

**A new species of *Hydrobiomorpha*  
from iSimangaliso Wetland Park, South Africa  
(Coleoptera: Hydrophilidae)**

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**Abstract.** *Hydrobiomorpha perissinottoi* sp. nov. is described from iSimangaliso Wetland Park, in the Maputaland region of KwaZulu-Natal, Republic of South Africa. The new species was found in a range of small wetlands around Lake St. Lucia, where it appears to be relatively abundant. Diagnostic notes are provided to allow *H. perissinottoi* sp. nov. to be distinguished from other Afrotropical species of the genus, together with information on its ecology. The new species was part of a diverse water beetle fauna and co-occurred with the superficially similar *Hydrochara fulvofemorata* (Fairmaire, 1869), which is reported from the Republic of South Africa for the first time.

**Key words.** Coleoptera, Hydrophilidae, *Hydrobiomorpha*, new species, South Africa, Afrotropical Region

### Introduction

*Hydrobiomorpha* Blackburn, 1888 is a genus of large water scavenger beetles (SHORT 2010), whose 55 extant species have a largely tropical distribution, being known from the Neotropical, southern Nearctic, Afrotropical, Oriental and Australasian Regions (MOUCHAMPS 1959, WATTS 1990, HANSEN 1999, SHORT 2004, HEBAUER 2006), with fossil species from the Eocene of Europe (e.g. FIKÁČEK & SCHMIED 2013). The Afrotropical fauna currently includes 12 species (HEBAUER 2006), three of which (*H. celata* Mouchamps, 1959, *H. cultrifera* (Régimbart, 1903) and *H. wencki* (Paulino d'Olivera, 1880)) have been reported from southern Africa (HANSEN 1999, STALS 2007); the last two being listed for Republic of South Africa by HEBAUER (2006), without locality data. Lake St. Lucia on the north-east coast of South Africa is a prominent coastal lagoon system, situated within the iSimangaliso Wetland Park, a UNESCO World Heritage Site and Ramsar Wetland with high biodiversity. iSimangaliso and the coastal plains of KwaZulu-Natal are part of Maputaland, a centre of endemism and

transition zone between the tropical lowlands to the north and temperate regions to the south and west. Ocean currents flowing south from Mozambique mean that the region's biota is dominated by tropical species despite its rather high southern latitude (VAN WYK & SMITH 2001). Some specimens of *Hydrobiomorpha* were found in a number of small wetlands around Lake St. Lucia in January and February 2015. These represent a new species, which is described below, together with comparative and ecological notes.

### Materials and methods

Specimens were studied using Leica MZ8 and M205C stereomicroscopes, with a Fluopac FP1 fluorescent illuminator. Habitus photographs were taken with a Canon EOS 600D camera fitted with a Sigma 50mm f/2.8 EX DG macro lens and illuminated with two of the above lights. Images of morphological features and male genitalia were taken with the same camera fitted to a Leica Z6 Apo microscope, fitted with a 2× objective lens. Genitalia were mounted on glass slides in Kisser's glycerol gelatine (see RIEDEL 2005). All image stacks were produced by hand, and combined using Zerene Stacker software ([www.zerene.com](http://www.zerene.com)).

Material examined is deposited in the following institutions and collections:

- AMGS Albany Museum, Grahamstown, Eastern Cape Province, South Africa;  
 BMNH Natural History Museum (Formerly British Museum, Natural History), London, UK;  
 CDTB David T. Bilton Collection, Plymouth, UK;  
 IRSNB Institut royal des Sciences naturelles de Belgique, Brussels, Belgium;  
 NMW Naturhistorisches Museum Wien, Vienna, Austria;  
 SAMC Iziko South African Museum, Cape Town, South Africa;  
 SANC South African National Collection of Insects, Pretoria, South Africa;  
 TMSA Ditsong Museum, Pretoria, South Africa.

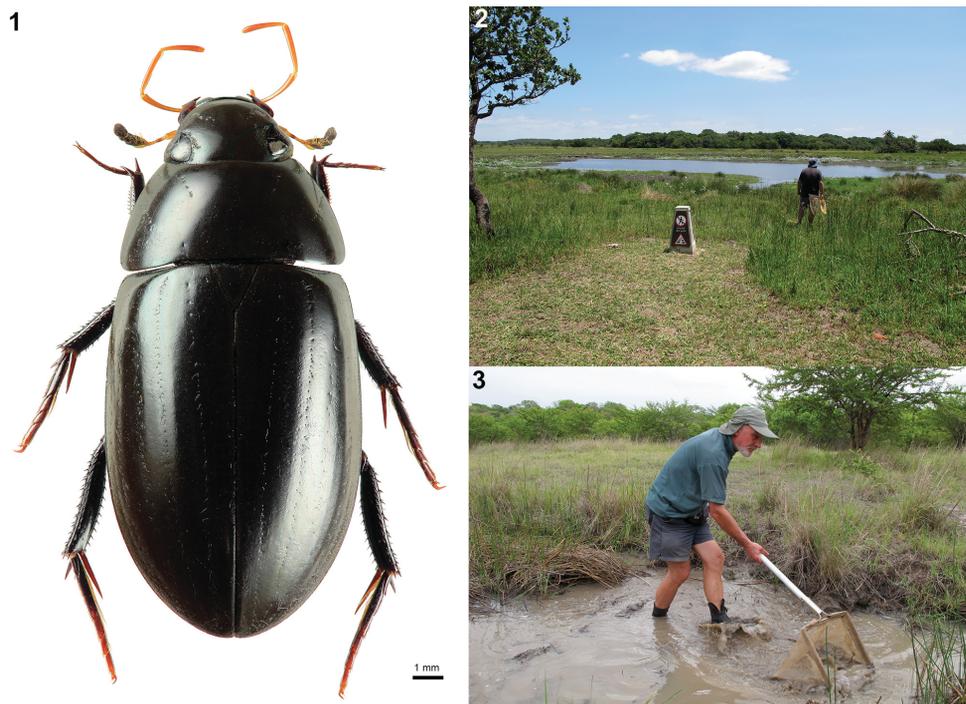
### Taxonomy

#### *Hydrobiomorpha perissinottoi* sp. nov.

(Figs 1–6, 9, 12)

**Type material.** HOLOTYPE: ♂, SOUTH AFRICA: KwaZULU-NATAL: “6/ii/2015 South Africa KZN / St Lucia iSimangaliso Wetland / Park Eastern Shores 6- 28° 18' / 59.84”S 32° 26' 10.83”E D T Bilton” (genitalia extracted and mounted on same card) and red holotype label (TMSA). PARATYPES (7 spec.): SOUTH AFRICA: KwaZULU-NATAL: 1 ♂, 2 ♀♀ same data as holotype. 1 ♂, “4/ii/2015 South Africa KZN / St Lucia iSimangaliso Wetland / Park Western Shores 1- 28° 14' / 14.94”S 32° 24' 32.06”E D T Bilton”. 1 ♀, “South Africa KZN / St Lucia iSimangaliso Wetland / Park False Bay 5- 28° 0' / 51.70”S 32° 21' 56.36”E D T Bilton”. 1 ♂, 1 ♀ “4/ii/2015 South Africa KZN/ St Lucia iSimangaliso Wetland / Park Western Shores 5- 28° 17' / 44.79”S 32° 22' 58.83”E D T Bilton”. All with red paratype labels (AMGS, CDTB, NMW, SAMC, SANC).

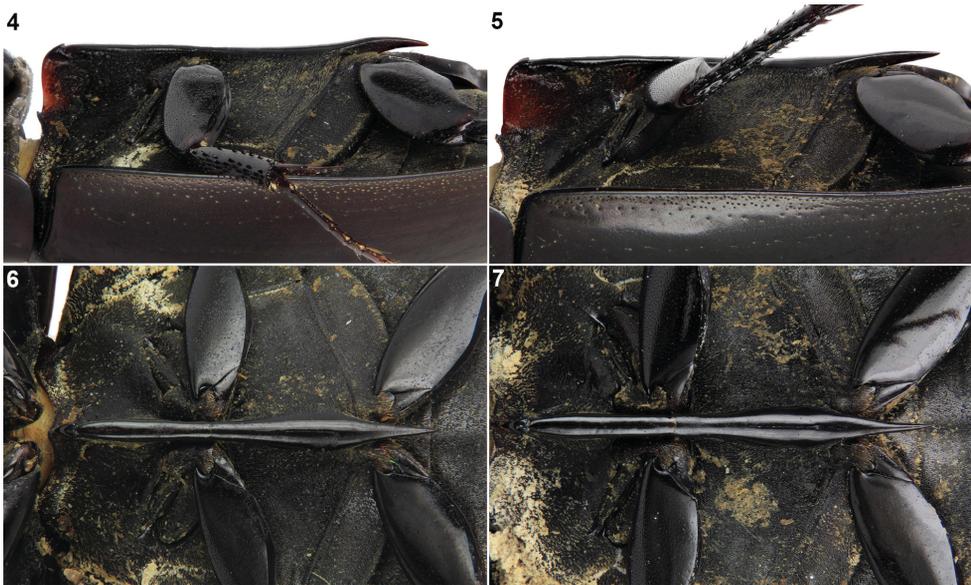
**Description.** *Size.* Body length 17.6–19.5 mm; elytral length 11.5–13.6 mm; elytral width 8.2–9.3 mm. *Colour.* Dorsum (Fig. 1) dark brown to black, with aeneous green tones, particularly on basal 0.6 of labrum, on anterior part of clypeus, along frontoclypeal suture, hind margin of pronotum and on scutellum. Mandibles clear reddish-brown. Antennae with scape straw yellow; pedicel yellow basally, reddish infuscation in distal half; intermediate segments and cupule straw yellow; club black, except for long yellow setae. Maxillary palpi straw yellow;



Figs 1–3. 1 – *Hydrobiomorpha perissinottoi* sp. nov., male holotype, dorsal habitus; 2–3 – *Hydrobiomorpha* habitats at iSimangaliso. 2 – Western Shores 1; 3 – False Bay 5.

apical segment infuscated. Labial palpi yellow. Legs dark brown to black; tibial spurs and tarsi paler, especially apically. Venter dark brown to black; prosternal carina paler, reddish brown.

**Head.** Labrum strongly transverse, rounded apicolaterally with broad, shallow apicomedian emargination. Surface shining, no microreticulation, with double ground punctation; medium, shallow, medium punctures and close, shallow, fine punctures approximately 0.2 diameter of medium punctures. Two distinct pits either side of mid-line approximately 0.6 from apex, each bearing a cluster of trichobothria. Row of 5–6 systematic punctures immediately in front of posterior margin, either side of mid-line. Anterior margin of clypeus broadly emarginated, exposing thin membrane. Clypeus and frons shining, without microreticulation. Ground punctures in most areas of four distinct sizes: very sparse, moderate punctures; sparse, moderate punctures, diameter 0.5 previous; moderate, fine punctures, diameter 0.5 previous; close, very fine punctures, diameter 0.3 previous. Systematic punctures strong on clypeus and around inner margins of compound eyes, most with trichobothria. Compound eyes large, occupying approximately 0.4 lateral margin of head.

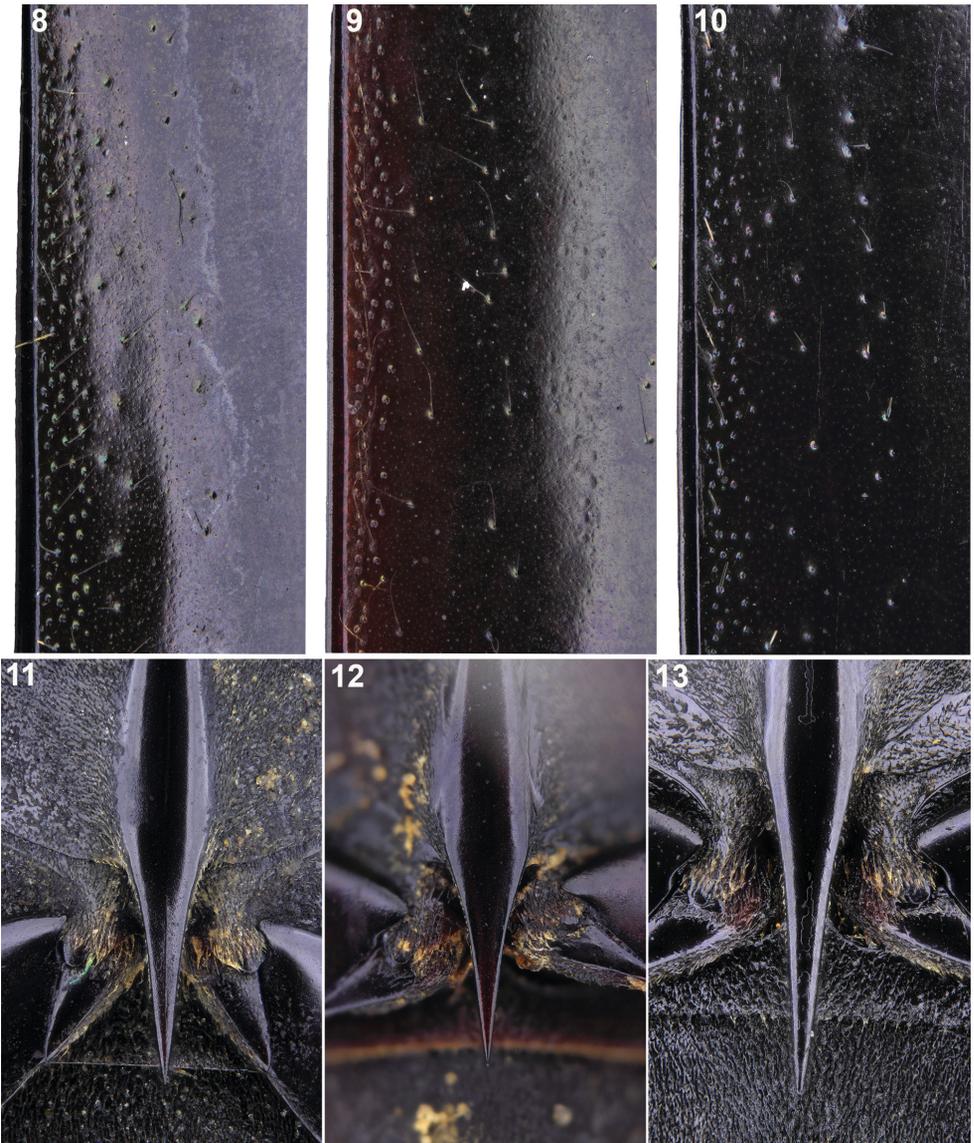


Figs 4–7. Meso and meta-ventrites of *Hydrobiomorpha perissinottoi* sp. nov. 4, 6 – male paratype; 5, 7 – female paratype. 4–5 – ventral; 6–7 – lateral.

**Pronotum** arched, transverse, broadest at hind margin and narrowed to anterior angles. Anterior margin arcuate; posterior margin bisinuate around centre. Lateral margins narrowly beaded, bead ending just inside anterior angles. Anterior angles obtusely rounded; posterior angles broadly rounded. Surface shining, without microreticulation and with ground punctation as on clypeus and frons. Systematic punctures distinct, somewhat smaller than on head.

**Elytra** elongate oval, broadest just behind middle. Subparallel over anterior 0.6 then evenly rounded to apex; weakly emarginated at suture. Anterior and lateral margins beaded, bead broadest at shoulder and over anterior 0.6, then narrowing to apex. Surface shining, with fine, shallow isodiametric microreticulation and moderate, fine to very fine ground punctures; punctures varying in size, punctation not clearly double. Very shallow, irregular circular depressions also evident on disc. Irregular field of rather dense, moderate punctures interior to lateral bead (Fig. 8), from shoulder to apex; each puncture with short, peg-like seta in anterior 0.5, seta not usually emerging from puncture. Systematic punctures in five rows, outer row mixed in with lateral puncture field. First row of systematic punctures slightly impressed. Systematic punctures also present along elytral margin in posterior 0.3.

**Venter.** Mentum shining, with moderate, coarse punctures and longitudinal wrinkles, directed anterolaterally, in lateral 0.3. Submentum shining, with sparse, moderate punctures and very close, very fine punctures, diameter approximately 0.2 previous. Submentum and anterior portion of gula excavated, forming an elongate bowl. Gula shining, wrinkled, with hydrofuge pubescence. Genae shining, wrinkled and glabrous either side of gula; pubescent



Figs 8–13. *Hydrobiomorpha* elytral margins and metaventral spines. 8–10 – elytral margins; 11–13 – metaventral spines. 8, 11 – *Hydrobiomorpha perissinottoi* sp. nov.; 9, 12 – *H. occidentalis* Balfour-Browne, 1939; 10, 13 – *H. celata celata* Mouchamps, 1959.



Figs 14–16. Aedeagi. 14 – *Hydrobiomorpha perissinottoi* sp. nov.; 15 – *H. celata celata* Mouchamps, 1959; 16 – *H. occidentalis* Balfour-Browne, 1939.

laterally. Prosternum shining, with hydrofuge pubescence, punctate, punctures bearing long, yellow erect setae. Prosternal carina glabrous, projecting slightly anteriorly. Prosternal process acuminate, directed posteroventrally, ending halfway along procoxae. Mesoventrite and metaventrite (Figs 4, 6) covered with hydrofuge pubescence, except on keels. Mesoventral keel with small anterior notch; continuous posteriorly with keel of metaventrite. Metaventral keel (Figs 4, 6, 11) produced into horizontal spine posteriorly, slightly arched ventrally just in front of spine, spine slightly dorsally directed, with distinct central keel (Fig. 11). Apex of spine just surpassing posterior margin of abdominal ventrite 1. Abdominal ventrites 1–4 entirely covered in hydrofuge pubescence; abdominal ventrite 5 with median, longitudinal glabrous patch occupying posterior 0.6 of segment.

**Aedeagus.** Elongate, with rounded basal piece (Fig. 14). Parameres elongate, narrow, sinuous to apex, with single, laterally-directed spine. Median lobe with ventral ornamentation consisting of apical hood and thin, hooked process, followed by low, narrow raised strip running for much of length. Aedeagal membranes well developed dorsolaterally, expanding to partially envelop the distal 0.5 of median lobe. *Female.* As male, except for somewhat flatter metaventral keel, and slightly longer metaventral spine, which lacks the central keel (Figs 5, 7). **Variation.** Paratypes vary somewhat in body size and in the development of the shallow circular depressions on the elytral disc, but are otherwise almost identical.

**Differential diagnosis.** The new species would key to *H. celata celata* Mouchamps, 1959 and *H. occidentalis* Balfour-Browne, 1939 in MOUCHAMPS (1959) and HEBAUER (2006), on the basis of the metaventral spine, which extends beyond the posterior margin of abdominal ventrite 1, but does not reach the posterior margin of ventrite 2, the irregular puncture field along the lateral elytral margins (Figs 8–10) and the presence of a large glabrous patch on abdominal ventrite 5. I have examined the holotype, 12 paratypes (IRSNB) and 7 additional specimens (BMNH) of *H. celata celata*, a taxon described from the Democratic Republic of the Congo and reported from Ethiopia, Burundi, Gabon, Malawi, Mozambique, Rwanda, Zambia, Sudan and Uganda (Hebauer 2006). In addition to the nominotypical form, *H. celata namibiensis* Hebauer, 2006 was described on the basis of females from Kavango and the Caprivi Strip in northeastern Namibia. It differs from *H. celata celata* in the shape of the metaventral spine, and the single row of punctures along the elytral margin. This is also clearly not *H. perissinottoi* sp. nov., although its status as a subspecies of *H. celata* may change once males become available. I have also examined the holotype, paratype and one additional specimen of *H. occidentalis* (BMNH), a species described from Nigeria and later reported from Egypt, Sudan and Tanzania. The additional specimen in the BMNH is a male labelled “Sobat River / Egypt / Zaphiro / 1905-252”, a locality in what is now South Sudan. It is not part of the type series and has been labelled as *H. wencki* by d’Orchymont, but more latterly (1958) identified as *H. occidentalis* by J. Balfour-Browne, a determination with which I concur. On external and aedeagal morphology, the new species is closest to *H. occidentalis*, although its larger size and darker colouration mean it superficially resembles *H. celata celata*. At 17.6–19.5 mm, *H. perissinottoi* sp. nov. is somewhat intermediate in size between the two species (*H. celata celata* 18–23 mm, *H. occidentalis* 15–16 mm), but most closely resembles *H. celata celata*. BALFOUR-BROWNE (1939) mentions a female specimen from Nigeria 20 mm long, which he considers likely to be *H. occidentalis*, but excludes from the type series. I have been unable to find this specimen in the BMNH, which may belong to another species. The metaventral spine of the new species most closely resembles that of *H. occidentalis* in relative length, that of *H. celata celata* being longer (see Figs 11–13). Both *H. occidentalis* and *H. perissinottoi* sp. nov. also have keels on the metaventral spines in males – a secondary sexual character lacking in *H. celata*, and one which has not been previously reported in the genus. As well as being smaller than the new species, *H. occidentalis* has a more strongly evident greenish sheen, which is present over the entire dorsum with some metallic reflections, a narrower marginal elytral puncture field (Fig. 9) and much closer larger punctures on the pronotum and elytra. *H. celata celata* is superficially more similar to the new species in colouration and size, but has a much longer metaventral spine (Fig. 13). The aedeagi of the three species

(Figs 14–16) also differ significantly, that of *H. perissinottoi* sp. nov. being most similar to *H. occidentalis*, sharing the same general design. The two species differ in the angling of the parameres in ventral view, the more dorsally directed median lobe of *H. perissinottoi* sp. nov. in lateral view and the shape of the median lobe in ventral view (distinctly expanded before the apex in *H. occidentalis*; almost straight in *H. perissinottoi* sp. nov.), as well as its ventral ornamentation, best seen in lateral and dorsolateral views – note in particular the ventral raised strip, which is relatively high in *H. occidentalis*, and much lower and less evident in *H. perissinottoi* sp. nov. (Figs 14, 16).

**Etymology.** Named for Professor Renzo Perissinotto, coleopterist and aquatic biologist, whose work has significantly improved understanding of the biodiversity, ecology and conservation of the Lake St. Lucia system, and who kindly organised the 2015 sampling trip on which this species was detected. The specific epithet is a noun in the genitive case.

**Distribution and ecology.** Known to date only from small wetlands around Lake St. Lucia (e.g. Figs 2–3), where it appears to be widespread, at least locally. Here it was part of a diverse water beetle assemblage (see PERISSINOTTO et al. 2016), including *Hydrochara fulvofemorata* (Fairmaire, 1869), itself not previously reported from South Africa (SMETANA 1980, STALS 2007). Many more specimens of *Hydrobiomorpha*/*Hydrochara* were seen in the field than were collected, and the new species is likely to be common in this region. Found in both basin and depression wetlands (sensu OLLIS et al. 2013).

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### References

- BALFOUR-BROWNE J. 1939: Contribution to the study of Palpicornia II. *Entomologist's Monthly Magazine* **75**: 1–8.
- FIKÁČEK M. & SCHMIED H. 2013: Insect fauna of the Late Miocene locality of Öhningen (Germany) less diverse than reported: an example of the hydrophilid beetles (Coleoptera). *Journal of Paleontology* **87**: 427–443.
- HANSEN M. 1999: *Hydrophiloidea (s.str.) (Coleoptera)*. *World Catalogue of Insects*. Vol. 2. Stenstrup, Denmark, 416 pp.
- HEBAUER F. 2006: Aktualisierte Bestimmungstabelle für die afrikanischen Arten der Gattung *Hydrobiomorpha* Blackburn, 1888 (Coleoptera: Hydrophilidae). *Acta Coleopterologica* **22(2)**: 31–37.
- MOUCHAMPS R. 1959: Remarques concernant les genres *Hydrobiomorpha* Blackburn et *Neohydrophilus* Orchymont (Coleoptères Hydrophilides). *Bulletin et Annales de la Société royale d'Entomologie de Belgique* **95**: 295–335.
- OLLIS D., SNADDON C., JOB N. & MBONA N. 2013: *Classification System for Wetlands and other Aquatic Ecosystems in South Africa. User Manual: Inland Systems*. SANBI Biodiversity Series 22. South African National Biodiversity Institute, Pretoria, 110 pp.
- PERISSINOTTO R., BIRD M., BILTON D.T. 2016: Predaceous water beetles of the Lake St. Lucia system, South Africa: biodiversity, community ecology and conservation implications (Coleoptera, Hydradeptera). *ZooKeys* **595**: 85–135.

- RIEDEL A. 2005: Digital imaging of beetles (Coleoptera), and other three-dimensional insects. Pp. 222–250. In: HÄUSER C., STEINER A., HOLSTEIN J. & SCOBLE M.J. (eds.): *Digital Imaging of Biological Type Specimens. A Manual of Best Practice*. Results from a study of the European Network for Biodiversity Information, Stuttgart, 309 pp.
- SHORT A. E. Z. 2004: Review of the Central American species of *Hydrobiomorpha* Blackburn (Coleoptera: Hydrophilidae). *Koleopterologische Rundschau* **74**: 363–366.
- SHORT A. E. Z. 2010: Phylogeny, evolution and classification of the giant water scavenger beetles (Coleoptera: Hydrophilidae: Hydrophilini: Hydrophilina). *Systematics and Biodiversity* **8**: 17–37.
- SMETANA A. 1980: Revision of the genus *Hydrochara* Berth. (Coleoptera: Hydrophilidae). *Memoires of the Entomological Society of Canada* **111**: 1–100.
- STALS R. 2007: Checklist of the known Southern African taxa of aquatic Coleoptera. Pp 205–229. In: STALS R. & DE MOOR I. J. (eds.): *Guides to the Freshwater Invertebrates of Southern Africa, Volume 10: Coleoptera*. Water Research Commission, Pretoria, 263 pp.
- VAN WYK A.E. & SMITH G. F. 2001: *Regions of Floristic Endemism in Southern Africa: a Review with Emphasis on Succulents*. Umdaus Press, Hatfield, 199 pp.
- WATTS C. H. S. 1990: Revision of Australian *Hydrobiomorpha* Blackburn (Coleoptera: Hydrophilidae). *Records of the South Australian Museum* **24**: 35–42.

