©Wiener Coleopterologenverein (WCV), download unter www.biologiezentrum.at

Koleopterologische Rundschau	81	69–92	Wien, September 2011

Update on the hydraenid fauna of Costa Rica, with descriptions of six new species (Coleoptera: Hydraenidae)

M. BROJER & M.A. JÄCH

Abstract

Six new species of *Hydraena* KUGELANN (Coleoptera: Hydraenidae) are described: *H. esquinita*, *H. lagamba*, *H. lascrucensis*, *H. pajarita*, *H. pilimera*, and *H. sanagergelyae*. *Hydraena brevis* SHARP, 1882, *H. pontequula* PERKINS, 1980 and *Ochthebius mesoamericanus* PERKINS, 1980 are recorded for the first time from Costa Rica. A key to the species of the Hydraenidae of Costa Rica is provided.

Key words: Coleoptera, Hydraenidae, Costa Rica, new species, key to species.

Introduction

Central America has attracted entomologists for a long time. The first descriptions of Hydraenidae of this region were already published by SHARP (1882). Only six species of Hydraenidae were known to occur in Costa Rica until now: five *Hydraena* KUGELANN, 1794 and one *Gymnochthebius* ORCHYMONT, 1943. No new species of Hydraenidae have been described or reported from Costa Rica since PERKINS (1980), who described more than 70 % of the species known from Central America (incl. Mexico).

Although in Costa Rica interest in aquatic invertebrate communities increases, especially for ecological purposes, there is still a considerable lack of taxonomic resources and knowledge (SPRINGER 2008). The reason for the rather limited knowledge seems to be the lack of selective collecting. Apart from the material collected on a field trip to Costa Rica in March 2009 by the first author, additional specimens examined for this publication are by-catch material from flight intercept traps or were collected during projects not focussing on Hydraenidae.

In this paper six new species are described, three known species and one genus are reported for the first time from Costa Rica.

Material and methods

Specimens were examined using a binocular Wild M-10 microscope and a light microscope Olympus BH-2. Drawings were made using a camera lucida and Photoshop 7.0. Multilayer photographs were generated by using a stereomicroscope (Leica MZ16) connected to a camera (DFC490) and were processed and edited applying AutoMontage Pro and Adobe Photoshop 7.0.

The morphological terminology used herein follows mainly JÄCH et al. (2005).

The material examined is deposited in the following collections:

BMNH	The Natural History Museum, London, UK
INBio	Instituto Nacional de Biodiversidad, Santo Domingo de Heredia, Costa Rica
MCZ	Museum of Comparative Zoology, Cambridge, USA
NMW	Naturhistorisches Museum Wien, Austria
SEMC	Snow Entomological Collection, University of Kansas, Lawrence, USA
USNM	National Museum of Natural History, Washington, D.C., USA

©Wiener Coleopterologenverein (WCV), download unter www.biologiezentrum.at

Checklist of the Hydraenidae of Costa Rica

Asterisks indicate new country records.

Gymnochthebius perlabidus PERKINS, 1980

Hydraena brevis SHARP, 1882*

Hydraena colymba PERKINS, 1980

Hydraena esquinita **sp.n.**

Hydraena guadelupensis ORCHYMONT, 1923

Hydraena lagamba **sp.n.**

Hydraena lascrucensis **sp.n.**

Hydraena malkini PERKINS, 1980

Hydraena nevermanni PERKINS, 1980

Hydraena pajarita **sp.n.**

Hydraena pilimera **sp.n.**

Hydraena pontequula PERKINS, 1980*

Hydraena sanagergelyae **sp.n.**

Hydraena turrialba PERKINS, 1980

Ochthebius mesoamericanus PERKINS, 1980*

Key to the species of Hydraenidae of Costa Rica

This key is largely based on aedeagal characters. Thus, it should only be used for male specimens. For definite identification the examination of the aedeagus is indispensable.

1 Frons with a pair of ocelli. Apical segment of maxillary palpi peg-like, thinner than penultimate one. Pronotum margined by transparent cuticula 2

– Frons without ocelli. Apical segment of maxillary palpi not peg-like, not thinner than penultimate one. Pronotum without distinct transparent cuticula 3

2 Apex of main piece of aedeagus not bifid ..... *Ochthebius mesoamericanus*

– Apex of main piece of aedeagus bifid ..... *Gymnochthebius perlabidus*

3 Body outlines continuous, without evident angle between pronotum and elytra (habitus drop-shaped or ovate); maxillary palpi not exceedingly long, last segment not distinctly longer than penultimate one; pronotum broadest at base; elytra not punctate …… ..... [*Limnebius* LEACH, 1815 (not yet recorded from Costa Rica)]

– Body outlines not continuous, with angle between pronotum and elytra; maxillary palpi exceedingly long, last segment almost twice as long as penultimate one; pronotum broadest near middle; elytra always punctate 4

4 Pronotum markedly angulate in the middle, disc with indistinct median ridge and anterointernal foveolae, elytral gutter wide, more or less reaching elytral apex, labium with depressions near anterior margin ..... *Hydraena brevis*

– Pronotum weakly angulate in the middle, disc without trace of median ridge and anterointernal foveolae, elytral gutter not reaching elytral apex, labium without depressions near anterior margin 5

5 Pronotum with posterointernal foveolae ..... *Hydraena guadelupensis*

– Pronotum without posterointernal foveolae 6

6 Metaventrite with furrow lateral of plaque, elytra conjointly rounded apically, colouration of body reddish 7

©Wiener Coleopterologenverein (WCV), download unter www.biologiezentrum.at

– Metaventrite without furrow lateral of plaque, elytra tapered or truncate, but not conjointly rounded apically, colouration of body not reddish 8

7 Dorsal surface more strongly and more densely punctate, anterior pronotal margin with stridulatory plectrum, lateral gutter of elytra narrow, lateral hypomeron of pronotum approximately as broad as profemur ..... *Hydraena pajarita*

– Dorsal surface less strongly and less densely punctate, anterior pronotal margin without stridulatory plectrum, lateral gutter of elytra moderately broad, lateral hypomeron of pronotum broader than profemur ..... *Hydraena esquinita*

8 Pronotum entirely testaceous (Fig. 6) ..... *Hydraena sanagergelyae*

– Pronotal disc dark brown or black, anterior and posterior margins usually light brown to testaceous 9

9 Total length ≥ 1.8 mm; left paramere (when stretched out) exceeding main piece by almost 1/3 of length, apically hyaline, laterally pilose (Fig. 11) ..... *Hydraena pilimera*

– Total length < 1.8 mm; left paramere not exceeding main piece by almost 1/3 of length, not hyaline and not pilose laterally 10

10 Right paramere originating in basal third of aedeagal length; apical part of main piece bent in almost 90 degrees to the right in ventral view ..... *Hydraena turrialba*

– Right paramere originating distal of basal third of aedeagus; apical part of main piece not bent in almost 90 degrees to the right in ventral view 11

11 Both parameres inserted at almost equal level on main piece 12

– Right paramere inserted distinctly more proximal than left paramere 14

12 Distal lobe with flagellum ..... *Hydraena malkini*

– Distal lobe without flagellum 13

13 Distal lobe exceeds main piece by less than 1/10 of total aedeagal length ..... *Hydraena nevermanni*

– Distal lobe exceeds main piece by almost 1/5 of total aedeagal length ..... *Hydraena colymba*

14 Phallobase symmetrical; in ventral view apex of bisinuate apical part of aedeagal main piece oriented to the left or to the right, without hump-like structure on apical part of main piece 15

– Phallobase asymmetrical; in ventral view apex of bisinuate apical part of aedeagal main piece oriented to the left, hump-like structure at base of apical part of main piece and distal lobe with two lateral appendages (Fig. 8) ..... *Hydraena lagamba*

15 Aedeagus in ventral view with two lateral appendages on distal lobe, apex of bisinuate apical part of main piece oriented to the right in ventral view (Fig. 9) ..... *Hydraena lascrucensis*

– Aedeagus in ventral view with one distinct lateral appendage (second appendage rudimentary), apex of bisinuate apical part of main piece oriented to the right; distal lobe with distinct bulb-like structure ..... *Hydraena pontequula*

Gymnochthebius perlabidus PERKINS, 1980

Gymnochthebius perlabidus PERKINS 1980: 286.

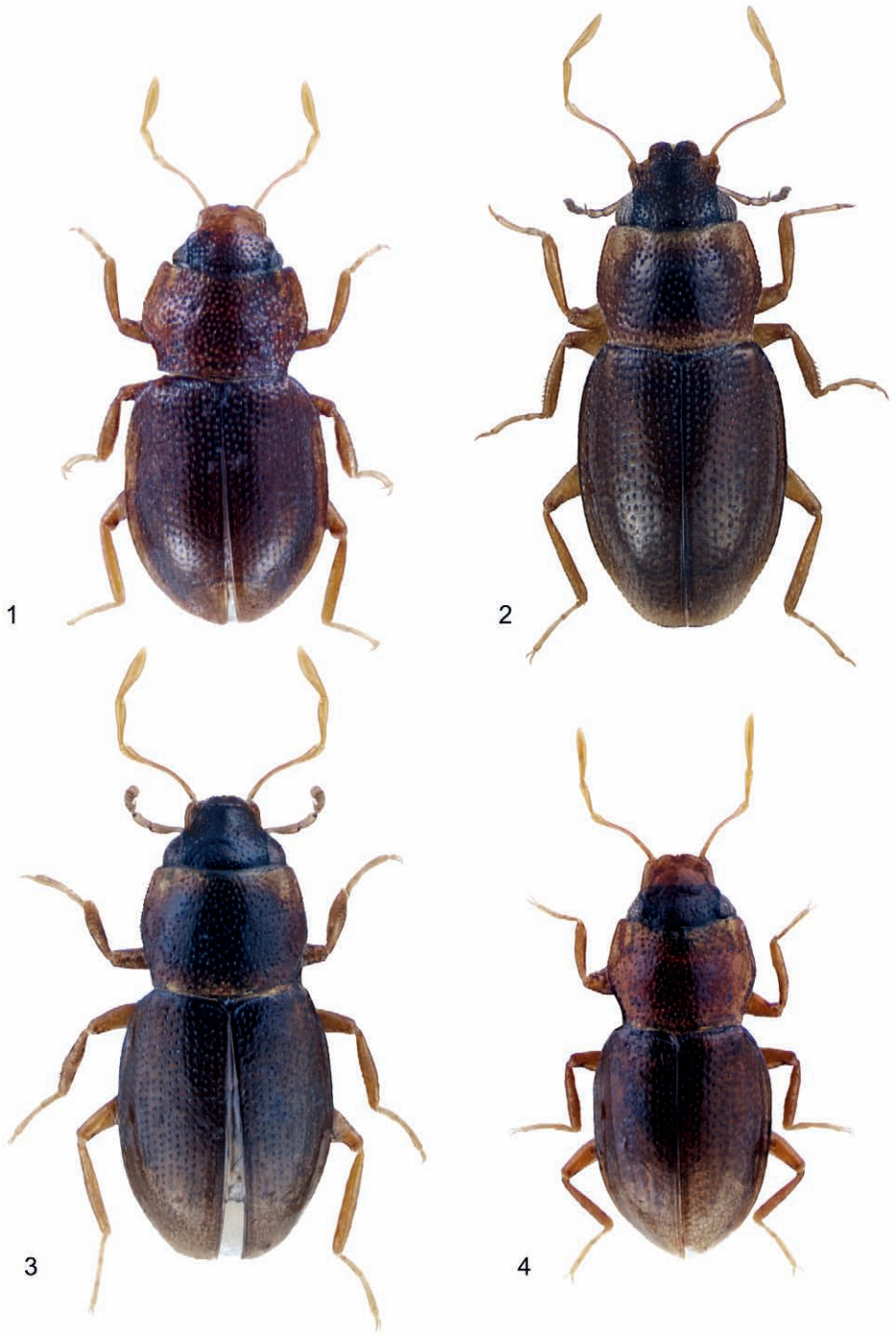
For a detailed description see PERKINS (1980: 286–287).

DISTRIBUTION: Costa Rica, Limón Prov. (PERKINS 1980).

Hydraena (s.str.) *brevis* SHARP, 1882

Hydræna brevis SHARP 1882: 94.
Spanglerina brevis (SHARP): PERKINS 1980: 220.
Hydraena (s.str.) *brevis* SHARP: PERKINS 1997: 205.

©Wiener Coleopterologenverein (WCV), download unter www.biologiezentrum.at



Figs. 1–4: Habitus of 1) *Hydraena esquinita*; 2) *H. lagamba*; 3) *H. lascrucensis*; 4) *H. pajarita*.

©Wiener Coleopterologenverein (WCV), download unter www.biologiezentrum.at

Figs. 5–6: Habitus of 5) *Hydraena pilimera*; 6) *H. sanagergelyae*.

TYPE MATERIAL EXAMINED: **Lectotype** ♀ (BMNH): "LECTO \ TYPE \\ TYPE \\ San Joaquin, Vera Paz. \ Champion. \\ Sharp Coll. \ 1905.–313. \\ B.C.A. Col. I. 2. \ Hydræna \ brevis, \ Sharp \\ LECTOTYPE \ Spanglerina \ brevis (Sharp) \ by P.D. Perkins".

ADDITIONAL MATERIAL EXAMINED:

MEXICO: Oaxaca Prov.: 1 ♂ (MCZ): "MEXICO, Oaxaca \ 4 mi. S. Valle Nacional \ cascading tropical brook \ 6-VII-1974, ME&PD Perkins \\ Spanglerina \ brevis \ (Sharp) \ Det.P.D.Perkins".

COSTA RICA: Alajuela Prov.: 1 ♀ (NMW): "CR: Prov. Alajuela (CR24) \ Río Cataratas, ca. 770 m a.s.l. \ SE Los Lagos \ at San Ramón-Fortuna Road \ 10°13'04"N / 84°32'41"W \ 29.3.09, leg. M. Brojer"; 1 ♀ (NMW): "COSTA RICA: Alajuela Prov. \ 11.1.2003 (CR-03-01) \ Río Cataratas \ leg. A.E.Z. Short & R.E. Roughly \\ 3 km SE Los Lagos \ at San Ramon-Fortuna Road \ 750 m elev. \ waterfall and stream margin". **Cartago Prov.:** 3 ♀♀ (NMW): "CR: Prov. Cartago (CR14a) \ Río Tuis (riffle), ca. 7.8 km SE \ Turrialba, nr. Canada (vill.) \ ca. 619 m a.s.l. \ 9°51'37"N / 83°37'33"W \ 15.+16.3.2009, leg. M. Brojer"; 7 ♀♀ (NMW): "CR: Prov. Cartago (CR15a) \ Qu.[ebrada] nr. Tuis (vill.), ca. 13.2 km \ SO Turrialba, ca. 773 m a.s.l. \ 9°50'01"N / 83°35'09"W \ 17.3.09, leg. M. Brojer \\ ca. 0.8 km SW Tuis (vill.) \ ca. 3.7 km SO La Suiza (vill.)"; 5 ♀♀ (NMW): "CR: Prov. Cartago (CR15b) \ Qu.[ebrada] nr. Tuis (vill.), ca. 13.3 km \ SO Turrialba, ca. 812 m a.s.l. \ 9°49'52"N / 83°35'11"W \ 17.3.09, leg. M. Brojer \\ ca. 1.1 km SW Tuis (vill.) \ ca. 3.8 km SO La Suiza (vill.) \ at waterfall"; 1 ♀ (NMW): "COSTA RICA: Cartago Prov. \ Río Macho, 3 km S Río Macho \ 1500 müNN [a.s.l.], 21.06.1995 \ leg. T. Goldschmidt (CR 014b)"; 5 ♀♀ (INBio, USNM): Costa Rica: Cargato Prov. \ Tapanti National Park \ Oropendola trail \ 17.vii.2011, leg. A. Short \ (CR11-0717-01A). **Guanacaste Prov.:** 5 ♀♀ (NMW, INBio): "CR: Prov. Guanacaste (CR18) \ NP Guanacaste, Qu.[ebrada] Yegüito \ crosses road to Maritza \ Field Station, ca. 316 m a.s.l. \ 10°57'37"N / 85°32'34"W \ 24.3.09, leg. M. Brojer"; 1 ♀ (NMW): "CR: Prov. Guanacaste (CR19) \ NP Guanacaste, Qu.[ebrada] Tempisquito \ nr. Maritza Field Station \ ca. 597 m a.s.l. \ 10°57'31"N /

©Wiener Coleopterologenverein (WCV), download unter www.biologiezentrum.at

85°29'35"W \ 25.3.09, leg. M. Brojer"; 2 ♀♀ (SEMC): "COSTA RICA:Guanacaste \ Maritza Biol.Sta.,550m \ 22 May 1993 \ J.S. & A.K. Ashe #36 \ ex:flight intercept trap"; 1 ♀ (SEMC): "COSTA RICA:Guanacaste \ Maritza Biol. Stn., 550m \ 22 May 1993, J. & A. Ashe \ ex: flight intercept trap#036"; 1 ♀ (NMW): "COSTA RICA: Guanacaste Prov. \ Quebrada Florcita, Cacao \ 740 müNN [a.s.l.], 28.02.1996 \ leg. T. Goldschmidt (CR 140a)". **Heredia Prov.:** 1 ♂, 1 ♀ (NMW): "COSTA RICA: Heredia Prov. \ Bach bei [stream at] El Ceibo \ 530 müNN [a.s.l.], 08.04.2003 \ leg. T. Goldschmidt (ALAS-4)"; 1 ♂ (NMW): "COSTA RICA: Heredia Prov. \ Quebrada al Tanque, El Ceibo \ 540 müNN [a.s.l.], 08.04.2003 \ leg. T. Goldschmidt (ALAS-5)"; 1 ♀ (NMW): "COSTA RICA: Heredia Prov. \ Quelle am [spring at] Río Bijagual \ El Ceibo, 390 müNN [a.s.l.] \ 11.04.2003 \ leg. T. Goldschmidt (ALAS-11)"; 2 ♀♀ (NMW): "COSTA RICA: Heredia Prov. \ Bach bei [stream at] El Ceibo \ 480 müNN [a.s.l.], 12.04.2003 \ leg. T. Goldschmidt (ALAS-14a)"; 1 ♀ (NMW): "COSTA RICA: Heredia Prov. \ Bach bei [stream at] El Ceibo \ 480 müNN [a.s.l.], 12.04.2003 \ leg. T. Goldschmidt (ALAS-15a)". **Limón Prov.:** 1 ♀ (NMW): "COSTA RICA: Limón Prov. \ Zufluß [tributary] Río Corinto \ 6 km N Río Sucio \ 500 müNN [a.s.l.], 04.07.1995 \ leg. T. Goldschmidt (CR 047)". **San José Prov.:** 6 ♀♀ (INBio, NMW): "CR: Prov. San Jose (CR16a) \ NP Braulio Carillo, ca. 560 m a.s.l. \ 10°09'41"N / 83°56'07"W \ 20.3.09, leg. M. Brojer \\ small trib. to Qu.[ebrada] Gonzalez \ ca. 2.6 km O [east of] Qu.[ebrada] Gonzalez \ Ranger Station". **Puntarenas Prov.:** 1 ♀ (SEMC): "COSTA RICA:Puntarenas \ Monteverde, 1420m \ 14 May 1989, J. Ashe, R. Brooks, R. Leschen \ ex., moss covered rock \\ Snow Entomol. Mus. \ Costa Rica Exped. #187"; 1 ♀ (SEMC): "COSTA RICA: Puntarenas Prov. \ Las Cruces Biol Sta., 1330m \ 08°47.14'N, 82°57.58'W \ 28-31-V-2004. J.S.Ashe, Z.Falin, \ I. Hinojosa. Ex: flight intercept trap. CR1AFH04 060 \\ [barcode] \ SM0621514 \ KUNMW-ENT"; 1 ♀ (NMW): "COSTA RICA: Puntarenas Prov. \ Quebrada Alondra \ Ecolodge San Luis \ 1020 müNN [a.s.l.], 26.06.1995 \ leg. T. Goldschmidt (CR 023b)".

DIFFERENTIAL DIAGNOSIS: Body 1.60–1.80 mm long. Externally, *H. brevis* can be easily distinguished from all other species known from Costa Rica by the markedly angulate pronotum, the (sometimes quite indistinct) median ridge and anterointernal foveolae of the pronotum, the depressions near the anterior margin of the labium, and the very widely explanate elytral gutter reaching the elytral apex. For a detailed description and aedeagus illustration of *H. brevis* consult PERKINS (1980: 214, Fig. 65A–F, 220–221, Fig. 67A).

REMARKS: Males are remarkably underrepresented in *H. brevis*; only two males were found among 50 specimens (see also PERKINS 1980, 1997).

DISTRIBUTION: Guatemala, Honduras, Mexico, Panama (PERKINS 1980), Costa Rica (first record).

Hydraena (*Hydraenopsis*) *colymba* PERKINS, 1980

Hydraena colymba PERKINS 1980: 193.

TYPE MATERIAL EXAMINED: **Holotype** ♂ (USNM): "GUATE., Jalapa, 6 mi. N. \ Jalapa, slow stream in \ open, xeric situation \ 15-VI-1974, ME&PD Perkins \\ HOLOTYPE \ Hydraena \ colymba \ P.D. Perkins [red label] \\ BLNO \ 003972 [blue label]". **Paratype** ♀ (USNM): "GUATE., Jalapa, 6 mi. N. \ Jalapa, slow stream in \ open, xeric situation \ 15-VI-1974, ME&PD Perkins \\ ALLOTYPE \ Hydraena \ colymba \ P.D. Perkins".

DIFFERENTIAL DIAGNOSIS: As most of the species of the *H. marginicollis*-group (sensu PERKINS 1980) and especially those summarized within the *H. marginicollis*-subgroup, *H. colymba* can only be clearly distinguished by the shape of the aedeagus. For a detailed description and illustration of the aedeagus of *H. colymba* consult PERKINS (1980: 193–195, Fig. 60A).

DISTRIBUTION: Costa Rica (Guanacaste Prov.), Guatemala, Honduras, Mexico (PERKINS 1980) and Nicaragua (DELGADO et al. 1997).

Hydraena (*Hydraenopsis*) *esquinita* sp.n.

TYPE LOCALITY: Quebrada Esquinas, ca. 16 km N Golfito, Puntarenas Province, Costa Rica (Fig. 14).

©Wiener Coleopterologenverein (WCV), download unter www.biologiezentrum.at

TYPE MATERIAL: **Holotype** ♂ (NMW): "CR: Prov. Puntarenas (CR7) \ Qu.[ebrada] Esquinas, ca. 16 km N Golfito \ ca. 10 km NO Field Station \ La Gamba, 622 m a.s.l. \ 8°47'04"N / 83°10'19"W \ 5.3.09 \ leg. M. Brojer".

DESCRIPTION (male): Habitus as in Fig. 1. Body approximately 1.20 mm long.

Colour: Head bicoloured; frons dark brown, labrum paler reddish brown; elytra, pronotum and body appendages (maxillary palpi, antennae and legs) reddish brown; colouration on pronotal disc slightly darker.

Thorax: Pronotum with hardly perceptible anteroexternal foveolae; punctures moderately deeply impressed, separated by less than one puncture diameter, interstices glabrous. Lateral rim strong and denticulate; anteriorly slightly arcuate, posteriorly sinuously convergent. Anterior margin of pronotum concave. Lateral hypomeron distinctly broader than profemur.

Elytra oval, conjointly rounded apically; approximately 14 (10 between suture and shoulder) subregular rows of moderately strongly impressed punctures; punctures usually separated by less than one puncture diameter, sometimes even transversally confluent between adjacent rows. Lateral gutter moderately broad, not reaching apex. Procoxae separated by about half the distance between median and internal carina of mesoventrite, mesocoxae separated almost by same distance as between median and internal carina of mesoventrite, metacoxae separated by greater distance than between median and internal carina of mesoventrite; metaventrite with slightly elevated, shortened narrow plaques separated by ca. 10 times plaque width, metaventral disc almost flat, with furrow lateral of plaques; inflexed lateral portion approximately as broad as mesofemur, almost reaching apex.

Aedeagus (Fig. 7a–b): Main piece 255 µm long and slender, more or less straight in ventral view, evenly curved in lateral view; subapical part slightly bulged in lateral view, with one ventral seta placed inside a cavity. Distal lobe not clearly delimited from main piece; elongate, with short terminal flagellum. Phallobase slightly asymmetrical. Parameres short, approximately of same length (ca. 1/6 of aedeagal length); right paramere simple, slender, inserted at about basal 0.6 of aedeagal length, bearing a row of five moderately long setae along ventral margin of apex; left paramere slender, bifurcate in apical 0.3 (in lateral view), with hyaline cuticula between branches, and with four setae: two tiny setae on right margin near middle, two distinctly longer setae in apical third, on dorsal margin near apical 0.3, and on apex of dorsal branch of furcation.

Secondary sexual characters: Abdominal segments 7 and 8 of male moderately enlarged, tergite X of male slightly emarginate apically.

DIFFERENTIAL DIAGNOSIS: *Hydraena esquinita*, as most of the species known from Costa Rica, may be assumed to be a member of the *H. marginicollis*-group. Moreover the reddish brown appearance and the furrow lateral of the plaques distinguish *H. esquinita* from all Costa Rican species except *H. brevis* and *H. pajarita*. Externally, *H. esquinita* can be differentiated from *H. pajarita* by the less strongly and less densely punctate dorsal surface, by the lack of an occipital-pronotal stridulatory apparatus, and by the almost flat mesoventrite. For distinguishing *H. brevis* see the 'Differential Diagnosis' there.

DISTRIBUTION (Fig. 13): Known only from the type locality (Puntarenas Prov., Costa Rica).

ECOLOGY: This species was collected together with *Hydraena lagamba* from a residual ditch with clay sediment (Fig. 14).

ETYMOLOGY: This species is named after the brook (Quebrada Esquinas) of the type locality. The minor form is chosen because of the relatively small size of the species.

©Wiener Coleopterologenverein (WCV), download unter www.biologiezentrum.at

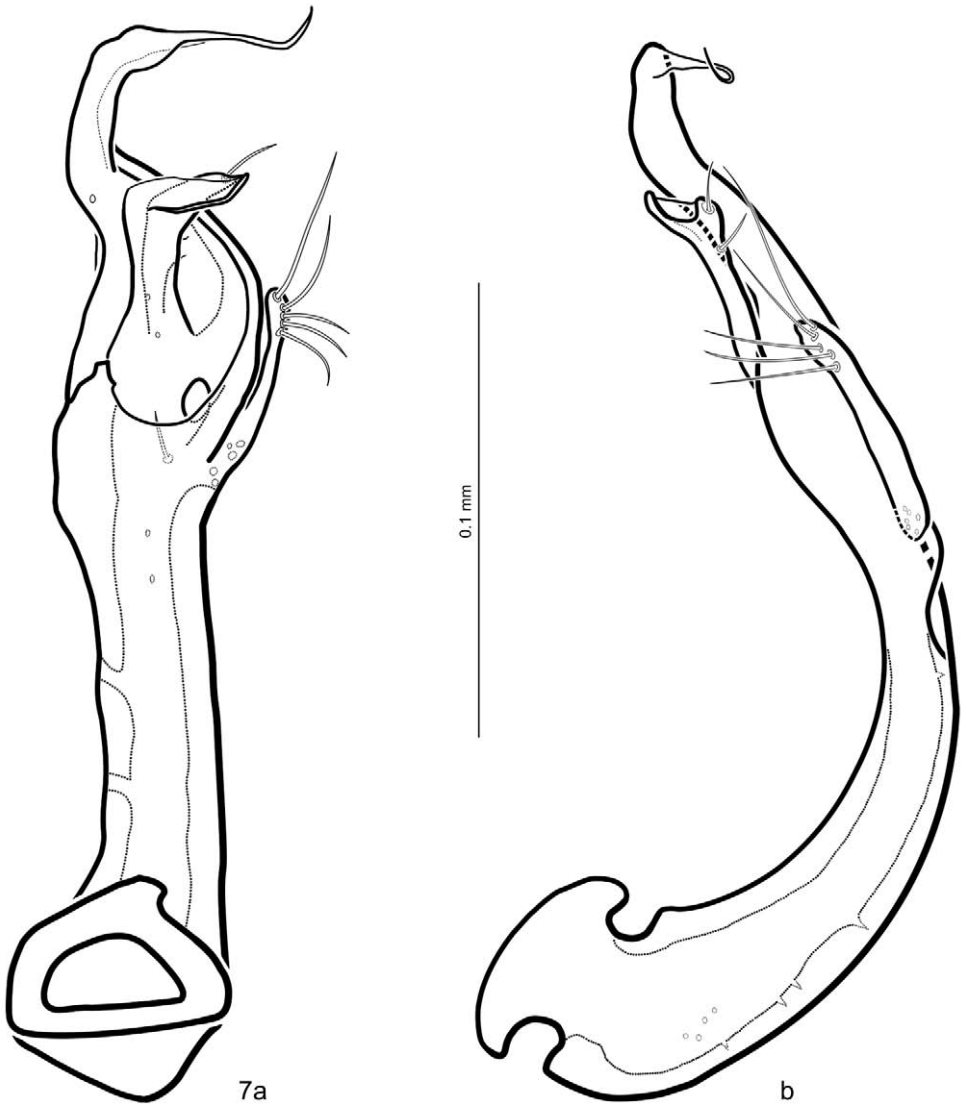


Fig. 7: *Hydraena esquinita*; aedeagus in a) ventral and b) lateral view.

©Wiener Coleopterologenverein (WCV), download unter www.biologiezentrum.at

Hydraena (*Hydraenopsis*) *guadelupensis* ORCHYMONT, 1923

Hydraena (s.str.) *guadelupensis* ORCHYMONT 1923: 37.

DIFFERENTIAL DIAGNOSIS: *Hydraena guadelupensis* is the only representative of the *H. leechi*-group (sensu PERKINS 1980) known to occur in Costa Rica. Its posterointernal foveolae on the pronotum distinguish it from all other species of *Hydraenopsis* JANSSENS in Costa Rica. For a detailed description and aedeagus illustration consult PERKINS (1980: 145, Fig. 44D).

DISTRIBUTION: Costa Rica, Jamaica, Lesser Antilles (Guadaloupe) (PERKINS 1980).

Hydraena (*Hydraenopsis*) *lagamba* sp.n.

TYPE LOCALITY: Quebrada Negra, at Field Station La Gamba, near La Gamba village, ca. 8 km NW Golfito, Puntarenas Province, Costa Rica (Fig. 15).

TYPE MATERIAL: **Holotype** ♂ (NMW): "CR: Prov. Puntarenas (CR4) \ Qu.[ebrada] Negra, ca. 8 km NW Golfito \ nr. La Gamba (vill.), at Field Station \ La Gamba, 90 m a.s.l. \ 8°42'06"N / 83°12'07"W \ 1.-3.3.09, leg. M. Brojer". **Paratypes**: 1 ♂ (INBio): same data as holotype; 1 ♂ (NMW): same data as holotype + additional label "IBE-RA 128"; 4 ♂♂ (INBio, USNM, NMW): "CR: Prov. Puntarenas (CR7) \ Qu.[ebrada] Esquinas, ca. 16 km N Golfito \ ca. 10 km NO Field Station \ La Gamba, 622 m a.s.l. \ 8°47'04"N / 83°10'19"W \ 5.3.09, leg. M. Brojer"; 1 ♂ (NMW) "CR: Prov. Puntarenas (CR9) \ Río Sardinal, ca.10.8 km NW \ Golfito \ 79 m a.s.l. \ 8°43'26"N / 83°12'37"W \ 6.3.09, leg. M. Brojer \\ ca. 0.2 km upstream \ from confluence with R. Bonito \ ca. 3 km N Field Station \ La Gamba"; 1 ♂, partly damaged (USNM): "COSTA RICA: Puntarenas \ Rincon, 17 km NE, Cerro Helado \ 21-25 JUN 1997; S.&J.Peck \ CR1P97 026, 250 m \ ex: flight intercept trap \\ [barcode] SM0332816 \ KUNMW-ENT"; 1 ♂ (USNM; Aed damaged) same locality, but "[barcode] SM0332818 \ KUNMW-ENT".

Note: The type series does not include any females. At two locations (CR4, CR9) a total of 19 females was collected. All of them are very similar to the male paratypes. However, based on external variability it is well possible that they represent in fact a mix of two or even three very closely related species. More males will have to be collected to define the variability of this species. Thus, only males are included in the paratype series of *H. lagamba*. No females were collected at CR7.

DESCRIPTION (male): Habitus as in Fig. 2. Body approximately 1.30–1.50 mm long.

Colour: Head (frons and labrum) dark brown to black; body appendages (maxillary palpi, antennae, and legs), margins and anterior corners of pronotum paler yellowish brown; pronotal disc and elytra brown.

Thorax: Pronotum with distinct anteroexternal foveolae; punctures moderately deeply impressed (more shallow on pronotal disc than towards margins) and separated by approximately one puncture diameter, interstices glabrous. Lateral rim denticulate, anteriorly slightly convergent, posteriorly sinuously convergent. Anterior margin of pronotum concave. Lateral hypomeron approximately as broad as profemora.

Elytra elongate oval, apically truncate; approximately 14 (10 between suture and shoulder) subregular rows of not deeply impressed punctures with approximately one puncture diameter between intervals and interstices. Lateral gutter narrow, not reaching apex. Procoxae separated by median carina of prosternum, mesocoxae separated by less than half distance of median and internal carina of mesoventrite, metacoxae separated by same distance as median and internal carina of mesoventrite; metaventrite with flat elongate, moderately developed plaques separated by ca. two times plaque width, metaventral disc moderately deeply impressed; inflexed lateral portion of elytra approximately as broad as mesofemur, not reaching apex.

©Wiener Coleopterologenverein (WCV), download unter www.biologiezentrum.at

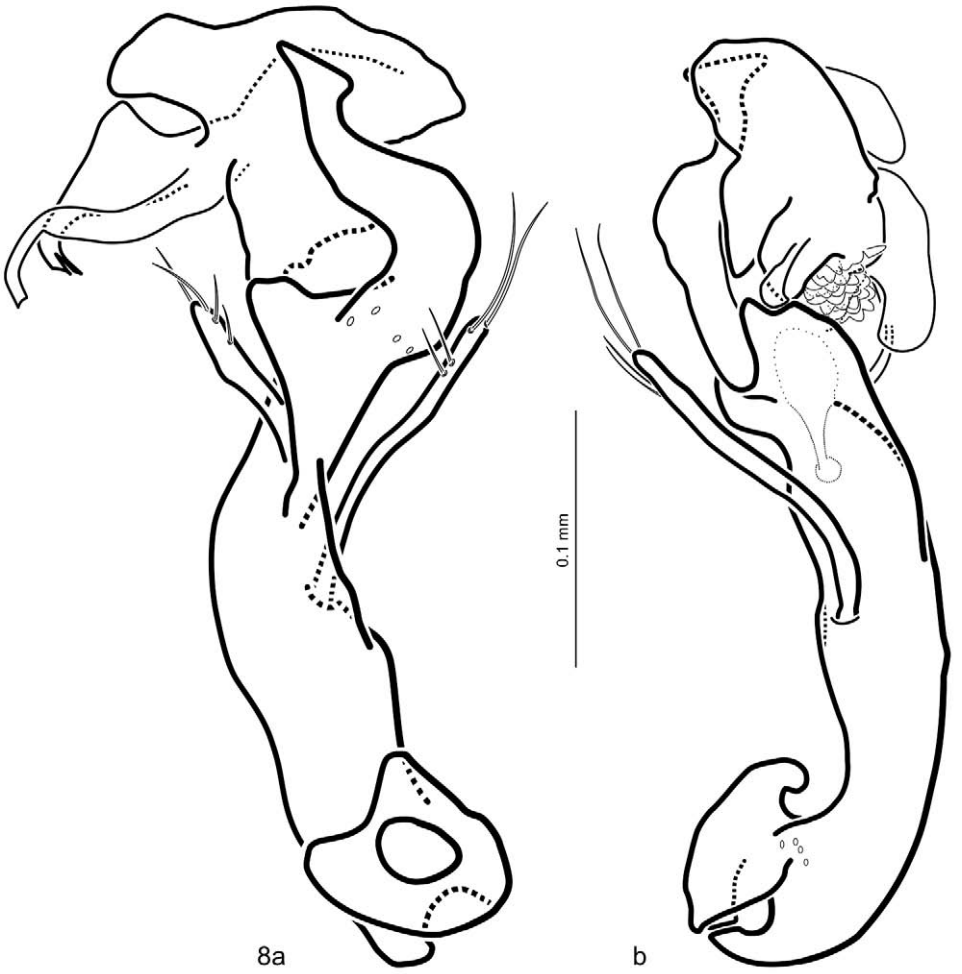


Fig. 8: *Hydraena lagamba*; aedeagus in a) ventral and b) lateral view.

©Wiener Coleopterologenverein (WCV), download unter www.biologiezentrum.at

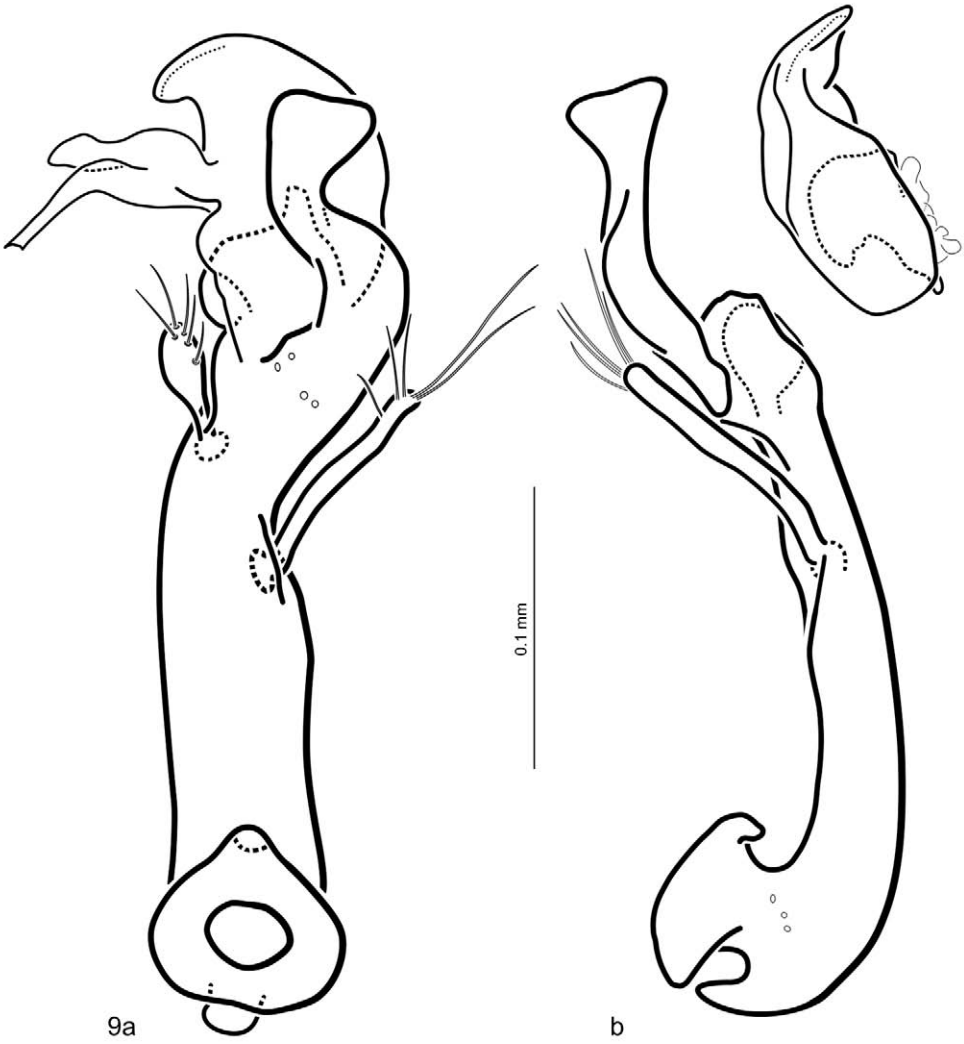


Fig. 9: *Hydraena lascrucensis*; aedeagus in a) ventral and b) lateral view.

©Wiener Coleopterologenverein (WCV), download unter www.biologiezentrum.at

Aedeagus (Fig. 8a–b): Main piece 350 µm long and slender, in ventral view basal portion of main piece more or less straight, slightly twisted, in apical half curved to right side, in apical third attenuate, distinctly curved to left, apex pointed; in lateral view strongly curved basally, then rather straight; phallobase asymmetrical. Distal lobe large, intricately shaped, with two spur-like appendages on left side. Parameres articulately connected to main piece; left paramere short, strongly widened in apical half, inserted at approximately 0.6 of aedeagal length, bearing 4–5 moderately long setae on ventral margin in apical 0.3; right paramere distinctly longer, slender, inserted approximately at basal 0.4 of aedeagal length, bearing ca. five moderately long setae on ventral margin in apical 0.4.

Secondary sexual characters: Abdominal segments 7 and 8 of male strongly enlarged, male tergite X distinctly excised apically.

DIFFERENTIAL DIAGNOSIS: The shape of the aedeagus indicates a very close relationship with *H. lascrucensis* and *H. pontequula*. *Hydraena lagamba* can be distinguished from these two species, among other characters, by the distinctly asymmetrical phallobase, the uneven shape of the basal portion of the main piece, and the shape of the apex of the main piece in ventral view.

DISTRIBUTION (Fig. 13): Costa Rica. So far known from four localities in Puntarenas Province.

ECOLOGY: Most specimens were collected at sandy to gravelly margins of small brooks. One specimen was found in a flight intercept trap.

At the type locality, *H. lagamba* was collected together with *H. pontequula*, *H. turrialba* and *H. sanagergelyae*. At Quebrada Esquinas, *H. lagamba* was found together with *H. esquinita.*

ETYMOLOGY: This species is named after La Gamba Field Station, where it was collected in a stream (Quebrada Negra) nearby.

***Hydraena* (*Hydraenopsis*) *lascrucensis* sp.n.**

TYPE LOCALITY: Las Cruces Biological Station, Puntarenas Province, Costa Rica.

TYPE MATERIAL: **Holotype** ♂ (INBio): "COSTA RICA: Puntarenas Prov. \ Las Cruces Biol. Sta., 1330m \ 8°47.14'N, 82°57.58'W \ 28-31-V-2004. J.S.Ashe, Z.Falin, \ I. Hinojosa. Ex: flight intercept trap. CR1AFH04 060 \\ Hydraenidae \ Det. ZHFalin & \ MLJeng '04 \\ [barcode] SM0611786 \ KUNMW-ENT".

DESCRIPTION (male): Habitus as in Fig. 3. Body approximately 1.50 mm long.

Colour: Head (frons and labrum) dark brown to black; body appendages (maxillary palpi, antennae and legs), anterior and posterior margins and especially anterior corners of pronotum paler yellowish brown; pronotal disc and elytra brown.

Thorax: Pronotum with distinct anteroexternal foveolae; punctures moderately deeply impressed and separated by two puncture diameters on pronotal disc and one puncture diameter towards margins; interstices glabrous. Lateral rim weak, denticulate, anteriorly slightly convergent, posteriorly sinuously convergent. Anterior margin of pronotum concave. Lateral hypomeron approximately as broad as profemora.

Elytra elongate oval, apically slightly truncate; with approximately 14 (10 between suture and shoulder) almost regular rows of not deeply impressed punctures with approximately one puncture diameter between intervals and interstices. Lateral gutter narrow, not reaching apex. Procoxae separated by median carina of prosternum, mesocoxae by approximately half the distance between median and internal carina of mesoventrite, metacoxae by same distance as between median and internal carina of mesoventrite; metaventrite with flat, moderately well

©Wiener Coleopterologenverein (WCV), download unter www.biologiezentrum.at

developed plaques separated by ca. two times width of one plaque, metaventral disc deeply impressed; inflexed lateral portion approximately as broad as mesofemur, not reaching apex.

Aedeagus (Fig. 9a–b): Main piece 340 µm long and slender; in general appearance resembling *H. lagamba*; basal half of main piece more straight, apical third more strongly bisinuous (ventral view), apex wide and truncate; phallobase almost symmetrical. Distal lobe smaller than in the latter species. Left paramere inserted further apical; right paramere slightly shorter than in *H. lagamba*.

Secondary sexual characters: Abdominal segments 7 and 8 of male strongly enlarged, tergite X slightly emarginate apically; lateral margin of male mesotibia slightly curved.

DIFFERENTIAL DIAGNOSIS: This species is very similar to *H. lagamba*, see above for distinguishing characters.

REMARKS: This species was collected in a flight intercept trap.

DISTRIBUTION (Fig. 13): Known only from Costa Rica (Puntarenas Province).

ETYMOLOGY: This species is named after the type locality.

Hydraena (*Hydraenopsis*) *malkini* PERKINS, 1980

Hydraena malkini PERKINS 1980: 196.

DIFFERENTIAL DIAGNOSIS: This species is a member of the *H. marginicollis*-group. It can be clearly distinguished by the shape of the aedeagus. For a detailed description and aedeagus illustration of *H. malkini* consult PERKINS (1980: 196–198, Fig. 60C).

DISTRIBUTION: Costa Rica (Cartago Prov.) (PERKINS 1980) and Nicaragua (DELGADO et al. 1997).

Hydraena (*Hydraenopsis*) *nevermanni* PERKINS, 1980

Hydraena nevermanni PERKINS 1980: 195.

TYPE MATERIAL EXAMINED: **Holotype** ♂ (USNM): "COSTA RICA \ F NEVERMANN \ 23 II 33 \\ HAMBURGFARM \ REVENTAZON \ EBENE LIMON \\ in Schweinesuhle [pig wallow] \\ HOLOTYPE \ Hydraena \ nevermanni \ P. D. Perkins [red label] \\ BLNO \ 003995 [blue label]". **Paratype** ♀ (USNM): "COSTA RICA \ F NEVERMANN \ 23 II 33 \\ HAMBURGFARM \ REVENTAZON \ EBENE LIMON \\ in Schweinesuhle [pig wallow] \\ ALLOTYPE \ Hydraena \ nevermanni \ P. D. Perkins".

DIFFERENTIAL DIAGNOSIS: This species is a member of the *H. marginicollis*-group. It can be clearly distinguished by the shape of the aedeagus. For a detailed description and aedeagus illustration of *H. nevermanni* consult PERKINS (1980: 195–196, Fig. 60B).

DISTRIBUTION: Costa Rica, Limón Province (PERKINS 1980).

Hydraena (*Hydraenopsis*) *pajarita* sp.n.

TYPE LOCALITY: Rincon de Osa, Puntarenas Province, Costa Rica.

TYPE MATERIAL: **Holotype** ♂ (INBio): "COSTA RICA: Punta. Prov. \ Rincon de Osa, 50m \ 8°41.141'N, 83°31.117'W \ 23-26-VI-2001,S.&J.Peck \ 01-13. 3x FIT. CR1P01 005 \\ [barcode] SM0520644 \ KUNMW-ENT".

DESCRIPTION (male): Habitus as in Fig. 4. Body approximately 1.30 mm long.

©Wiener Coleopterologenverein (WCV), download unter www.biologiezentrum.at

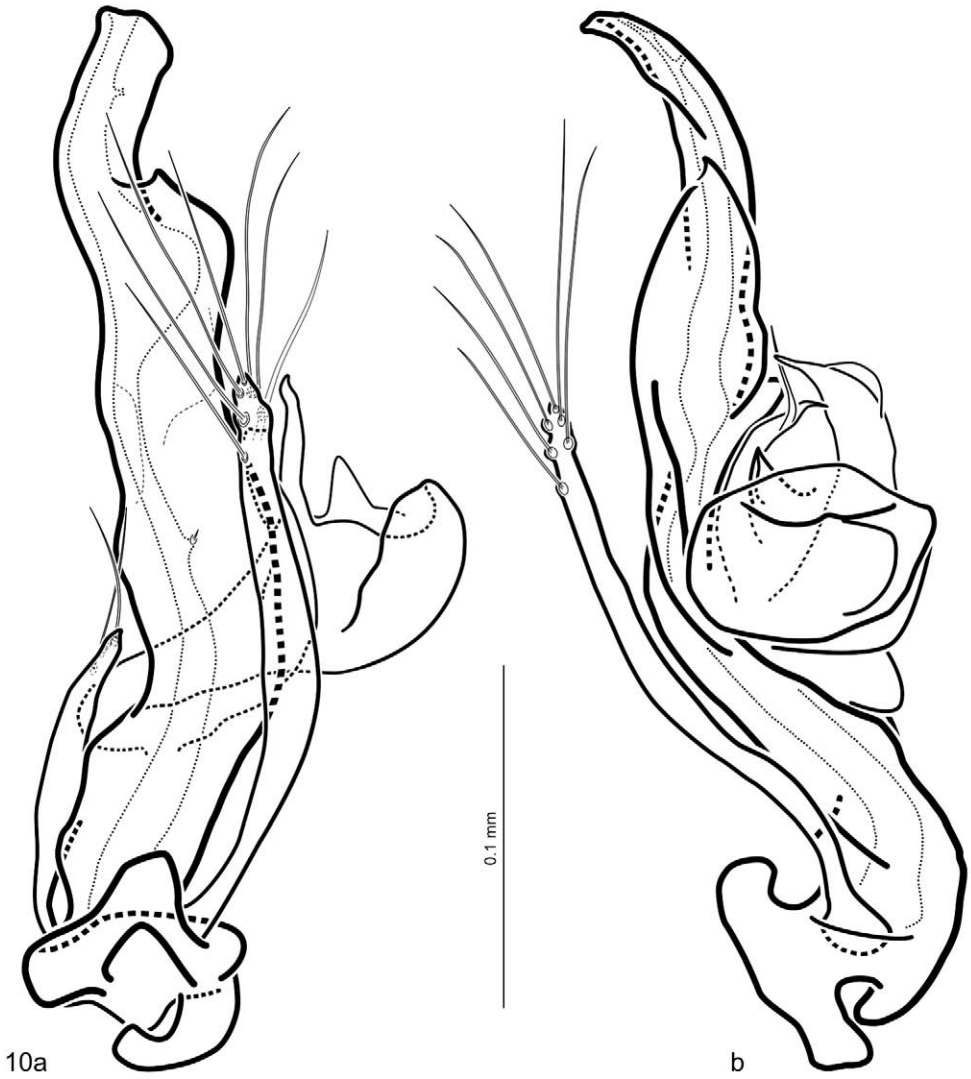


Fig. 10: *Hydraena pajarita*; aedeagus in a) ventral and b) lateral view.

©Wiener Coleopterologenverein (WCV), download unter www.biologiezentrum.at

Colour: Head bicoloured, frons dark brown, labrum paler reddish brown; elytra, pronotum and body appendages (maxillary palpi, antennae and legs) reddish brown; colouration on pronotal disc slightly darker.

Head: Occipital region with stridulatory ridges.

Thorax: Pronotum with shallow anteroexternal foveolae; punctures moderately deeply impressed, separated by approximately one puncture diameter, interstices glabrous. Lateral rim strong and denticulate; anteriorly slightly convergent, posteriorly sinuously convergent. Anterior margin of pronotum strongly concave with protruding stridulatory plectrum in the middle. Lateral hypomeron as broad as profemur.

Elytra elongate oval, conjointly rounded apically; approximately 14 (10 between suture and shoulder) subregular rows of shallowly impressed punctures, 1.0–1.5 puncture diameters between intervals and interstices. Lateral gutter narrow, not reaching apex. Procoxae separated by more than half the distance between median and internal carina of mesoventrite, mesocoxae and metacoxae separated approximately by the same distance as between median and internal carina of mesoventrite; metaventrite with slightly elevated, narrow plaques diverging posteriad, metaventral disc deeply impressed, with furrow and with projection lateral of plaques; inflexed lateral portion approximately as broad as mesofemur, not reaching apex.

Aedeagus (Fig. 10a–b): Main piece 310 µm long and slender, uneven and winding in shape with lateral emarginations, subapically distinctly and abruptly attenuate (ventral view), bearing one tiny seta at mid-length of aedeagus; apex obliquely truncate in ventral view, more pointed and distinctly curved ventrad in lateral view; phallobase subsymmetrical, basal ring not completely closed. Distal lobe originates dorsally in basal 0.3 of aedeagus; tending toward right side; moderately sclerotized, somewhat club-shaped, with several appendages, including a long spur-like structure directed apicad. Parameres slender, articulately connected to main piece, inserted basally; right paramere reaching 0.65 of aedeagal length, with about six long setae in apical area; left paramere distinctly shorter, reaching ca. 0.4 of aedeagal length; bearing 2–5 setae at apex.

Secondary sexual characters: Abdominal segments 7 and 8 of male strongly enlarged, tergite X of male without emargination. Male protibiae curved, proximal portion of inner margin strongly curved, with subterminal projection.

DIFFERENTIAL DIAGNOSIS: The relatively widely separated procoxae and mesocoxae as well as similarities in the aedeagus (main piece long and slender, uneven and winding shape, distal lobe originating in basal half, parameres inserted basally) suggest a close relationship with some Mexican species placed in the *H. marginicollis*-group, *H. geminya*-subgroup (sensu PERKINS 1980). However, the presence of an occipital-pronotal stridulatory apparatus is a character hitherto not recorded from the *H. marginicollis*-group. Externally, *H. pajarita* superficially resembles *H. esquinita* – for distinguishing characters see the respective 'Differential Diagnosis'.

REMARKS: This species was found in a flight intercept trap.

DISTRIBUTION (Fig. 13): Known only from type locality (Costa Rica, Puntarenas Prov.).

ETYMOLOGY: The name of this species derives from the Spanish word for little bird (pajarito) because of the shape of the distal lobe of the aedeagus resembles a nest with little birds inside.

***Hydraena* (*Hydraenopsis*) *pilimera* sp.n.**

TYPE LOCALITY: Pools in grassy cattle field, near Tapantí National Park, Cartago Province, Costa Rica.

©Wiener Coleopterologenverein (WCV), download unter www.biologiezentrum.at

TYPE MATERIAL: **Holotype** ♂ (INBio): "COSTA RICA: Cartago, 1.5 km \ before Tapanti National \ Park, pasture between road and rio Orosi (9°45'N / 83°47'), 10 i 2005, coll. \ AEZShort, AS-05-142". **Paratypes:** 2 ♂♂, 3 ♀♀ (INBio, NMW, USNM): same data as holotype; 1 ♂, 1 ♀ (INBio): "COSTA RICA: Cartago, \ Tapanti National Park, \ various places along \ entrance road and trail, 8 i \ 2005, coll. Joshua J. Hannam"; 28 ♂♂, 17 ♀♀ (INBio, NMW, USNM): "Costa Rica: Cargato Prov. \ Tapanti National Park \ Pipeline crossing \ 16.vii.2011, leg. A. Short & \ J. Unseld (CR11-0716-01B)"; 4 ♂♂, 1 ♀ (USNM): "Costa Rica: Cargato Prov. \ Tapanti National Park \ 9.69099° N, 83.76162° W \ 1673 m, 16.vii.2011 \ leg. A. Short & J. Unseld \ (CR11-0716-02C)"; 1 ♂, 1 ♀ (USNM): "Costa Rica: Cargato Prov. \ Tapanti National Park \ Oropendola trail \ 17.vii.2011, leg. A. Short \ (CR11-0717-01A)".

DESCRIPTION: Habitus as in Fig. 5. Body approximately 1.80–2.00 mm long.

Colour: Head (frons and labrum) dark brown; body appendages (maxillary palpi, antennae and legs) brown; pronotal disc and elytra brown, pronotal margins slightly paler than pronotal disc.

Thorax: Pronotum with distinct anteroexternal foveolae; punctures moderately deeply impressed, punctation on pronotal disc sparser (separated by 1–2 puncture diameters) than towards margins (separated by less than one puncture diameter), interstices glabrous. Lateral rim distinctly denticulate, anteriorly slightly arcuate, posteriorly sinuously convergent. Anterior margin of pronotum concave. Lateral hypomeron approximately as broad as profemur.

Elytra elongate oval, apically slightly tapered, not conjointly rounded; with 14–15 (10 between suture and shoulder) regular rows of moderately impressed punctures with approximately one puncture diameter between intervals and interstices. Lateral gutter moderately broad, not reaching apex. Procoxae separated by median carina of prosternum, mesocoxae in most specimens separated by less than half the distance between median and internal carina of mesoventrite, distance between metacoxae wider than distance of median and internal carina of mesoventrite; metaventrite with flat elongate plaques (in some specimens inconspicuous) diverging posteriad (anteriorly separated by plaque width, posteriorly separated by three times plaque width), metaventral disc slightly impressed in male, more distinctly impressed in female; inflexed lateral portion of elytra approximately as broad as mesofemur, not reaching apex.

Aedeagus (Fig. 11a–b): Main piece 415 µm long, stout, basal portion rather straight in lateral view, strongly curved basally in ventral view, apical portion inclined to the right with apex rounded (ventral view), inclined to the left with apex pointed (lateral view); dorsal margin with two setae at apical 0.2; phallobase symmetrical. Distal lobe intricately shaped, not strongly sclerotized, emerging distal of middle of main piece, exceeding main piece. Parameres distinctly dissimilar; right paramere rather simple, slender; articulately connected to main piece at about basal 0.45 of aedeagal length, reaching about 0.7 of aedeagus, latero-apically bearing ca. 13 moderately long setae; left paramere very long, exceeding main piece by almost 1/3 of length, inserted at middle of main piece, apically hyaline, lateral part pilose, bearing ca. 16 setae baso-laterally arranged in groups of 3, 1, 3, and 2 and followed by a formation of seven setae ventrally extending across the paramere at about half length.

Gonocoxite (Fig. 11c) subhexagonal, without condyles, strongly attenuate basally, apical margin slightly emarginate between tufts, disc with tiny setae, apical and basal area clearly delimited, apical area laterally with a few longer setae, cavea subpentagonal, apically emarginate.

Spermatheca as in Fig. 11d–e.

Secondary sexual characters: Male protibia slightly expanded in apical half, carina of mesal face slightly curved, covered with short bristles. Abdominal segments 7 and 8 of male strongly enlarged, male tergite X strongly emarginate apically.

Female tergite X (Fig. 11f) transverse, subsemicircular, basal margin weakly bisinuous, apical margin inconspicuously serrate; disc with very few trichoid setae; subapical fringe with vermiform, apically bluntly hooked setae.

©Wiener Coleopterologenverein (WCV), download unter www.biologiezentrum.at

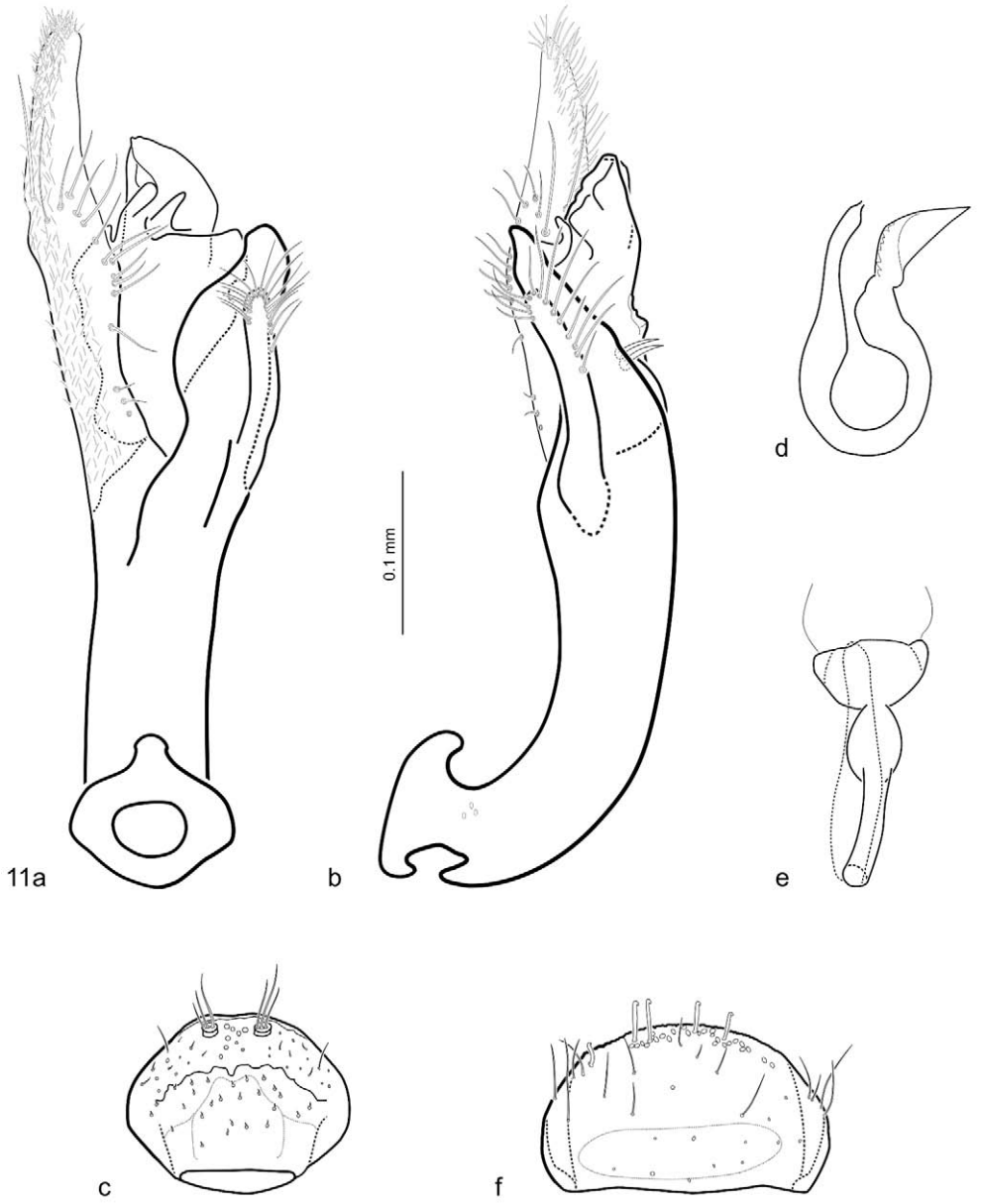


Fig. 11: *Hydraena pilimera*: a–b) aedeagus in ventral and lateral view; c) gonocoxite; d–e) spermatheca; f) female tergite X.

©Wiener Coleopterologenverein (WCV), download unter www.biologiezentrum.at

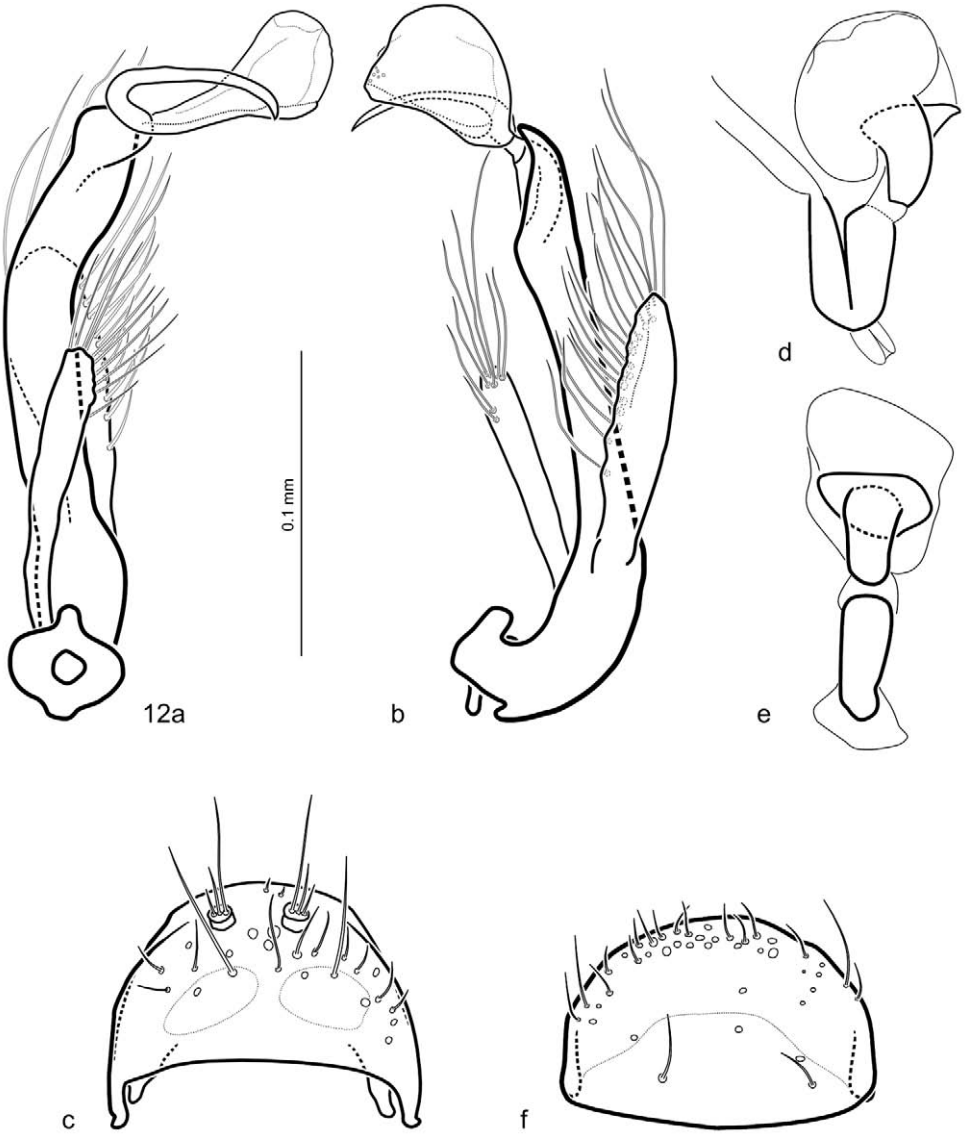


Fig. 12: *Hydraena sanagergelyae*: a–b) aedeagus in ventral and lateral view; c) gonocoxite; d–e) spermatheca; f) female tergite X.

©Wiener Coleopterologenverein (WCV), download unter www.biologiezentrum.at

DIFFERENTIAL DIAGNOSIS: The aedeagus of *H. pilimera* is most similar to *H. barricula* PERKINS, 1980, *H. d-destina* PERKINS, 1980 and *H. splecoma* PERKINS, 1980, all known from Mexico. From these three species as well as from all Costa Rican ones *H. pilimera* can be clearly distinguished by the left paramere exceeding the main piece. *Hydraena pilimera* is clearly larger than all other Costa Rican species of *Hydraenopsis*.

ECOLOGY: *Hydraena pilimera* was collected in small shallow, vegetation filled pools in a grassy cattle field.

DISTRIBUTION (Fig. 13): Costa Rica (Cartago Prov.).

ETYMOLOGY: Named for the conspicuous left paramere. 'Pilimera' is the shortened term for 'pilose paramere'.

Hydraena (*Hydraenopsis*) *pontequula* PERKINS, 1980

Hydraena pontequula PERKINS 1980: 198.

TYPE MATERIAL EXAMINED: **Holotype** ♂ (USNM): "PANAMA,C.Z. \ AlbrookForestSite \ ground,20-I-1968 \ R.S. Hutton \\ HOLOTYPE \ Hydraena \ pontequula \ P.D. Perkins [red label] \\ BLNO 004006 [blue label]"; **Paratypes:** 1 ♀ (USNM): "PANAMA,C.Z. \ AlbrookForestSite \ ground,20-I-1968 \ R.S. Hutton \\ ALLOTYPE \ Hydraena \ pontequula \ P.D. Perkins"; 1 ♂ (NMW) "PANAMA, C.Z. \ AlbrookForestSite \ ground, 20-I-1968 \ R.S. Hutton \\ PARATYPE \ Hydraena \ pontequula".

ADDITIONAL MATERIAL EXAMINED:

COSTA RICA: Punatrenas Prov.: 10 ♂♂ (INBio, NMW): "CR: Prov. Puntarenas (CR4) \ Qu.[ebrada] Negra, ca. 8 km NW Golfito \ nr. La Gamba (vill.), at Field Station \ La Gamba, 90 m a.s.l. \ 8°42'06"N / 83°12'07"W \ 1.-3.3.09, leg. M. Brojer".

DIFFERENTIAL DIAGNOSIS: See 'Differential Diagnosis' of *H. lagamba*. For a detailed description and aedeagus illustration consult PERKINS (1980: 198–199, Fig. 60D).

REMARKS: *Hydraena pontequula* was collected at the sandy to gravelly margin of Quebrada Negra together with *H. lagamba*, *H. sanagergelyae*, and *H. turrialba*.

DISTRIBUTION: Panama (PERKINS 1980), Costa Rica (Puntarenas Prov.) (first record).

Hydraena (*Hydraenopsis*) *sanagergelyae* sp.n.

TYPE LOCALITY: Río Cataratas, SE Los Lagos village, at Ramón – Fortuna Road, Alajuela Province, Costa Rica.

TYPE MATERIAL: **Holotype** ♂ (NMW): "CR: Prov. Alajuela (CR24) \ Río Cataratas, ca. 770 m a.s.l. \ SE Los Lagos \ at San Ramón-Fortuna Road \ 10°13'04"N / 84°32'41"W \ 29.3.09, leg. M. Brojer". **Paratypes**: 1 ♂, 6 ♀♀ (INBio, NMW): same data as holotype; 2 ♂♂ (NMW): "CR: Prov. Puntarenas (CR4) \ Qu.[ebrada] Negra, ca. 8 km NW Golfito \ nr. La Gamba (vill.), at Field Station \ La Gamba, 90 m a.s.l. \ 8°42'06"N / 83°12'07"W \ 1.-3.3.09, leg. M. Brojer"; 2 ♂♂, 12 ♀♀ (INBio, NMW): "CR: Prov. San Jose (CR16c) \ NP Braulio Carillo \ Qu.[ebrada] Gonzalez, ca. 560 m a.s.l. \ 10°09'41"N / 83°56'07"W \ 20.3.09, leg. M. Brojer \\ ca. 2.6 km O [east of] Qu.[ebrada] Gonzalez \ Ranger Station \ ditch beside river".

DESCRIPTION: Habitus as in Fig. 6. Body approximately 1.10–1.30 mm long.

Colour: Head (frons and labrum) dark brown to black; pronotum entirely testaceous; body appendages (maxillary palpi, antennae and legs) testaceous. Elytra dark brown with a large postmedian paler macula.

Thorax: Pronotum with hardly perceptible anteroexternal foveolae; punctures especially on pronotal disc very fine and shallow; interstices glabrous. Lateral rim denticulate and more conspicuous in posterior half; anterior portion of lateral margins almost parallel-sided;

©Wiener Coleopterologenverein (WCV), download unter www.biologiezentrum.at

posteriorly slightly sinuously convergent; anterior margin of pronotum slightly concave. Lateral hypomeron broader than profemur.

Elytra oval and slightly tapered apically, approximately 14 (10 between suture and shoulder) not very regular rows of not deeply impressed punctures with approximately one puncture diameter between intervals and interstices. Lateral gutter of elytra narrow, not reaching apex. Procoxae separated by ca. half the distance between median and internal carina of mesoventrite, mesocoxae separated by approximately same distance as between median and internal carina of mesoventrite, metacoxae separated by greater distance than between median and internal carina of mesoventrite; metaventrite with flat and very indistinctly developed plaques separated by 3–4 times width of one plaque; metaventral disc rather deeply impressed; inflexed lateral portion of elytra approximately as broad as mesofemur, not reaching apex.

Aedeagus (Fig. 12a–b): Main piece 200 μm long and slender, rather straight in lateral view and pointed at apex; crooked to the left in apical third in ventral view; phallobase almost symmetrical. Distal lobe very loosely attached to main piece, club-shaped, very thin at base, branching into a curved spur-like sclerotized part and a lobed hyaline process. Parameres articulately connected to main piece; left paramere inserted basally, slender, reaching basal 0.6 of main piece, very slightly and gradually widening toward apex, bearing ca. eight long setae on inner face of apex; right paramere inserted approximately at basal 0.25, elongate oval, reaching basal 0.8 of main piece, bearing ca. 17 long setae on ventral margin between basal 0.3 and apex.

Gonocoxite (Fig. 12c) longer than wide; basal margin slightly concave, apical margin slightly rounded, lateral margin slightly offset before apex, apical and basal area not delimited, basal half more or less without bristles, apical half with about 12 short to long setae; each apical tuft with three setae, one of which is very long; condyles strongly projecting; basal margin of dorsal plate strongly concave, condyles exposed, cavea paired.

Spermatheca as in Fig. 12d–e.

Secondary sexual characters: Abdominal segments 7 and 8 of male hardly enlarged, male tergite X with weak apical emargination. Females on average larger (1.18 mm female, 1.11 mm male).

Female tergite X (Fig. 12f) subpentagonal, transverse, basal margin slightly convex, lateral margins rather straight, apical margin evenly convex; disc with only very few setae, subapical fringe with short trichoid setae, lateral ones longer.

DIFFERENTIAL DIAGNOSIS: This species is characterized by the entirely testaceous pronotum, the pale macula on the dark brown elytra, and the relatively small size.

On account of external and aedeagal characters, *H. sanagergelyae* seems to be closely related with *H. newtoni* PERKINS, 1980 and *H. limpidicollis* PERKINS, 1980 from Panama (both associated to the *H. marginicollis*-subgroup, *H. mexicana*-complex). *Hydraena sanagergelyae* can be clearly distinguished from these species by the slender main piece (ventral view), by the comparatively large elongate oval right paramere and the shape of the distal lobe.

Unidentified females collected in Braulio Carillo NP (32 exs., leg. Brojer, NMW) can be distinguished from *H. sanagergelyae* by the hardly apparent elytral macula and by the gonocoxite: distance between subapical tufts shorter, condyles more prominent, cavea impaired.

DISTRIBUTION (Fig. 13): Costa Rica (Alajuela Prov., Puntarenas Prov., San José Prov.).

ECOLOGY: *Hydraena sanagergelyae* was collected at sandy to fine gravelly margins of brooks and residual ditches. At Río Cataratas also *H. brevis* was collected, although in a different microhabitat (see below, under 'Discussion'). At La Gamba Field Station (Puntarenas Prov.), *H. sanagergelyae* was found together with *H. lagamba*, *H. pontequula* and *H. turrialba*. In the

©Wiener Coleopterologenverein (WCV), download unter www.biologiezentrum.at

Braulio Carillo NP, *H. sanagergelyae* was collected together with females of another, quite similar, unidentified species.

ETYMOLOGY: This species is dedicated to Sana Gergely (Austria).

Hydraena (*Hydraenopsis*) *turrialba* PERKINS, 1980

Hydraena turrialba PERKINS 1980: 186.

TYPE MATERIAL EXAMINED: **Holotype** ♂ (USNM): "COSTA RICA \ Turrialba \ VII-15-19-65 \ P.J.Spangler \\ HOLOTYPE \ Hydraena \ turrialba \ P.D. Perkins [red label] \\ BLNO 004017 [blue label]". **Paratype** ♀ (USNM): COSTA RICA \ Turrialba \ VII-15-19-65 \ P.J.Spangler \\ ALLOTYPE \ Hydraena \ turrialba \ P.D. Perkins".

ADDITIONAL MATERIAL EXAMINED:

COSTA RICA: Punatrenas Prov.: 2 ♂♂ (NMW): "CR: Prov. Puntarenas (CR4) \ Qu.[ebrada] Negra, ca. 8 km NW Golfito \ nr. La Gamba (vill.), at Field Station \ La Gamba, 90 m a.s.l. \ 8°42'06"N / 83°12'0"W \ 1.-3.3.09, leg. M. Brojer".

DIFFERENTIAL DIAGNOSIS: This species is a member of the *H. marginicollis*-group. It can be clearly identified by the shape of the aedeagus. For a detailed description and aedeagus illustration consult PERKINS (1980: 186–187, Fig. 55B).

DISTRIBUTION: This species was described from Costa Rica (Cartago Prov.) (PERKINS 1980). It is here reported from Puntarenas Province for the first time.

ECOLOGY: *Hydraena turrialba* was collected at the sandy to gravelly margin of Quebrada Negra together with *H. lagamba*, *H. pontequula*, and *H. sanagergelyae*.

Ochthebius (s.str.) *mesoamericanus* PERKINS, 1980

Ochthebius (s.str.) *mesoamericanus* PERKINS 1980: 373.

MATERIAL EXAMINED:

COSTA RICA: Cartago Prov.: 62 exs. (INBio, NMW): "CR: Prov. Cartago (CR14b) \ Río Tuis (gravel riv. bank) \ ca. 7.8 km SE Turrialba \ nr. Canada (vill.), ca. 619 m a.s.l. \ 9°51'37"N / 83°37'33"W \ 15. + 16.3.2009, leg. M. Brojer".

For a detailed description and aedeagus illustration see PERKINS (1980: 373–374, Fig. 129A–C).

REMARKS: This species is a member of the *Ochthebius marinus*-group.

PERKINS (1980) pointed out the considerable geographical variation of the aedeagus. Further taxonomic research might reveal a complex of different species.

DISTRIBUTION: Guatemala, Mexico (PERKINS 1980), Costa Rica (first record).

ECOLOGY: *Ochthebius mesoamericanus* is psammophilous. Specimens collected by the first author were taken at low flow along the margin of a sand-gravel-bank.

Discussion

Most of the Costa Rican species examined were collected at margins of creeks, brooks, small rivers as well as in residual ditches. They were found mainly in sandy or gravelly substrate, pockets of leaves, and debris. Some species also have been encountered in muddy pools of pastural farmland (*H. pilimera*) or in a pig wallow (*H. nevermanni*).

In contrast, *H. brevis* was mainly encountered in packs of leaves and twigs, which had become trapped behind stones in riffles and cascades of rapid streams (see also PERKINS 1980).

©Wiener Coleopterologenverein (WCV), download unter www.biologiezentrum.at

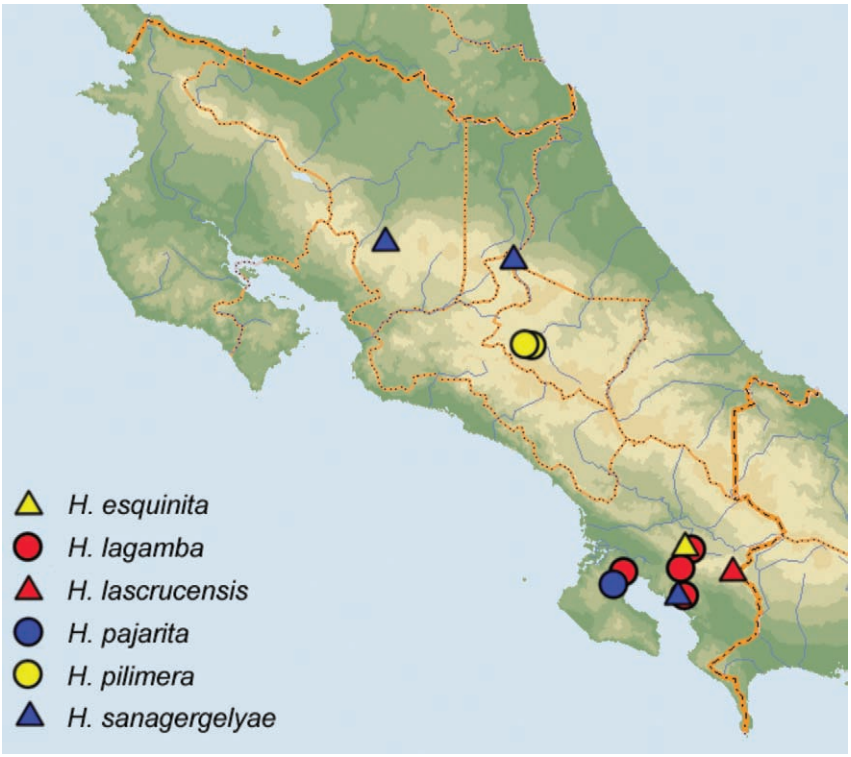


Fig: 13: Distribution of the newly described species in Costa Rica.

Two species, *H. lascrucensis* and *H. pajarita*, were so far collected only from flight intercept traps.

In this paper the number of species of Hydraenidae known to occur in Costa Rica is raised from six to 15. They belong to three genera: *Gymnochthebius*, *Hydraena* and *Ochthebius*. The genus *Limnebius*, known from Mexico and Guatemala, has not yet been reported from Costa Rica so far.

The presence of 90 unidentifiable females of *Hydraenopsis* collected from five localities (CR4, CR9, CR14c, CR16c, CR23) by the first author suggest, that there are in fact more species (either described ones recorded from other Central American countries, or undescribed ones) occurring in Costa Rica.

An unidentified species, closely related with *Hydraena brevis*, was collected in 1995 by T. Goldschmidt in the Cartago Province near Río Macho (1 ♀, NMW).

©Wiener Coleopterologenverein (WCV), download unter www.biologiezentrum.at

Figs. 14–15: Habitat photographs: 14) type locality of *Hydraena esquinita* (Quebrada Esquinas, Puntarenas Province, Costa Rica; detail shows residual ditch at margin of stream with clay sediment where the specimen was collected); 15) type locality of *Hydraena lagamba* (Quebrada Negra, Puntarenas Province, Costa Rica).

©Wiener Coleopterologenverein (WCV), download unter www.biologiezentrum.at

Acknowledgements

Max Barclay (BMNH) and Gary Hevel (USNM) are thanked for the loan of type specimens, as well as Philip D. Perkins (MCZ) for providing new material from Costa Rica and material for comparison. Further specimens were made available by Tom Goldschmidt (München) and Andrew Short (SEMC).

In addition, Fritz Schiemer and Anton Weissenhofer (University of Vienna) are thanked for sharing their knowledge about the area around La Gamba Field Station during an excursion in 2009, in which the first author took part.

Christian Hahn-Gergely (Wien) is thanked for financial support of the Costa Rica-Project of the first author.

References

DELGADO, J.A., COLLANTES, F. & SOLER, A.G. 1997: Distribution and life cycle of three species of *Hydraena* in Nicaragua (Coleoptera: Hydraenidae). – Revista de Biología Tropical 44–45: 645–649.

JÄCH, M.A., BEUTEL, R.G., DELGADO, J.A. & DÍAZ, J.A. 2005: 11.1. Hydraenidae Mulsant, 1844, pp. 224–251. – In Beutel, R.G. & Leschen, R.A.B. (eds.): Handbook of Zoology, Volume IV (Part 38), Coleoptera, Beetles, Volume 1: Morphology and Systematics (Archostemata, Adephaga, Myxophaga, Polyphaga partim). – Berlin/New York: Walter de Gruyter, xi+567 pp.

PERKINS, P.D. 1980: Aquatic beetles of the family Hydraenidae in the Western Hemisphere: Classification, biogeography and inferred phylogeny (Insecta: Coleoptera). – Quaestiones Entomologicae 16: 3–554.

PERKINS, P.D. 1997: Life on the effective bubble: exocrine secretion delivery systems (ESDS) and the evolution and classification of beetles in the family Hydraenidae (Insecta: Coleoptera). – Annals of Carnegie Museum 66 (2): 89–207.

SHARP, D. 1882: Insecta. Coleoptera. Vol. 1, part 2 (Haliplidae, Dytiscidae, Gyrinidae, Hydrophilidae, Heteroceridae, Parnidae, Georissidae, Cyathoceridae, Staphylinidae). – In Godman, F.D. & Salvin, O. (eds.): Biologia Centrali-Americana (16). – London: Taylor and Francis, xv+824 pp.

SPRINGER, M. 2008: Aquatic insect diversity of Costa Rica: state of knowledge. – Revista de Biología Tropical 56 (Suppl. 4): 273–295.

Mag.[a] Michaela BROJER & Dr. Manfred A. JÄCH
Naturhistorisches Museum, Burgring 7, A – 1010 Wien, Austria (michaela.brojer@nhm-wien.ac.at, manfred.jaech@nhm-wien.ac.at)

ZOBODAT - www.zobodat.at

Zoologisch-Botanische Datenbank/Zoological-Botanical Database

Digitale Literatur/Digital Literature

Zeitschrift/Journal: Koleopterologische Rundschau

Jahr/Year: 2011

Band/Volume: 81_2011

Autor(en)/Author(s): Brojer Michaela, Jäch Manfred A.

Artikel/Article: Update on the hydraenid fauna of Costa Rica, with descriptions of six new species (Coleoptera: Hydraenidae). 69-92