Zootaxa 3168: 64–68 (2012)
www.mapress.com/zootaxa/

Article

ISSN 1175-5326 (print edition)
ZOOTAXA
ISSN 1175-5334 (online edition)

Redescription and lectotype designation of *Helichus cordubensis* Berg (Coleoptera: Dryopidae)

G. A. RODRIGUEZ [1] & V. MANZO[2]

[1]*Facultad de Ciencias Naturales e I.M.L, Universidad Nacional de Tucumán, Miguel Lillo 205, 4000. Tucumán, Argentina. E-mail: gialro@gmail.com*

[2]*CONICET – Facultad de Ciencias Naturales e I.M.L, Universidad Nacional de Tucumán, Miguel Lillo 205, 4000. Tucumán, Argentina. E-mail: veromanzo@yahoo.com.ar*

Abstract

Helichus cordubensis Berg, 1885 is redescribed based on type material and new material. A lectotype is designated for this species. Male genitalia are illustrated for the first time.

Key words: aquatic beetles, *Helichus*, South America, Argentina

Introduction

Dryopidae is a common, widespread family of beetles. Currently 33 genera with about 280 species have been described. Dryopids are more abundant and diverse in the humid tropics of the Neotropical, Afrotropical and Oriental regions. The Palearctic and Nearctic regions are less diverse, and only a few species are known from the Australian region (Kodada & Jäch, 2005). This family, although relatively small in terms of the number of recognized species, is rather diverse ecologically, having humicolous, arboreal, semi-aquatic and aquatic members (Perkins, 1997). Seventy-two species have been described from the Neotropical region in the following 13 genera: *Dryops*, *Elmoparnus*, *Helichus*, *Onopelmus*, *Pelonomus*, *Parygrus*, *Guaranius*, *Quadryops*, *Ghiselinius*, *Momentum*, *Holcodryops*, *Sostea* and *Sosteamorphus* (Kodada & Jäch, 2005).

Erichson (1847) erected the genus *Helichus* for the Nearctic species *Elmis lithophilus* described by Germar (1824) from Canada. Since that time many species have been named and assigned to *Helichus*. Nelson (1989), after examining specimens of *Helichus* from many regions, discovered that most of the species belong to other genera, mostly undescribed. Hinton (1935), in his paper on North American *Helichus*, recognized two species–groups: the "*lithophilus*-group" and the "*productus*-group", based on the type of pubescence of the last ventrite and on the form of the ovipositor. Nelson (1989) transferred all species included in the *productus*-group to the new genus *Postelichus* while he kept the species in the *lithophilus*-group in the *Helichus* Erichson. The known distribution of *Postelichus* Nelson, 1989 is the southwestern United States and Mexico.

Helichus is found throughout the Oriental, Nearctic and Neotropical regions. At present nine species have been reported from the Neotropical region (Kodada & Jäch 2005), most of them described at the end of the 19th and beginning of the 20th century (Sharp, 1882; Berg, 1885; Grouvelle, 1896; Hinton, 1937 and 1939) when the generic concepts of *Helichus* and *Dryops* were confused. The Neotropical species of *Helichus* need to be reviewed; many species appear to belong to genera other than the one in which they were described (Shepard, personal communication).

Helichus cordubensis was described by Berg (1885) from Argentina (Córdoba province). No additional species of the genus have been recorded or described from Argentina. *H. cordubensis* has never been redescribed, and there are only distributional records from Argentina and Paraguay (Corigliano & Raffaini 2001; Oberto *et al*. 2004; Corigliano *et al*. 2005; Tripole & Corigliano 2005, Fernández *et al*. 2008; Shepard & Aguilar Julio 2010).
In this paper we redescribe *H. cordubensis* Berg because the original description was incomplete, and in particular lacked a description of the male genitalia. Thus, this species is unambiguously diagnosed and redescribed based on

 Accepted by P. Perkins: 23 Nov. 2011; published: 23 Jan. 2012

type material, earlier published data and new material. A lectotype is designated; the male genitalia are illustrated for the first time and new distributional records are included.

Material and methods

Types specimens (two) and material identified as *Helichus cordubensis* were borrowed from Museo de Ciencias Naturales "Bernardino Rivadavia" (MACN), Buenos Aires, Argentina. Label data for primary types are cited in full. Labels are cited with original spelling, punctuation and date. Additional information is included in square brackets.

The new material studied came from four different Argentine provinces: Salta, Tucumán, Catamarca and Córdoba. All of the material was deposited in the collection of the Instituto-Fundación Miguel Lillo, Tucumán, Argentina. Newly collected specimens were fixed in the field and stored in 75% ethyl alcohol. Some specimens were dissected to examine and illustrate the male genitalia. Male genitalia of this species were cleared with concentrated lactic acid for several days before examination. Drawings were done with an Olympus BH-2 microscope and a Leica Wild M3Z stereomicroscope, both with camera lucida.

The morphological nomenclature follows Hinton (1939) and Nelson (1989).

Results

According to Nelson (1989) *Helichus* can be distinguished from all other known Dryopidae genera by the following combination of characters: 1) maxillary palp with subapical sensory pit open, usually rounded or ovoid; 2) only first two visible ventrites fused internally; 3) last visible ventrite much less densely pubescent than the preceding four, not tomentose; 4) ventral surface more densely and conspicuously granulate than dorsal surface; 5) male genitalia: parameres without expanded apical process and median lobe without prominent membranous side walls and with small or no median sclerite; 6) female ovipositor with well developed apical and basal pieces, the latter usually broadly fused across the midline, the former flattened, more or less elongate and acuminate to apex; 7) fertilization chamber and orifice of median oviduct without bristles and 8) eggs distinctly elongate, two to three times as long as wide.

Helichus cordubensis Berg, 1885

Ann. Soc. Cient. Arg. *Helichus cordubensis* Berg, 1885: 224;
Ecol. Aguas Cont. *H. cordubensis* Trémouilles *et al.*, 1995: 1171;
Rev. Soc. Entomol. Argent. *H. cordubensis* Corigliano & Raffaini, 2001: 190;
Act. Limnol. Bras. *H. cordubensis* Oberto *et al*., 2004: 179;
Act. Limnol. Bras. *H. cordubensis* Tripole & Corigliano, 2005: 108;
Rev. Univ. Nac. Río Cuarto. *H. cordubensis* Corigliano *et al*., 2005: 134.
Bol. Mus. Nac. Hist. Parag. *H. cordubensis* Shepard & Aguilar Julio, 2010: 32.

Diagnosis. This species may be distinguished from all other known *Helichus* species by the following combination of characters: 1) punctures of the middle and posterior region of disc of pronotum larger than facet of eyes, separated by 0.5 their diameter or less; 2) surface of scutellum sparsely punctate, punctures smaller than facet of eyes, separated by three times their diameter, with dispersed setae; 3) aedeagus long and tubular; penis elongate, slender apically with basolateral apophyses short and wide, symmetrical; fibula long and weakly sclerotized; parameres distinctly shorter than phallobasis; phallobasis long, partially open in dorsal view, with basal orifice asymmetrical.

Redescription. *Male*: body form and size: elongated, moderately convex; surface densely pubescent. Length 4.85 mm; greatest width 2.15 mm (at 1/3 length of elytra).

Color: cuticle weakly shining; dorsal and ventral surface reddish brown, except for pronotum dark brown and distal five antennomeres reddish.

Tomentum: covering lateral areas of pronotum, elytra, epipleura, sides of prosternum, hypomeron, sides of meso- and metaventrites, all coxae and femora, and abdominal ventrites I–IV.

Head: partially retractable, surface microreticulate, with short golden sparse setae. Clypeus broad, lateral area convex with a tuft of long golden hair-like setae. Labrum subrectangular, emarginate apicomedially; surface with long golden setae from the middle third to the anterior margin. Antennae 8-segmented, second segment enlarged and heavily sclerotized, forming a shield beneath which remaining segments may be retracted; bases of antennae widely separated. Eyes glabrous.

Thorax: pronotum broader than long (1.65 and 1.25 mm), moderately convex; lateral margins subparallel; anterior margin straight; anterolateral angles moderately acute. Base trisinuate. Surface densely punctuate with sparse golden setae; discal area with two sizes of round punctures: anterior third with punctures as wide as facets of eyes, separated by 1–1.5 times their diameter; posterior two thirds with punctures larger than facets of eyes, separated by ½ their diameter or less. Surface between disc and lateral margin with granules as wide as facets of eyes, separated by 1–1.5 times their diameter. Prosternum long, anterior to procoxae; surface shiny, densely punctuate, punctures as wide as facets of eyes, separated by 1–1.5 times their diameter, with short sparse setae; with a lateral long tuft of golden setae on each procoxa. Prosternal process as wide as procoxae, apex acute V-shaped. Hypomeron without tomentum; surface with large oblong granules densely distributed. Mesoventrite with a groove for reception of prosternal process. Metaventrite: disk without lateral carinae; surface with punctures like those on prosternum and sparse short setae; median longitudinal line complete, with a long tuft of golden setae posterior to each mesocoxa. Lateral area with granules like those on hypomeron. Complete transverse line on posterior third of metaventrite.

Legs: coxae, trochanters, tibiae and femora with golden short setae densely distributed; tarsi with short sparse setae, densely punctuate. Pro- and metacoxa transverse; mesocoxa globular. Pro- and mesotrochanter subtriangular; metatrochanter globular. Femora shorter than tibiae, dilated medially. Tibiae with a single short apicolateral cleaning fringe. Tarsi 5-segmented, with short setae on ventral surface; fifth segment longest. Tarsal claws long.

Elytra: length 3.60 mm; greatest width 2.15 mm; surface pubescent. Each elytron with three striae formed by deep, round punctures, punctures separated by ½ their diameter; lateral striae incomplete. Lateral area of each elytron with oblong granules densely distributed. Intervals microreticulated, moderately convex. Epipleuron granulated. Apices protruded and acute. Scutellum flat, broader than long; surface with small sparse punctures, punctures smaller than facet of eyes, separated by three times their diameter, with sparse setae.

Abdomen : surface of ventrites I-IV with oblong granules densely distributed; ventrite V without granules, with punctures, punctures as wide as facets of eyes, separated by 1–1.5 times their diameter, apex with long, golden setae.

Male genitalia: aedeagus (Fig 1, 2) long and tubular. Penis elongate, slender apically (narrower towards apex), with basolateral apophyses short and wide, symmetrical; fibula long and weakly sclerotized. Parameres distinctly shorter than phallobase, subtriangular, apices rounded. Phallobase long, partially open in dorsal view, with basal orifice asymmetrical.

Type material (2 specimens): LECTOTYPE male (here designated), with the following labels: “Typus”; “Cordoba”; “*Helichus cordubensis* 1885 Berg”; “Col. Antigua”; “*Hylichus* Erichs.”; “*Helichus cordubensis* Berg 1885 Syntypi”. Deposited in MACN.

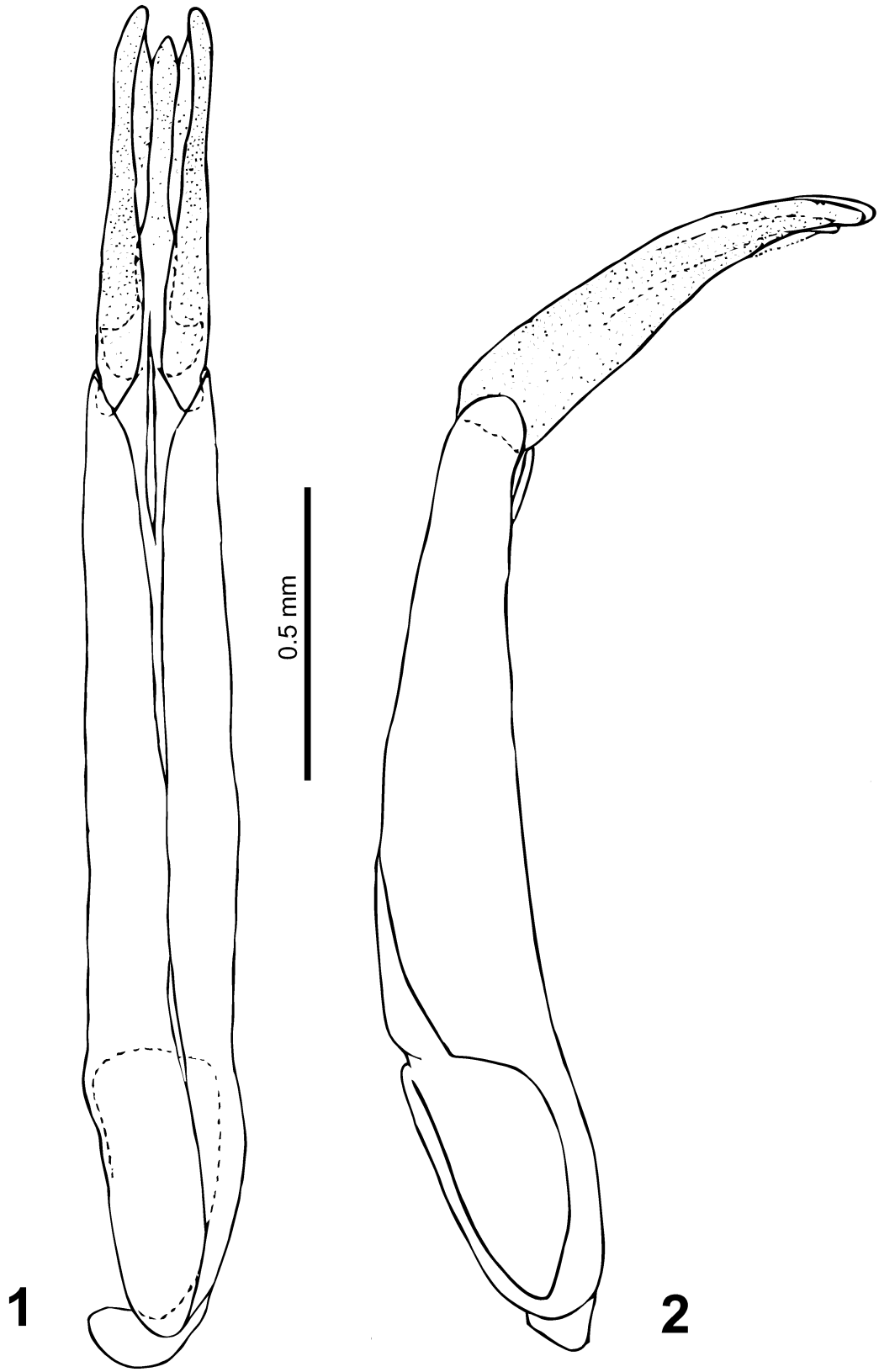
Body length 4.88 mm, greatest width 1.95 mm (at 1/3 length of elytra); pronotum broader than long: 1.48 mm and 1.10 mm; elytra: length 3.46 mm; greatest width 1.95 mm. Lectotype not dissected.

LECTOPARATYPE (here designated) with the same labels as Lectotype. [The head and prothorax are missing].

Elytra length: 3.66 mm, greatest width 2.05 mm. Deposited in MACN.

Type locality. “Cordoba” [Cordoba province, Argentina] (Berg, 1885)

Additional material examined. 5 specimens (1♂ dissected) with the following labels: "Alta Gracia. La Granja. Sierra de Córdoba. 23. XI.23. C. Bruch leg.” “*Helichus cordubensis* Berg C. BRUCH DETERM.” "en agua" MACN and 3 ♂ from Tucumán Province, Burruyacu, Medina River S 26° 32’ 29” W 65° 01’ 42”, 740 m, 14/IV/1999, Fernández, Romero & Manzo cols.



FIGURES 1–2. *Helichus cordubensis*: 1, male genitalia, ventral view; 2, lateral view of same. Locality of specimen used for the illustration: "Alta Gracia, La Granja. Sierra de Córdoba, Cordoba province, Argentina".

The new records *for H. cordubensis* from Argentina are:

Salta Province: A° La Sala (sendero de los ocultos), S 24° 43' 33" W 64° 38' 36", 1000 m, 24/III/1999, Fernández & Romero cols.

Tucumán Province: Burruyacu: Medina River S 26° 32' 29" W 65° 01' 42", 740 m, 14/IV/1999, Fernández, Romero & Manzo cols.; Nío River, S 26° 26' 28" W 64° 59' 20", 940 m, 7/VII/1999, Manzo coll. El Siambón, A° s/n, S 26° 44' 21" W 65°26' 51", 04/VIII/2004, Manzo coll.

Catamarca Province: Huacra River (under the bridge) S 28° 00' 27" W 66° 33' 35", 9/II/2000, Manzo coll. A° El Arbolito S 28° 37" 13" W 66° 02' 05", 1040 m, 20/XII/2000, Fernández, Romero & Manzo cols.; Balcozna, arroyo s/n, S 27° 53' 26" W 65° 43' 48", 1200 m, 11/XI/1999, Molineri & Manzo cols.

Córdoba Province: Buena Esperanza River, 13 Km. de Alta Gracia, 1/V/2000, Nieto coll. Ruta Nacional 36, entre Villa Belgrano y Alta Gracia (entrada Estancia La Praviana), arroyo s/n , S 31° 45' 89" W 64° 28' 52", 6/X/1999, Manzo coll.

Acknowledgements

We want to thank Dr M. Archangelsky and Dr W. Shepard for useful comments on this paper, Arturo Roig Alsina (MACN, Buenos Aires, Argentina) for the loan of comparative material used in this work, and the "Agencia Nacional de Promoción Científica y Tecnológica" (Ref.: BID 2007 PICT 1418) for financial support. The second author is a researcher for the Consejo Nacional de Investigación Científica y Tecnológica (CONICET) of Argentina.

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