.6", Laguna de Crocodilo, near Carmona, Guanacaste Province, Costa Rica.

TYPE MATERIAL: **Holotype** (♂): "COSTA RICA: Guanacaste Prv./ near Carmona; lag. de crocodilo/ 34m elev; 16-I-2003 A.E.Z. Short/ R. Roughley, W. Porras: HG Light/ 10°03'31.0"N 85°14'25.6"W", "HOLOTYPE/ Helochares (s.str.)/ carmona/ A. E. Z. Short" (INBio). **Paratypes (5):** Same data as holotype (5: AEZS, INBio, NMW).

ADDITIONAL MATERIAL EXAMINED (2): **COSTA RICA: Alajuela Prov.:** Caño Negro Wildlife Refuge, 20 m, 6.–28.vi.1994, leg. K. Flores (INBio 1). **Guanacaste Prov.:** Guanacaste National Park, Pitilla Station, 9 km S

Station Cecilia, 700 m, 8.–24.viii.1991, leg. C. Moraga (INBio 1). These two specimens were not designated as paratypes because of their condition; the second specimen is missing its abdomen.

DIFFERENTIAL DIAGNOSIS: Among species in the subgenus, *H. carmona* is distinguishable by the following features: the distinct dorsal punctation on the elytral disc is becoming nearly absent laterally; the males have a central dense patch of setae on ventrites 2–5, and distinctive genitalia (Fig. 18). Most similar in color to *H. sallaei* but slightly darker and with the above differences.

DESCRIPTION: Total length 5.4–6.6 mm. Form broadly elongate oval; widest point of elytra present in posterior half; slightly convex.

Color & Punctation: Head dark brown with lateral margins of clypeus slightly paler in some specimens; pronotum and elytra dark brown, becoming distinctly paler laterally, paler margins not sharply defined. Maxillary palpi dark brown with apical tip of each segment distinctly paler. Ventral surface uniformly dark brown, with epipleura and glabrous tips of femora slightly paler. General punctation of elytra moderately fine but distinct apico-centrally, but becoming progressively more fine and diffuse posteriorly and laterally until appearing absent at margins; general punctation of head and pronotum similar to punctation on elytral disc, not becoming substantially finer laterally. Systematic punctures on head, pronotum and elytra present; those on elytra fairly distinct, especially laterally where general punctation is absent; bearing short, fine, setae.

Head: Antennae nine-segmented. Maxillary palpi 1.5x as long as width of the head anterior to the eyes; apical segment shorter than penultimate, segment 2 slightly longer than penultimate. Anterior margin of clypeus sinuate but not exposing a small gap between the clypeus and labrum.

Thorax: Prosternum highly tectiform centrally but without carination; densely pubescent. Mesosternum with a low, rounded tuberance but without tooth, lateral ridge, or distinct carina; bearing long, fine setae. Metasternum with a very narrow glabrous strip posteromedially, about 2/3 the total length of the metasternum. Hind femora pubescent on basal 4/5. Elytra without sutural stria; general surface appearing smooth but uneven under high magnification.

Abdomen: Ventrites densely pubescent; in males, medial portion of ventrites 2–5 with pubescence more than twice as dense and setae distinctly longer than surrounding pubescence. Aedeagus (Fig. 18) with parameres not overlapping dorsally, narrowing apically to an acute point; median process distinctly bifid apically, not reaching above parameres.

DISTRIBUTION: Costa Rica.

REMARKS: Nothing is known about the specific habitat of this species. The type series was collected at a mercury vapor light by a drying, lowland marsh.

### *Helochares* (s.str.) *oculatus* (SHARP)
(Fig. 20)

*Helochares oculatus* SHARP, 1882: 74.

TYPE MATERIAL EXAMINED: **Lectotype** (♂): (Dissected and mounted on card) “Helochares ocu-/latus D. S./ Paso Antonio 400/ ft. Guatemala” (on original card), “Paso Antonio,/ 400 ft/ Champion”, “B. C. A. Col. I. 2./ Helochares/ oculatus/ Sharp”, “Lecto-Type” [purple disc], “Lectotypus [male symbol]/ Helochares (H.)/ oculatus Sharp/ det. Fernández” (BNMN).

ADDITIONAL MATERIAL EXAMINED (2): **COSTA RICA: Cartago Prov.:** Barbilla National Park, Barbilla Station, Turrialba, 600 m, 19.x.2000, leg. W. Arana (1: AEZS). **Puntarenas Prov.:** Rancho Quemado, Osa Peninsula, 200 m, 19.–27.viii.1993, leg. A. Gutiérrez (1: INBio).

DIFFERENTIAL DIAGNOSIS: Total length 7.2 mm. Exceedingly similar to *H. abbreviatus* from which it can only consistently and discretely be distinguished by the central strut of the aedeagus being distinctly forked apically, with the two projections elevated on dorsal surface into ridges. The dorsal coloration is generally more uniform and slightly darker brown than in *H. abbreviatus*, but this is a highly variable character which cannot be confidently observed without comparative material.

DISTRIBUTION: Argentina, Brazil, Guatemala, Panama (HANSEN 1999b); new record for Costa Rica.

REMARKS: Nothing is known about the habitat of this species.

### *Helochares* (s.str.) *sallaei* (SHARP)
(Fig. 19)

*Helochares sallaei* SHARP, 1882: 75.
*Philydrus estriatus* BLATCHLEY, 1919: 139. – Syn.: WINTERS 1927: 24.
*Enochrus* (*Lumetus*) *estriatus* (BLATCHLEY, 1919). – KNISCH, 1924: 208.

TYPE MATERIAL EXAMINED: **Holotype** (♀) by monotypy: "Helochares sallaei/ type D. S./ Cordova, Mexico, /Sallaé" [on card with specimen], "Holo-type" [red disc], "Cordova", "Mexico/ Sallé. Coll.", "881" [upsidedown], "B.C. A. Col. I. 2./ Helochares/ sallaei,/ Sharp.", "Helocharis castaneus, Chev/ [illegible word] Sallé" [label folded over], "Helochares/ sallaei Sharp/ M. E. Bacchus det. 1981/ Holotype". The female genitalia are dissected and mounted next to the specimen (BMNH).

ADDITIONAL MATERIAL EXAMINED (4): **BELIZE: Belize District:** Western Highway near Zoo, pine grasslands, light trap, 7.i.2003, leg. C.R. Bartlett (2: AEZS). **COSTA RICA: Limón Prov.:** Gandoca Station, 0–50 m, leg. Porras, Gamoa, Briceno, Moraga, & Cárdenas, interception trap (2: AEZS, INBio).

DIFFERENTIAL DIAGNOSIS: Total length 6.6–7.6 mm. The distinctive aedeagus will easily separate this species. The distinct (although fine) dorsal punctation, darker color and usually sharply defined paler margins of the pronotum and elytra also help to characterize this species. Within Central America, it is most similar to *H. carmona*.

DISTRIBUTION: USA (Florida), Mexico (HANSEN 1999b), new records for Belize and Costa Rica.

REMARKS: Supposedly not native to the USA, where it has been collected along the margins of ponds and marshes in Florida (YOUNG 1954). The Belize specimens were collected at lights.

## Subgenus *Hydrobaticus* MACLEAY

*Hydrobaticus* MACLEAY, 1871: 131.
*Graphelochares* KUWERT, 1890: 38. – Syn.: d'ORCHYMONT 1919: 148.

### *Helochares* (*Hydrobaticus*) *championi* SHARP

*Helochares championi* SHARP, 1882: 75.
*Helochares* (*Hydrobaticus*) *championi* SHARP, 1882. – BALFOUR-BROWNE 1939: 293.

TYPE MATERIAL EXAMINED: **Lectotype** (♂), here designated: "Helochares/ championi/ D. S./ S. Geronimo/ Guatemala" [on same card as specimen], "Co-Type" [yellow disc], "San Geronimo/ Vera Paz./ Champion", "Sharp Coll./ 1905.-313.", "B. C. A. Col. I. 2./Helochares/ championi,/ Sharp", "LECTOTYPE/ Helochares/ championi/ Sharp, 1882/ des. A. Short 2004" (BMNH). **Paralectotypes (16):** There are additionally four specimens with the same locality, one specimen from Chontales, Nicaragua, one specimen from Duenas, Guatemala and ten specimens from Guatemala City, Guatemala. All these localities are mentioned by SHARP (1882) and are here considered paralectotypes (BMNH).

ADDITIONAL MATERIAL EXAMINED (36): **COSTA RICA: Puntarenas Prov.:** Las Cruces Biological Station, 3800' elev., 19.vi.2003, A.E.Z. Short (1: INBio). **GUATEMALA:** 20 mi. NW Chimaltengango, leg. P.J. Spangler (6: USNM); Vista Hermosa, 24.vi.1966, leg. Flint & Ortiz (29: USNM, AEZS).

DIFFERENTIAL DIAGNOSIS: Total length 6.2–6.4 mm. The dark center of the pronotal disc in combination with the lack of serial punctation or stria distinguish this species from other Central American *Helochares*. It is slightly but distinctly larger than the other two *Hydrobaticus* species that occur in Central America.

DISTRIBUTION: Costa Rica, Guatemala (SHARP 1882), Nicaragua.

REMARKS: The single specimen from Costa Rica is a female that was collected in an open stock water tank on the grounds of Las Cruces Biological Station; it has an egg case attached to its abdomen, as has been observed in other species of *Hydrobaticus*.

### *Helochares* (*Hydrobaticus*) *maculicollis* MULSANT

*Helochares maculicollis* MULSANT, 1844: 379.
*Philhydrus* (*Helochares*) *maculicollis* (MULSANT, 1844). – LECONTE 1855: 370.
*Helochares* (*Grapidelochares*) *maculicollis* MULSANT, 1844. – ZAITZEV 1908: 381.
*Helochares bipunctatus* SHARP, 1882: 76. – Syn.: d'ORCHYMONT 1943: 3.

TYPE MATERIAL EXAMINED:

*Helochares bipunctatus* SHARP: 2 **syntypes** (♀♀) (No lectotype designated). Syntype 1: "Helochares bipunctatus./type/ D. S./ Torola. 1000 ft. Guat-/ emala. Champion" [on card with specimen], "Sharp Coll. / 1905.- 313.", "Torola/ 1000 ft./ Champion", "B.C.A. Col. I. 2./ Helochares/ bipunctatus,/ Sharp". Syntype 2: Helochares bipunctatus/ Cordova,/Mexico/ Sallé", "Cordova", "Mexico./Salle Coll.", "B.C.A. Col. I. 2./ Helochares/ bipunctatus,/ Sharp" (BMNH).

ADDITIONAL MATERIAL EXAMINED: No additional material from Central America seen. **U.S.A.: Pennsylvania:** Chester County, Nottingham, 17.v.2002, pond margin, leg. A.E.Z. Short (2: AEZS). **Texas:** Fayette County, 1 mi S Warda on Route 77, 30.vii.2003, leg. A.E.Z. Short, AS-03-004 (4: AEZS).

DIFFERENTIAL DIAGNOSIS: Total length 5.0–5.6 mm. Very similar to *H. normatus*, but distinguished by having the serial punctures of the elytra situated in depressed stria. The other sympatric *Hydrobaticus* species, *H. championi*, is larger and lacks elytral serial punctures or stria.

DISTRIBUTION: Broadly distributed in the eastern United States, west to central Texas and south to Guatemala (HANSEN 1999b).

REMARKS: A mostly Nearctic species, it has been collected as far south as Guatemala. The synonymy with *H. bipuncatus* SHARP is here confirmed.

### *Helochares* (*Hydrobaticus*) *normatus* (LECONTE)
(Fig. 21)

*Philhydrus normatus* LECONTE, 1861: 341.
*Helochares normatus* (LECONTE, 1861). – HORN 1890: 252.
*Chasmogenus normatus* (LECONTE, 1861). – ZAITZEV 1908: 383.
*Helochares* (*Hydrobaticus*) *normatus* (LECONTE, 1861). – KNISCH 1924: 194.
*Helochares seriatus* SHARP, 1882: 76. – Syn.: d'ORCHYMONT 1943: 4.
*Helochares regularis* SHARP, 1882: 76. – Syn.: d'ORCHYMONT 943: 4.

TYPE MATERIAL EXAMINED:
*Helochares regularis* SHARP: **Holotype** (sex unknown) by monotypy: "Helochares regu/ laris./ Type/ D. S./ Mexico" [on same card as specimen", "Sharp Coll./ 1095.- 313.", "B.C.A. Col. I. 2./ Helochares/ regularis,/ Sharp.", "Holotype by monotypy/ A. Short 2004" (BMNH). (a second specimen from "agues Calientes City" is from the 1887 additions and therefore not part of the type material).

*Helochares seriatus* SHARP: There are 22 specimens with "B. C. A. Col. I. 2." labels. Seven are mounted on the typical B.C.A-style cards with Sharp's handwriting; of these, six are from San Geronimo (Guatemala) and one is

from Yautapec (Mexico). I consider the series to be conspecific with the concept of *H. normatus*. No lectotype was designated.

ADDITIONAL MATERIAL EXAMINED (182): **COSTA RICA: Guanacaste Prov.:** Highway 1, 0.2 km S of Santa Rosa National Park, in rocky pool E of Highway, 10 52.62'N, 85 35.28'W, 15.vi.2003, leg. A.E.Z. Short (46: AEZS, INBio); Río Santa Rosa at Highway 142, 5 km NE of Las Canas, creekside pools, 17.vi.2003, leg. A.E.Z. Short (23: AEZS, INBio); Rio Seco at Highway 1, N of Cirvelas, pools along river, 17.vi.2003, leg. A.E.Z. Short (1: INBio); near Carmona, Finca Aqua Fria, margin of Río Carmona, 15.i.2003, leg. A. Short, R. Roughley & W. Porras (1: AEZS); Río Animas at Hwy 4, 210 m, detrital pools and backwaters, 13.i.2004, leg. A.E.Z. Short & D. Lebbin, AS-04-040 (2: AEZS, INBio); same locality but 14.vi.2003 (3: INBio); Finca Jenny, 30 km N Liberia, 240 m, ii.1994, leg. E. Araya (3: INBio); Barra Honda National Park, 3 km NE Nacaome, 100 m, iii.1993, leg. M. Reyes (1: INBio); Guanacaste National Park, Playa Naranjo [Naranjo Beach], iv.1991, leg. E. Alcazar(1: INBio). **EL SALVADOR:** 7 mi. SE "Cd. Arce", 3.viii.1965, leg. P.J. Spangler (17: USNM); 15 mi. SW La Union, 31.vii.1965, leg. P.J. Spangler (6: USNM). **HONDURAS:** San Marcus Colon, 28.vii.1965, leg. P.J. Spangler (29: USNM); 10 mi. W Choluteca, 29.vii.1965, leg. P.J. Spangler (5: USNM). **NICARAGUA:** 12 mi N San Benito, 11.vii.1965, leg. P.J. Spangler (19: USNM); Somoto, 28.vii.1965, leg. P.J. Spangler (7: USNM); 22 mi. S Rivas, 26.vii.1965, leg. P.J. Spangler (3: USNM); Matagalpa, km 77.6 of PanAm Highway, 1290' elev., roadside pools, 4.viii.2002, leg. W.D. Shepard (1: AEZS). **U.S.A.: California:** Colusa County, Ladoga-Stonyford Rd, W of Ladoga, 5.viii.2001, 1200' elev., leg. A.E.Z. Short (15: AEZS). Representative specimens deposited in BMNH, CUIC, EMEC, MALUZ, MCZ, MFC, and NMW.

DIFFERENTIAL DIAGNOSIS: Total length 4.1–5.4 mm. See diagnosis of *H. maculicollis*.

DISTRIBUTION: U.S.A. (Arizona, California, Nevada, Texas), Guatemala, Mexico (HANSEN 1999b), new records for Costa Rica, Honduras, El Salvador, and Nicaragua.

REMARKS: A common element of western Nearctic fauna, *H. normatus* generally prefers drier, more arid regions. This is consistent with all the records for Costa Rica being from the dry forest regions of Guanacaste Province. It is commonly collected in the margins of streams and rivers and can be especially abundant as they are pooling up in the dry season. The synonomies of *Helochares regularis* SHARP and *Helochares seriatus* SHARP with this species are confirmed.

## Subgenus *Sindolus* SHARP

*Sindolus* SHARP, 1882: 72.

The two members of this subgenus are easily distinguished from other *Helochares* in Central America by the high, laminar mesosternal crest.

### *Helochares* (*Sindolus*) *mundus* (SHARP)
(Fig. 23)

*Sindolus mundus* SHARP, 1882: 73.
*Helochares* (*Sindolus*) *mundus* (SHARP, 1882). – KNISCH 1924: 199.

TYPE MATERIAL EXAMINED: **Holotype** (♀) by monotypy: "Sindolus/ mundus/ Type/ D. S./ Oaxaca. Mexico. Hoge" [on card with specimen], "Holo-type" [red disc], "Oaxaca,/ Mexico./ Hoege", "Sharp Coll./ 1905 – 313." [upside down], "B. C. A. Col. I. 2. / Sindolus/ mundus,/ Sharp.", "Sindolus/ mundus Sharp/ M. E. Bacchus det. 1981/ HOLOTYPE". Two other specimens from Vera Cruz, Mexico with Biologia Centrali Americana labels were not part of the original description (SHARP 1887).

ADDITIONAL MATERIAL EXAMINED (45): **COSTA RICA: Alajuela Prov.:** Caño Negro Wildlife Refuge, 20 m, 6.–28.vi.1994, leg. K. Flores (4: INBio). **Guanacaste Prov.:** near Carmona, HG-vapor light at laguna de Crocodilo, 34 m, 16.i.2003, leg. A.E.Z. Short, R. Roughley & W. Porras (2: AEZS); near Carmona, cattle pond, 44 m, 15.i.2003, leg. A.E.Z. Short, R. Roughley & W. Porras (1: AEZS); 30 km N Liberia, Finca Jenny, 20.vi.–11.vii.1992, leg. E. Araya (2: INBio); same locality but 6.–12.viii.1992 (1: INBio); same locality but 12.–19.ix.1995 (1: INBio); same locality but 11.iv.–11.v.1995 (1: INBio); same locality but 25.–29.v.1993 (1: INBio). **Puntarenas Prov.:** Corcovado National Park, Sirena Station, Playa Sirena, vi.1995, leg. G. Fonseca (2: INBio). **MEXICO:**

Jalisco Mpio., LaHuerta, Chamel Biological Station, 27.vii.1996, UV light, leg. W. Godwin (25: AEZS, TAMU); Campeche, 10.4 km E Escarcega, 26.vii.1980, at light, leg. Schaffner, Weaver & Friedlander (3: TAMU). **NICARAGUA:** Leon, 16.3 mi. SE Leon, 18.vi.1972, at light, leg. M.E. & R.R. Murry (2: TAMU).

DIFFERENTIAL DIAGNOSIS: Total length 3.7–4.4 mm. Separated from *H.* (*S.*) *optatus* (the only other sympatric species of the subgenus) by the enlarged antennal cupule, which is always distinctly broader than the first segment of the antennal club, and the tip of the central lobe of the aedeagus is expanded into a broad circle instead of tapered to a point (Fig. 23). The general punctation of the elytra and pronotum is also distinctly finer in this species, but this character is difficult to assess without examining comparative material.

DISTRIBUTION: Mexico; new records for Costa Rica and Nicaragua.

REMARKS: Encountered in similar habitat as *H. optatus*, with which it has been collected.

### *Helochares* (*Sindolus*) *optatus* (SHARP)
(Fig. 22)

*Sindolus optatus* SHARP, 1882: 72.
*Helochares* (*Sindolus*) *optatus* (SHARP, 1882). – KNISCH 1924: 199.
*Helochares* (s.str.) *guatemalensis* KNISCH, 1921: 68. – Syn.: d'ORCHYMONT 1937: 253.

TYPE MATERIAL EXAMINED: **Lectotype** (♀), here designated: "Sindolus/ optatus/ Type/ D. S./ Guatemala Champion/ Paso Antonio 400 ft. [on same card as specimen]", "Syn-type [blue disc]", "Type [red disc]", "Paso Antonio,/ 400 ft./ Champion.", "Sharp Coll./ 905-313 [label upside down]", "B.C.A. Col. I. 2./ Sindolus/ optatus, Sharp", "LECTOTYPE/ Sindolus/ optatus/ Sharp, 1882/ des. A. Short 2004" (BMNH). **Paralectotypes** (5 ♀♀): same locality as type (BMNH); one is completely disarticulated.

ADDITIONAL MATERIAL EXAMINED (147): **COSTA RICA: Alajuela Prov.:** Caño Negro Wildlife Refuge, 20 m, various dates and collectors (52: INBio). **Guanacaste Prov.:** near Carmona, HG-vapor light at laguna de Crocodilo, 34 m, 16.i.2003, leg. A.E.Z. Short, R. Roughley & W. Porras (49: AEZS, INBio); Palo Verde National Park, 25 m, HG-vapor light by lagoon, 11.i.2004, leg. A.E.Z. Short & D.J. Lebbin, AS-04-031 (1: INBio), Palo Verde National Park, Sector Palo Verde, 10 m, 10.x.1999, leg. W. Porras (9: INBio); Palo Verde National Park, Palo Verde Station, 27.xii.1992, leg. U. Chavarria (1: INBio); same locality but viii.1991 (1: INBio); same locality but x.1990 (4: INBio); same locality but i.1991 (1: INBio); Guanacaste National Park, Finca Jenny, 240 m, 20.–30.v.1994, leg. E. Araya (1: INBio); Guanacaste National Park, Las Almendros, 300 m, 8.–20.xi.1993, leg. E. López (1: INBio); 12 km S Cañas, black light, 16.vi.2003, leg. A.E.Z. Short (5: INBio). **Heredia Prov.:** La Selva, 22.–24.i.2000, leg. A.E.Z. Short (1: AEZS). **Limón Prov.:** Barra del Colorado Wildlife Refuge, Río Sardinas, 10 m, 20.xi.1992, leg. F. Araya (1: INBio), same locality but 14.x.1992 (2: INBio); same locality but 16.–34.vii.1993 (1: INBio); same locality but 14.–22.viii.1993 (1: INBio); Sector Cerro Cocori, Finca de E. Rojas, 150 m, leg. E. Rojas (1: INBio); same locality but i.1994 (1: INBio); same locality but 9.–30.xi.1992 (1: INBio). **Puntarenas Prov.:** Manuel Antonio National Park, Quepos, 80 m, iv.1991, leg. G. Varela (1: INBio); same locality but v.1991 (1: INBio); Osa Peninsula, Esquinas Station, sealevel, 8.–27.xi.1992, leg. A. Gutiérrez (1: INBio). **MEXICO:** Veracruz**,** 4 mi. E. Coatzocoalcos, 20.viii.1967, black light, leg. H.R. Burke (2: TAMU); Veracruz, 24 mi. E of Coatzocoalcos, 20.viii.1967, leg. H.R. Burke & J. Hafernik (1: TAMU); Tamaulipas, 8 mi. W of El Limón, 20.vii.1970, at light, leg. Murry, Phelps, Hart & Schaffner (6: AEZS, TAMU); Tamaulipas, 5 mi. SSE of Gomez Farias, 19.–20.vii.1970, leg. Murry, Phelps, Hart & Schaffner (1: TAMU). Representative specimens deposited in BMNH, CUIC, EMEC, MALUZ, MCZ, MFC, NMW, and USNM.

DIFFERENTIAL DIAGNOSIS: Total length 3.6–4.5 mm. See diagnosis of *H.* (*S.*) *mundus* for differential characters separating these two similar species.

DISTRIBUTION: Guatemala (SHARP 1882), new records for Costa Rica and Mexico.

REMARKS: Generally taken in stagnant waters at lower elevations in drier areas. At one collecting event at a mercury-vapor light situated in a drying lowland marsh, this species was extremely abundant.

## Genus *Quadriops* HANSEN

*Quadriops* HANSEN, 1999a: 131.

*Quadriops* contains six species in extending from southern Central America through northern South America (HANSEN 1999a, GARCÍA 2000a); the latter work provides a key to all known species.

### *Quadriops reticulatus* HANSEN

*Quadriops reticulatus* HANSEN, 1999a: 135.

MATERIAL EXAMINED (22): **COSTA RICA: Guanacaste Prov.:** Pitilla Station, Guanacaste National Park, 9 km S Station Cecilia, IX.1991, 700 m, leg. P. Rios (9: AEZS, INBio, NMW, USNM), same locality but 22.viii.1993, leg. C. Moraga (1: INBio); same locality but 9.–20.xi.1993 (1: AEZS); same locality but vii.1993, flight-intercept trap (1: INBio); same locality but vi.1994 (1: INBio); same locality but x.–xi.1993, leg. E. Araya (1: INBio). **Limón Prov.:** Sector Cerro Cocori, farm of E. Rojas, 150 m, leg. E. Rojas, x.1991 (3: AEZS, INBio); same locality but vi.1993 (1: INBio). **Puntarenas Prov.:** Golfito, Corcovado National Park, "C. Rincón", 745 m, leg. A. Azofeifa (1: INBio); Golfito, Golfo Dulce Reserve, Agujas Station, 250–350 m, 13.VII.1999, leg. A. Azofeifa, at lights (1: INBio); Coto Brus, Pittier Station, 1670 m, 31.x.–9.xi.1999, leg. J. Rodríguez, "colecta aquática" (1: INBio); same locality but 13.xi.2000, leg. W. Porras, Mantillo (1: INBio).

DIAGNOSIS: Total length 2.15–2.30 mm. *Quadriops* is easily distinguished from all other genera of Acidocerina in the New World by having the eyes divided into dorsal and ventral portions by the frons (also observed in *Omniops* PERKINS & SHORT and the chaetarthriine genus *Amphiops* ERICHSON).

DISTRIBUTION: Costa Rica, Panama (HANSEN 1999b).

REMARKS: The exact habitat of this genus remains uncertain. Specimens in Costa Rica have been collected in light-intercept traps, at lights, and apparently in an aquatic setting ("colecta aquatica"). Interestingly, there is a note with one series of specimens indicating they were collected on sap oozing from freshly cut trees in Guanacaste National Park.

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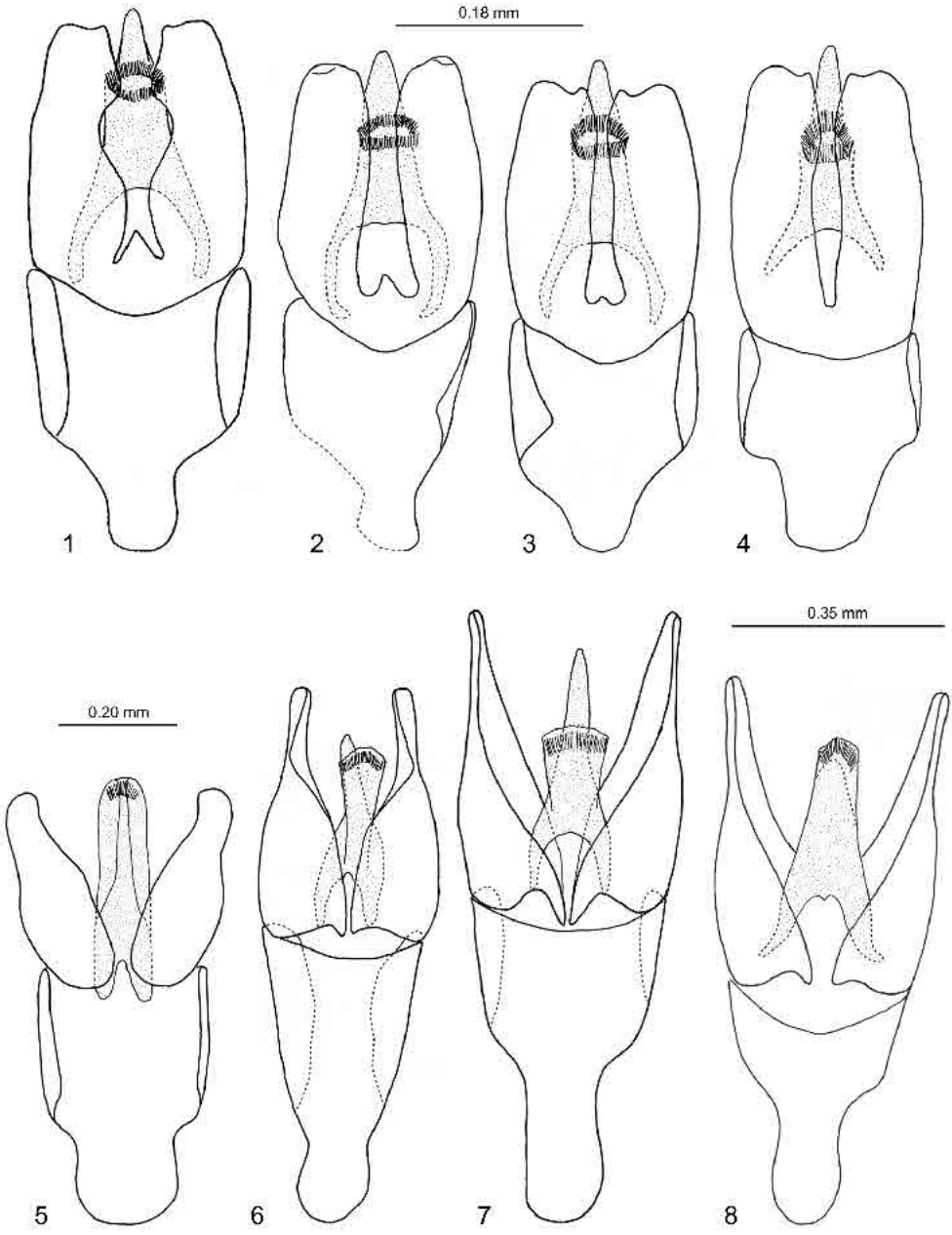
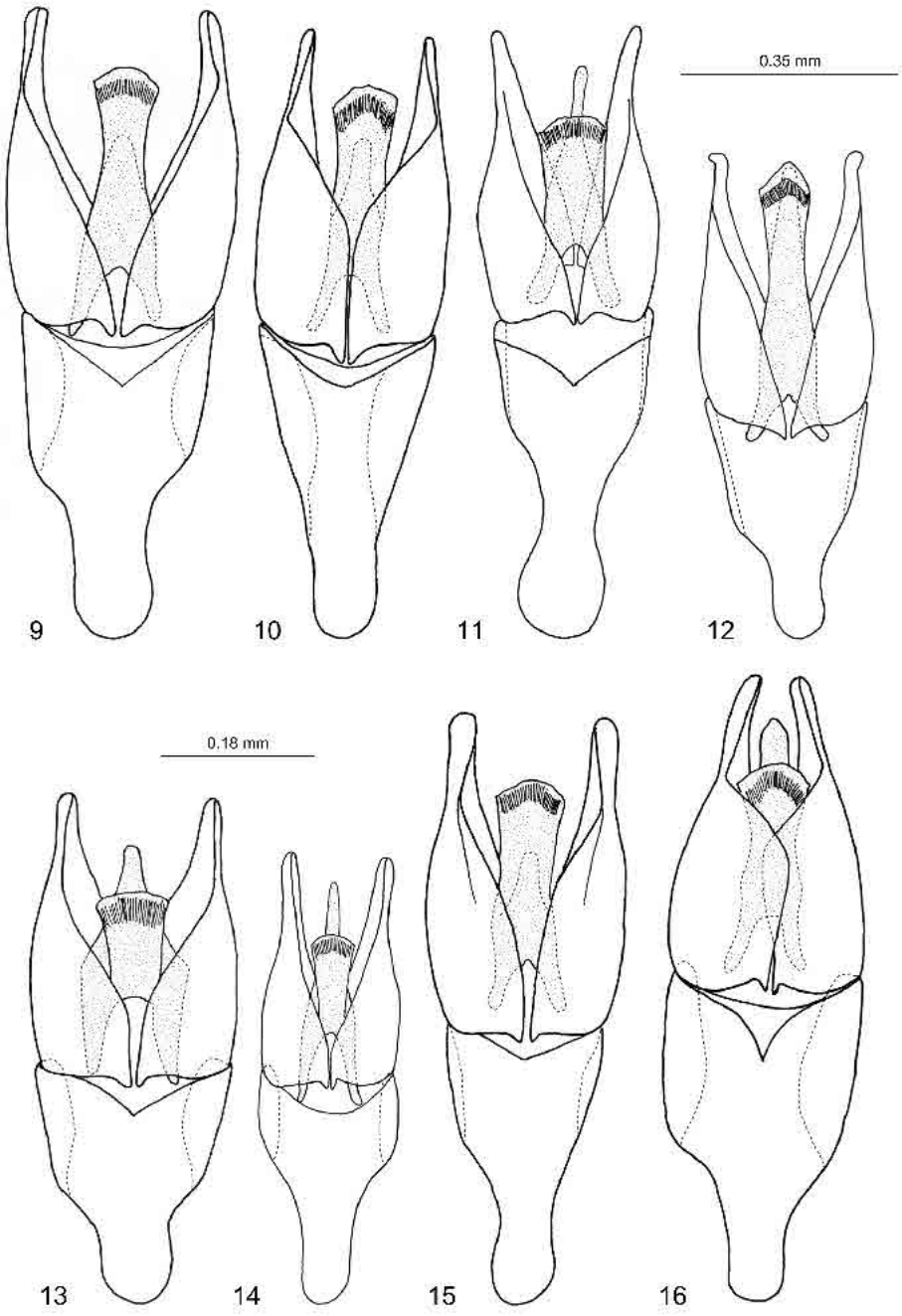
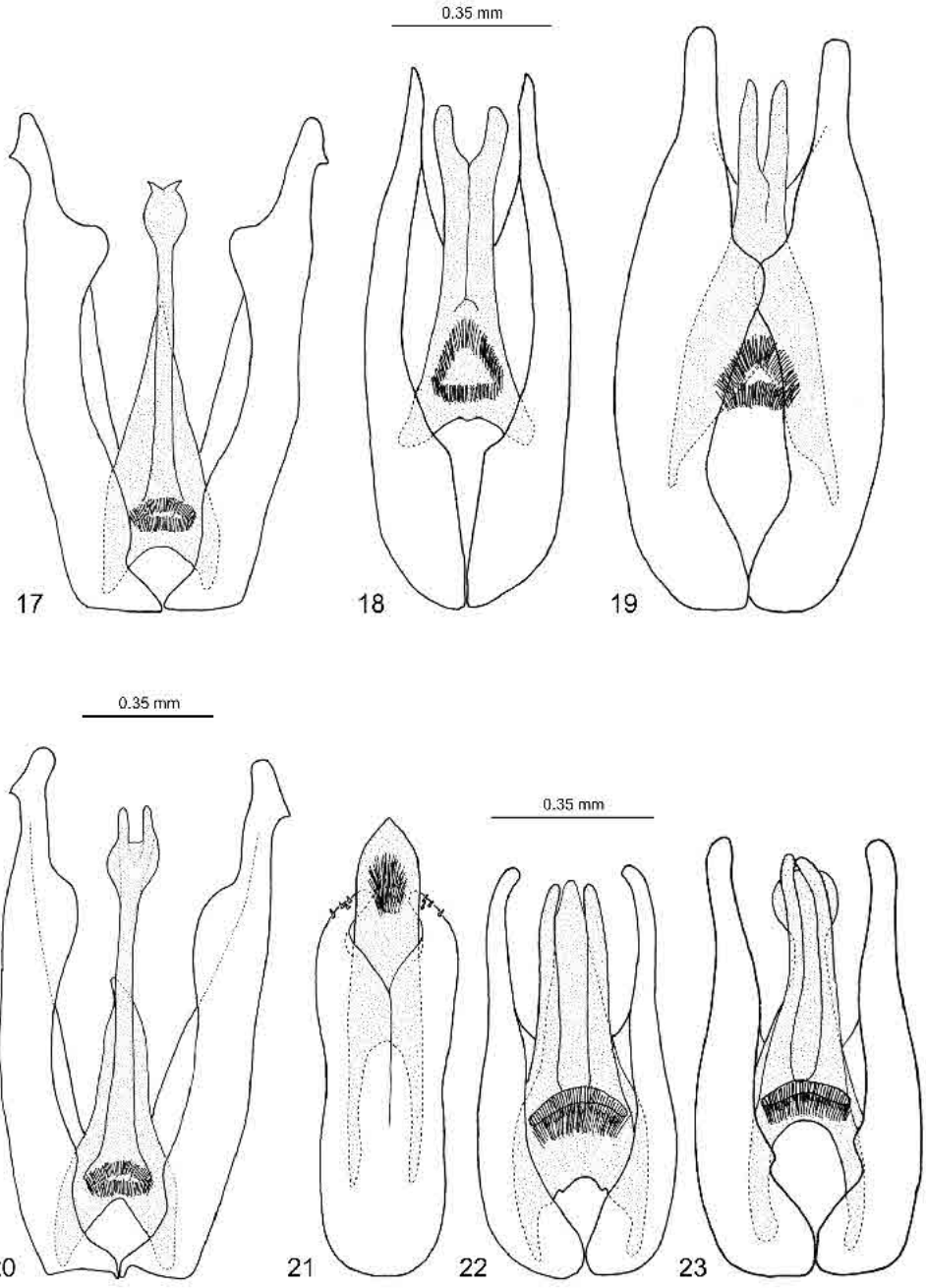



Figs. 1–5: Aedeagus, dorsal view, 1) *Chasmogenus barrae*, 2) *C. schoedli*,3) *C. lorenzo*. 4) *C. ruidus*, 5) *Enochrus* (*Hugoscottia*) *talamanca*. Figs. 6 – 8: Aedeagus, ventral view, 6) *Enochrus* (*Methydrus*) *costaricensis*, 7) *E.* (*M.*) *sharpi*, 8) *E.* (*M.*) *metacarina.*




Figs. 9–16: Aedeagus, ventral view, 9) *E.* (*M.*) *aequalis*, 10) *E.* (*M.*) *toro*, 11) *E.* (*M.*) *shepardi*, 12) *E.* (*M.*) *pseudochraceus*, 13) *E.* (*M.*) *debilis*, 14) *E.* (*M.*) sp. A, 15) *E.* (*M.*) *torito*, 16) *E.* (*M.*) *rivalis*.




Figs. 17–23: Aedeagus, dorsal view, basal piece omitted, 17) *Helochares* (*s.str.*) *abbreviatus*, 18) *H.* (*s.str.*) *carmona*, 19) *H.* (*s.str.*) *sallaei*, 20) *H.* (*s.str.*) *oculatus*, 21) *H.* (*Hydrobaticus*) *normatus*, 22) *H.* (*Sindolus*) *optatus*, 23) *H.* (*S.*) *mundus*.

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