

***Hydroporus toubkal* sp. nov. from the High Atlas, Morocco,  
a new member of the *H. longulus* group  
(Coleoptera: Dytiscidae: Hydroporinae)**

Hans FERY<sup>1)</sup> & Jiří HÁJEK<sup>2)</sup>

<sup>1)</sup>Räuschstraße 73, D-13509 Berlin, Germany; e-mail: hanfry@aol.com

<sup>2)</sup>Department of Entomology, National Museum, Kunratice 1, CZ-148 00 Praha 4, Czech Republic;  
e-mail: jiri\_hajek@nm.cz

**Abstract.** *Hydroporus toubkal* sp. nov. of the *H. longulus* species group is described from the High Atlas, Morocco. The new species is similar to *H. longulus* Mulsant & Rey, 1861, *H. nevadensis* Sharp, 1882 and *H. jacobsoni* Zaitzev, 1927. From these three species, *H. toubkal* sp. nov. can be distinguished with certainty only by the shape of the median lobe of aedeagus. The habitus and the male and female genitalia of the new species are illustrated. Figures of the aedeagi of *H. jacobsoni*, *H. longulus* and *H. nevadensis* are provided for comparison.

**Key words.** Coleoptera, Dytiscidae, *Hydroporus*, *longulus* group, new species, Morocco, Palearctic Region

## Introduction

The *Hydroporus longulus* group is a morphologically (see e.g. FERY & ERMAN 2009) and molecularly (e.g. HERNANDO et al. 2012) well defined group, formerly classified in the subgenus *Sternoporus* Falkenström, 1930 (for the history of classification see FERY 2009) within the Holarctic genus *Hydroporus* Clairville, 1806. The group comprises 28 species so far, distributed in the western Palearctic from Morocco to Iran (FERY 2009, HÁJEK & FIKÁČEK 2010). Members of the group are characterised by (1) body more or less subparallel in outline; (2) body surface microreticulated; (3) pronotum with broad lateral beading; (4) epipleuron visible up to humeral angle in lateral view; (5) metacoxal lines diverging anteriorly; (6) metacoxal processes with sinuate posterior margin; (7) median lobe asymmetric in ventral and often also in frontal view (cf. FERY 2009: Fig. 1d). In addition, most species of the group have special habitat preferences: they can often be found in springs or muddy and vegetated areas near flowing water bodies, sometimes in hygropetric habitats, and often at

high altitudes (cf. FERY 2009). These habitat requirements, together with presumably limited swimming and flying capabilities (e.g. KEHL & DETTNER 2007), may be the reason that some species have a rather limited distribution and tend to split into diverse polytypic forms (e.g. HÁJEK & FIKÁČEK 2010).

The presence of a species of the *H. longulus* group in Morocco was previously known – GUIGNOT (1959) mentioned *Hydroporus longulus* Mulsant & Rey, 1861 from the High Atlas. This species is known to occur in large parts of western Central Europe eastward to Germany and Austria (FERY 1999). We had no possibility to study the specimens cited by Guignot, however, a series of recently collected specimens in our hands revealed that another undescribed species occurs in the High Atlas, which is similar to *H. longulus* but differs predominantly in the male genitalia. Its description is the aim of the present paper.

### Material and methods

The material studied was examined with an Olympus SZX12 and an Olympus SZX16 stereoscopic microscope. The male genitalia were studied in wet condition. The terminology to denote the orientation of the genitalia follows MILLER & NILSSON (2003).

Exact label data are cited for the type material. Separate label lines are indicated by slash (/). Authors' remarks and addenda are given in square brackets.

The following abbreviations are used in the description: TL – total length, length from front of head to apex of elytra; TL-h – total length minus head length, length of body from anterior margin of pronotum to apex of elytra; TW – maximum width of body measured at right angles to TL.

The specimens included in this study are deposited in the following institutional collections:

|      |   |
|------|---|
| CHF  | Hans Fery collection, Berlin, Germany, property of NHMW;  |
| KOFM | Kamil Orszulik collection, Frýdek-Místek, Czech Republic; |
| NMPC | Národní muzeum, Prague, Czech Republic;                   |
| NHMW | Naturhistorisches Museum Wien, Vienna, Austria.           |

### Taxonomy

#### *Hydroporus toubkal* sp. nov.

(Figs 1–4, 8–9)

? *Hydroporus longulus* Mulsant & Rey, 1861: KOCHER (1958): 18 (misidentification); GUIGNOT (1959): 395 (misidentification).

**Type locality.** Morocco, High Atlas, [Jebel] Toubkal Mt., near Refuge du Toubkal “Les Moufflons”, ca. 3100 m; coordinates ca. 31.067N, 7.936W.

**Type material.** HOLOTYPE: ♂: ‘MOROCCO / Toubkal 2600-3400m / 5.5.2008 / Igt.Orszulik [printed]’, ‘HOLOTYPE / HYDROPORUS / toubkal sp. nov. / H. Fery & J. Hájek des. 2013 [red label, printed]’ (NMPC). PARATYPES: 2 ♂♂, 4 ♀♀, same label data as the holotype (CHF, KOFM, NMPC).

**Additional material examined.** 1 ♀, Morocco, Haute Atlas, 4 km NE Oukaïmeden, ca. 31.23N 7.81W, ca. 2100 m, brook, 9.viii.1985, H. Fery leg.; so far the specimen has been determined as “*H. longulus*?”; the locality is situated ca. 15 km NNE of the locus typicus of the new species and ca. 50 km SSE Marrakesh. As single females cannot be determined with certainty, we refrain from including it in the type series.

**Description of the holotype. *Habitus.*** In dorsal view elongate oval; body outline with slight but perceptible discontinuity between pronotum and elytra; maximum width near body mid-length. Almost entire dorsal and ventral surface shiny (Fig. 1).

***Colouration.*** Body black, posterior part of head, anterior margin of pronotum, pronotal lateral beading and sides of elytra indistinctly dark brownish translucent. Genae and gula black. Legs and head appendages testaceous, antennomeres V–XI apically somewhat darker.

***Sculpture and structure.*** Head rather broad, interocular distance equalling about half of pronotal width at posterior angles. Clypeus with two interocular grooves. Head with microreticulation composed of shallowly impressed polygonal meshes; meshes somewhat smaller near anterior margin of head. Punctuation consisting of moderately coarse punctures, irregularly distributed, distance between punctures about 2–4 times that of their diameter; punctures near anterior margin and on vertex smaller, near anterior margin and in grooves denser; next to inner side of eyes with distinct setiferous puncture line. Antennomere IV shorter than antennomeres III and V; III slightly longer than V; antennomeres VI–X slightly longer than V, more than 1.5 times as long as wide, slightly flattened, in cross section more or less elliptical.

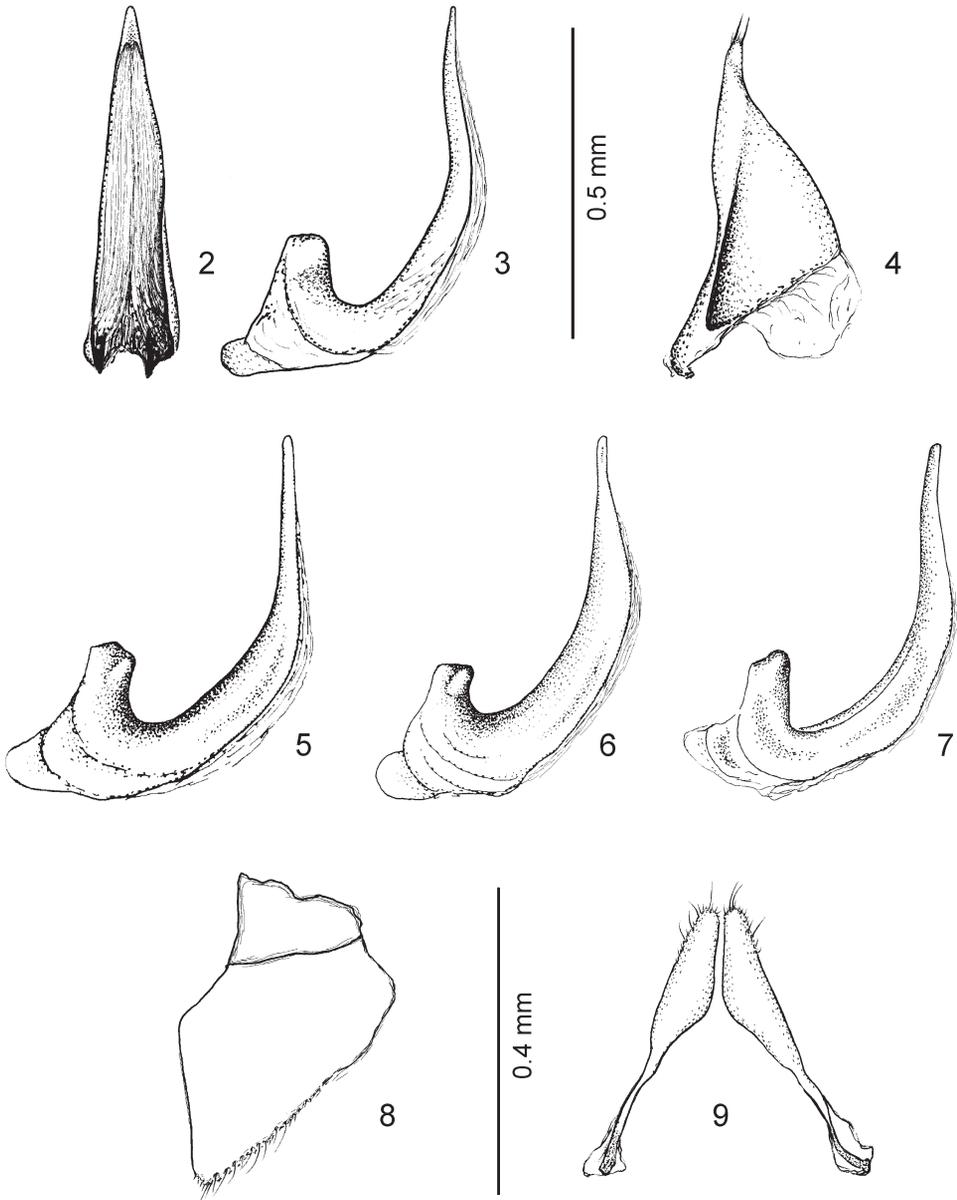
Pronotum with maximum width between posterior angles; sides in anterior half weakly curved, in posterior half almost straight and parallel. Lateral beading distinct, somewhat broader in anterior third. Pronotum postero-laterally with elongate depressed area on each side. Microreticulation similar to that of head, but slightly more impressed. Punctuation on disc rather fine and sparse; center of disc with one very coarse longitudinally deformed puncture, punctuation becoming progressively coarser and denser laterally, there coarser than on head; along anterior margin with distinct line of setiferous punctures, line shortly interrupted in middle, beside punctures in line finer and dispersed, more towards sides coarser and denser; puncture line before posterior margin lacking.



Fig. 1. *Hydroporus toubkal* sp. nov., habitus of male holotype.

along anterior margin with distinct line of setiferous punctures, line shortly interrupted in middle, beside punctures in line finer and dispersed, more towards sides coarser and denser; puncture line before posterior margin lacking.

Elytra with microreticulation similar to that of head and pronotum. Punctuation setiferous, size of punctures mostly similar to that on lateral parts of pronotum; punctures on disc more or less uniformly distributed, somewhat smaller behind anterior margin, on sides, apex, and next to suture. Distance between punctures on disc approximately two times their



Figs 2–9. 2–4, 8–9 – *Hydroporus toubkal* sp. nov.: 2 – median lobe of aedeagus in ventral view; 3 – median lobe in lateral view; 4 – left paramere; 8 – gonocoxosternum; 9 – gonocoxae. 5 – *H. longulus* Mulsant & Rey, 1861, median lobe of aedeagus in lateral view (adapted from FERY 1999). 6 – *H. nevadensis* Sharp, 1882, median lobe of aedeagus in lateral view (adapted from FERY 1999). 7 – *H. jacobsoni* Zaitzev, 1927, median lobe of aedeagus in lateral view (adapted from FERY 2009).

diameter. Discal puncture lines not very distinct but perceptible, marked by somewhat denser normal punctures and a few interspersed coarser punctures; sutural puncture line lacking. Margin of elytra slightly ascending towards humeral angle in lateral view. Lateral elytral beading distinct, narrower than pronotal beading. Epipleuron visible to humeral angle in lateral view.

Legs. Protibia rather strongly broadened distally. Pro- and mesotarsomeres I–III slightly dilated and with sucking setae, tarsomeres I with small oval sucker discs in addition to sucking setae. Protarsal claws short, more or less of same length, proximally broadened; posterior (outer) claw strongly curved near base, almost evenly curved over rest of length; anterior (inner) claw more strongly curved near base and almost straight in distal two thirds; mesotarsal claws of same length and evenly curved, longer than protarsal claws.

Venter with most parts weakly microreticulate; gula, prosternal process, medial part of metaventrite and metacoxal processes smooth; genae smooth close to gula, laterally distinctly reticulated. Meshes regularly polygonal on genae, sides of metaventrite, metacoxal plates, epipleura, and last (VI) abdominal ventrite; meshes on abdominal ventrites I–V very elongate, on sides more or less longitudinally oriented, in middle transverse. Head posterior to eyes with distinct crease, near mouthparts with several distinct wrinkles. Gula on sides with a few coarse punctures, genae impunctate. Punctuation on sides of metaventrite, on metacoxal plates, and on sides of abdominal ventrites I–II rather coarse; on epipleura, centre of metaventrite, metacoxal processes, and rest of abdominal ventrites less coarse. More or less all punctures with a seta. Centre of abdominal ventrites III–V with a tuft of long setae.

Prosternal process lanceolate, very elongate; longitudinal carina narrow, more or less tectiform in cross-section, but ridge rounded; sides broadened and margin provided with very coarse punctures and long setae. Process reaching between mesocoxae and onto furrow of anteromedial metaventral process; thus, mesocoxae not contiguous. Base of prosternum strongly impressed; file broad, smooth, transverse ridges very weak; between procoxae with one strong transverse ridge.

Posterior margins of metacoxal processes medially protruded backwards, laterally sinuate; metacoxal lines diverging anteriorly, not reaching posterior margin of metaventrite; intralinear space posteriorly with numerous long golden setae.

**Genitalia.** Median lobe of aedeagus asymmetric; in ventral view only slightly convergent in basal two thirds, more evenly tapering to apex in apical third, apex very shortly rounded (Fig. 2); in lateral view distinctly narrowed in apical third to pointed apex (Fig. 3). Lateral lobe (paramere) as in Fig. 4.

**Female.** Females without conspicuous external differences to males except slightly narrower pro- and especially mesotarsomeres, lack of sucker discs, and evenly curved protarsal claws. Gonocoxosternum and gonocoxae as in Figs 8 and 9.

**Variability.** Specimens of the type series vary in the extent of the brownish colouration of the lateral parts of elytra – in two specimens the brown colour shines through the lateral fourth of elytra. The antennomeres can be almost unicolorous. In some paratypes, the puncture line along the anterior margin of the pronotum is not really interrupted in the middle and the setation on the pronotal disc is indistinct, probably worn out. One male paratype varies slightly also in the shape of the male genitalia: the apical part of the median lobe is slightly shorter and in ventral view broader than in the holotype.

**Measurements.** TL 3.7–3.9 mm (holotype 3.8 mm); TL-h 3.2–3.6 mm (holotype 3.4 mm); TW 1.8–2.0 mm (holotype 1.9 mm).

**Differential diagnosis.** The new species is most similar to *Hydroporus longulus* from western Central Europe and *H. nevadensis* Sharp, 1882, which is distributed in the mountain ranges of Spain and Portugal. *Hydroporus toubkal* sp. nov. can hardly be distinguished from these species by external features alone; the shape of the median lobe of the aedeagus is the only reliable character which allows for separation of the three species (compare Figs 3, 5, and 6), a statement which also applies to most other species in the group. The median lobe of the Caucasian *H. jacobsoni* Zaitzev, 1927 resembles that of the new species, particularly in ventral view; in lateral view the differences are more obvious: the apex is distinctly broader in *H. jacobsoni* and by no means pointed (Fig. 7). Finally we want to mention two further members of the *longulus* group: *Hydroporus jurjurensis* Régimbart, 1895 from the Algerian Djurjura mountain range (the only other species of the group from northern Africa) which can be easily separated by the sharply cut apex of the median lobe (cf. GUIGNOT 1959: Fig. 348) and *Hydroporus constantini* Hernando & Fresneda, 1996 from central northern Spain whose median lobe shape is distinctly different from all species considered in the present work (cf. HERNANDO & FRESNEDA 1996: Figs 2, 5).

**Etymology.** The new species is named after the type locality, Toubkal massif of the High Atlas mountain range; the specific epithet is a noun in the nominative case standing in apposition.

**Collecting circumstances.** The specimens of the type series were collected in a spring with mosses, ca. 0.5 km below the Refuge du Toubkal “Les Mouflons” (K. Orszulik, pers. comm.). The single female from Oukaïmeden was collected in a small stream together with *Agabus biguttatus* (Olivier, 1795) and *Hydroporus discretus discretus* Fairmaire & Brisout de Barneville, 1859 (both Dytiscidae).

**Distribution.** Currently only known from the type locality, Toubkal massif (Morocco), but possibly more widespread in the High Atlas mountain range (see the single female from Oukaïmeden).

**Notes.** GUIGNOT (1947: 111 and 1959: 396) gave records of *H. longulus* from the Middle Atlas and the High Atlas respectively; KOCHER (1958: 18) also gave records from the High Atlas. We have not been able to study any material belonging to the records given by these two authors, but presume that these records may belong to *H. toubkal* sp. nov.

### Acknowledgements

We are indebted to Kamil Orszulik (Frýdek-Místek, Czech Republic) for placing specimens at our disposal. We are obliged to Ignacio Ribera (Barcelona, Spain) and Helena V. Shaverdo (Vienna, Austria) for their comments on the manuscript. This study was partly supported by the Ministry of Culture of the Czech Republic (DKRVO 2013/12, National Museum, 0002327201).

## References

- FERY H. 1999: Revision of a part of the memnonius-group of *Hydroporus* Clairville, 1806 (Insecta: Coleoptera: Dytiscidae) with the description of nine new taxa, and notes on other species of the genus. *Annalen des Naturhistorischen Museums in Wien* **101B**: 217–269.
- FERY H. 2009: New species of the *Hydroporus* longulus-group from Iran, Armenia and Turkey with a synopsis of the group (Coleoptera: Dytiscidae). *Acta Entomologica Musei Nationalis Pragae* **49**: 529–558.
- FERY H. & ERMAN Ö. K. 2009: Five new species of the longulus-group of *Hydroporus* Clairville, 1806 from north-eastern Turkey (Coleoptera: Dytiscidae). *Zootaxa* **2033**: 1–12.
- GUIGNOT F. 1947: Coléoptères hydrocanthares. *Faune de France* **48**: 1–287.
- GUIGNOT F. 1959: Revision des hydrocanthares d'Afrique (Coleoptera Dytiscoidea), deuxième partie. *Annales du Musée Royal du Congo Belge, Série 8vo (Sciences Zoologiques)* **78**: 321–648.
- HÁJEK J. & FIKÁČEK M. 2010: Taxonomic revision of the *Hydroporus* bodemeyeri species complex (Coleoptera: Dytiscidae) with a geometric morphometric analysis of body shape within the group. *Journal of Natural History* **44**: 1631–1657.
- HERNANDO C., AGUILERA P., CASTRO A. & RIBERA I. 2012: A new interstitial species of the *Hydroporus* ferrugineus group from north-western Turkey, with a molecular phylogeny of the *H. memnonius* and related groups (Coleoptera: Dytiscidae: Hydroporinae). *Zootaxa* **3173**: 37–53.
- HERNANDO C. & FRESNEDA J. 1996: *Hydroporus constantini* n. sp. de la Península Ibérica (Coleoptera, Dytiscidae). *Nouvelle Revue d'Entomologie (Nouvelle Série)* **13**: 155–161.
- KEHL S. & DETTNER K. 2007: Flugfähigkeit der in Deutschland vorkommenden adephegen Wasserkäfer (Coleoptera, Hydradephaga). (Flight ability of the adephegan water beetles (Coleoptera, Hydradephaga) of Germany). *Entomologie Heute* **19**: 141–161.
- KOCHER L. 1958: Catalogue commenté des coléoptères du Maroc. Fascicule II. Hydrocanthares, palpicornes, brachélytres. *Travaux de l'Institut Scientifique Chérifien (Société des Sciences Naturelles et Physiques du Maroc), Série Zoologique* **14**: 1–244.
- MILLER K. B. & NILSSON A. N. 2003: Homology and terminology: Communicating information about rotated structures in water beetles. *Latissimus* **17**: 1–4.

