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A new species of *Desmopachria* BABINGTON from Venezuela (Coleoptera: Dytiscidae: Hydroporinae: Hyphydrini)

G.T. GUSTAFSON & K.B. MILLER

Abstract

A new species of *Desmopachria* (Coleoptera: Dytiscidae), *Desmopachria rex* sp.n. is described from Trujillo State, Venezuela. This newest addition to the genus is one of the largest known *Desmopachria*. Both the female and male genitalia are illustrated. *Desmopachria rex* cannot currently be placed in any of the species groups *sensu* MILLER (2001), but its relation to other species of *Desmopachria* are briefly discussed.

Key words: Coleoptera, Dytiscidae, Hydroporinae, Hyphydrini, *Desmopachria*, taxonomy, new species, Venezuela.

Introduction

The genus *Desmopachria* BABINGTON, 1841 contains relatively small, round, and convex diving beetles. Species can be found in a variety of lentic habitats such as ponds, forest pools, inside bromeliads, or tree hole pools, as well as in few lotic situations such as streams (MILLER 2005). The genus is one of the largest New World genera currently containing 100 species (BRAGA & FERREIRA-Jr. 2010). Although GUIGNOT (1949, 1950) and YOUNG (1980) divided this large genus into seven subgenera, this classification resulted in a probably paraphyletic *Desmopachria* s.str. which lacks distinctive synapomorphies, as well as the uncertain generic assignments of large numbers of species (MILLER 2001, 2005). MILLER (2001) revised the classification by synonymizing the subgenera and instead provided informal species groups to organize members of the genus. The identification of species groups is possible using a number of external characters in conjunction with characters of the male genitalia (MILLER 2005). Dissection of the male genitalia is necessary for reliable identification of most species, and females of many species are difficult to indentify except when collected in association with males (YOUNG 1980). Beginning with MILLER (2001) the female genitalia of several species have been illustrated to assist in identification of females, and we will continue the trend in this paper by providing illustrations of the genitalia of both males and females of the new species described here. The addition of this new species brings the total number of species within this genus to 101.

Materials and Methods

A total of 93 specimens of this new species were examined for this study. All were collected from the same locality in Venezuela, but some were collected on different dates.

Measurements were taken using a Cen-Tech 4 inch Digital Caliper (ITEM 47256). Only intact specimens were measured. Ten specimens were selected at random for measurements. Two measurements were made following MILLER (2005): total length (TL) and greatest width (GW), including range and mean. The ratio TL/GW is given as an indication of shape.

Dissections follow methods used by MILLER (2001).

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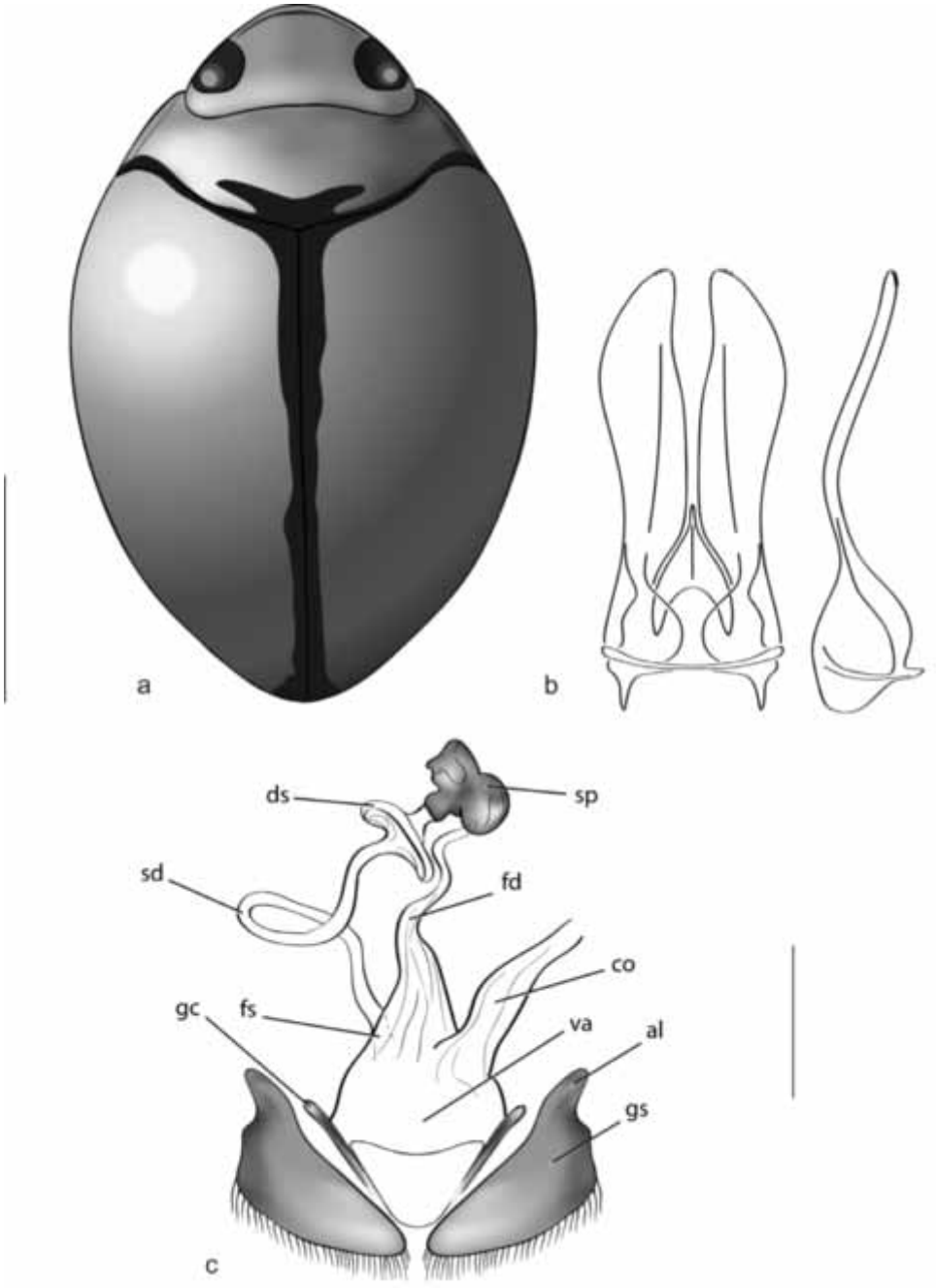

Fig. 1: a) Dorsal habitus of *Desmopachria rex* showing overall shape and color patterning. Scale bar ≈ 1 mm; b) male genitalia of *D. rex* in ventral and lateral aspects; c) female genitalia in ventral aspect. sp = spermatheca, ds = spermathecal disc, sd = spermathecal duct, fd = fertilization duct, fs = fertilization sac, co = common oviduct, va = vagina, gc = gonocoxa, al = anterior lobe of gonocoxosternite, gs = gonocoxosternite. Scale bar ≈ 0.25 mm.

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The holotype is deposited in MIZA (Museo del Instituto de Zoologia Agrícola, Maracay, Venezuela, L. Joly). Paratypes are deposited in MIZA, MSBA (Museum of Southwestern Biology Division of Arthropods, University of New Mexico, Albuquerque, NM, USA, K.B. Miller), KSEM (Division of Entomology, University of Kansas Natural History Museum, Lawrence, KS, USA, A.E.Z. Short), and MALUZ (Museo de Arthrópodos, Universidad del Zulia, Maracaibo, Venezuela, J. Camacho).

Desmopachria rex sp.n.

TYPE LOCALITY: Laguna Agua Negra, Trujillo State, Venezuela.

TYPE MATERIAL: **Holotype** (♂): "VENEZUELA: Trujillo State / 9°18.373N, 70°10.516'W, 1840 m / Laguna Agua Negro- margin of / lagoon w / vegetation; 13.vii.2009 / leg. Short et al; VZ09-0713-03A" (MIZA). **Paratypes** (85) same data as holotypes (MSB, KSEM, MIZA, MALUZ). (7) same locality but "21.i.2009; Laguna Agua Negro/ leg. Short, Garcia, & Camacho/ VZ09-0121-04X: lagoon margin.".

Diagnosis. Distinguishable from all other members of *Desmopachria* by its large size (TL = 3.05–3.24 mm, average = 3.16 mm, it appears to be one of the largest known *Desmopachria*), distinct aedeagus, and the shape of the spermatheca.

Description. *Measurements.* TL = 3.05–3.24 mm, average = 3.16 mm; GW = 1.94–2.10 mm, average = 2.04 mm; average TL/GW = 1.55.

Habitus (Fig. 1a). Size relatively large for the genus; body robust, broadly rounded laterally, attenuated posteriorly; greatest width medially; in lateral view dorsally and ventrally convex, nearly evenly tapered anteriorly and posteriorly.

Coloration. Head and pronotum orange, lighter than elytra, head of some specimens with darker coloration around and between eyes, pronotum of some specimens with darker coloration along posterior margin of pronotum forming top of darker-colored Y-shape; elytra dark brown, elytral disk mottled brown, without pattern, sutural area darker forming the stem of Y-shape. Antennae, palpi, pro- mesolegs and prosternum lighter orange to yellow ventrally; meso-, metaventrite, metalegs and abdomen dark orange to brown.

Sculpture and structure. Head with fine, well-impressed punctures, beginning at posterior margin of eyes and continuing anteriad to apical margin of clypeus, punctation density highest posteriorly along eye margins becoming more dispersed medially and anteromedially; anterior clypeal margin dorsoventrally compressed, somewhat elongate anteromedially, and distinctly beaded across entire margin between eyes, ending just anterior to eyes; antennae with pedicel round and expanded medially; antennomeres VI–XI subserrate with an anteroapical expansion, antennomere V, VII, and IX with an anteroapical stout seta; ultimate antennomere elongate ≈ 2× length of penultimate and with greatest anteroapical expansion, bearing 2 short, stout subapicolateral setae and 3 short stout setae apically. Pronotum with fine, well-impressed punctation, puncture density highest along anterior and posterior pronotal margins, pronotal disk with narrow region of low punctation density medially; pronotal shape as in Fig. 1a; anterior margin of pronotum with fringe of long fine setae. Elytra with regular covering of fine well impressed punctation; apical half of elytra with dense covering of short fine setae, setae appear to be long but regularly broken off, absent from humeral angles. Prosternum large, anterior margin broad and nearly straight, lateral margins rounded, anteriorly fringed with setae; posterior extension of prosternum long, parallel sided, with posteromedial carina; carina in lateral view anteriorly acute and raised posteriorly above the anterior portion of prosternum leading to prosternal process; carina with posteromedial patch of long fine setae. Prosternal process atennuated apically, slightly divergent approaching posteromedial pronotal carina; broadest anterolaterally, rounded laterally and slightly narrowed posteriorly. Metaventrite impunctate.

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Metacoxae strongly and regularly punctate, punctures well impressed. Abdominal sterna laterally punctate, punctures very fine and weakly impressed; punctures setose, with very fine setae; sterna IV–VI posteriorly margined with fine setae, sternum IV with posteromedial patch of very long fine yellow setae, extending to apical margin of sternum VI, sternum V also with medial patch of shorter, fine seta, sternum six with a large patch of setae medially, posteriorly fringed with short thick setae.

Male genitalia (Fig. 1b). Median lobe short, triangular, apically attenuated with apex highly acute, medially a with ridge running most its length. Parameres laterally and medially sinuate in dorsal respect, apically bearing several short setae, in lateral respect sinuate with a dorsal upturn apically, abruptly broadened basally.

Female genitalia (Fig. 1c). Spermatheca globular with a large, rounded spermathecal cap, with a distinct finger-like invagination; spermathecal duct and fertilization duct loose, not tightly wound, fertilization duct short and broadly attenuated into fertilization sac; Gonocoxae reduced; apex of vagina without rami; Gonocoxosterna large, lightly attenuated posteroapically with posterior margin fringed with numerous long fine setae, anterior lobe short and attenuate with shallow lateral curve.

Variation: Variation mainly occurs in the depth of coloration in the elytra, as well as the degree of development of the Y-shaped dorsal patterning.

Taxonomy. This species currently cannot be placed in a species group, see discussion for further details.

Habitat. (Figs. 2–3). This species is only known from the type locality, Laguna de Agua Negra, in Trujillo State, Venezuela. Specimens were collected from the vegetated margins of a large pond using an aquatic insect net. The single collecting event yielded 86 specimens, an earlier collecting event at the same locality (August instead of July) yielded only 7. Therefore, it appears that the time of the year when collecting may be important for obtaining this species.

Etymology. The specific epithet rex means king and is treated as a noun in apposition. We felt that since this new species appears to be the largest *Desmopachria* currently known, it deserved to be dubbed the king of *Desmopachria*. Furthermore, we enjoy the similarity of the sound of *D. rex* to *T. rex* (*Tyrannosaurus rex*).

Discussion

Desmopachria rex currently cannot be placed within a species group. The male genitalia appear to be most similar to that of *D. chei* MILLER as depicted by MILLER (1999, 2001). Both species appear to have aedeagi with short triangular median lobes, parameres apically with short setae and abruptly expanded basally in lateral aspect. Externally they are also similar in size and relatively large members of the genus. However, *D. rex* lacks a sutural stria and, therefore, does not belong within the *D. striola* group *sensu* MILLER (2001). The female genitalia show similarities to species in the *D. convexa* group *sensu* MILLER (2001). *Desmopachria rex* has female genitalia similar to the two species *D. challeti* MILLER and *D. convexa* AUBÉ. Like these species *D. rex* has a spermathecal cap with a distinctly invaginated lobe and reduced gonocoxae. In his discussion, MILLER (2001) indicates that these two characters might be good synapomorphies for some of the species, and, as such, *D. rex* may be related to these species. However, female genitalia have not been thoroughly surveyed across the genus making definitive statements difficult. Clearly this large genus is in need of comprehensive revision with a close examination of female genitalia to potentially provide more morphological characters for phylogenetic analysis.

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Figs. 2–3: Habitats of *Desmopachria rex*; 2) type locality, Laguna Agua Negra, Venezuela; 3) vegetative margins of Laguna Agua Negra.

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