



## ***Hydroporus sejilashan* sp. n., a new diving beetle of the *acutangulus*-complex from Xizang, China (Qinghai-Tibet Plateau), and notes on other taxa of the genus (Coleoptera, Dytiscidae, Hydroporinae)**

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### **Abstract**

*Hydroporus sejilashan* sp. n. is described from Xizang Autonomous Region (Qinghai-Tibet Plateau), China. It belongs to the *acutangulus*-complex of the *Hydroporus planus*-group and can be separated from all four other members of the species complex by the completely distinctly matt surface in both sexes. In addition it can be distinguished from *Hydroporus acutangulus* Thomson, 1856 and *H. polaris* Fall, 1923 by the shape of the anterior protarsal claw, which is strongly curved near the base and more straight distally in the latter two species, but evenly curved in the new species and in the other two species of the complex, namely *H. tibetanus* Zaitzev, 1953 and *H. tuvaensis* Pederzani, 2001. The habitus of all five members of the complex are provided, along with illustrations of the male and female genitalia of the new species and those of *H. tibetanus*. The lectotype of *H. sumakovi* Poppius, 1912, a taxon which until now has been treated as a junior synonym of *H. acutangulus*, is designated. Preliminary studies reveal that *H. sumakovi* is probably more closely related to *H. polaris* than to *H. acutangulus*. Older, doubtful previous records of *Hydroporus nigellus* Mannerheim, 1853 from China are confirmed with new records from Qinghai and Sichuan Provinces. Twelve species of the genus *Hydroporus* Clairville, 1806 are now known from China, only two of which occur in Tibet.

**Key words:** Coleoptera, Dytiscidae, Hydroporinae, *Hydroporus acutangulus*-complex, new species, lectotype, first record, China, Tibet

### **Introduction**

In 2009 the senior author collected a series of *Hydroporus* in Xizang Autonomous Region in western China, which obviously belongs to the *acutangulus*-complex of the *Hydroporus planus*-group, and it was impossible to assign it undoubtedly to any known species of the genus. After a careful study of specimens, including most types of all other species of that complex, we decided to describe the species as new under the name *Hydroporus sejilashan* sp. n.

The genus *Hydroporus* Clairville, 1806 is distributed in the Nearctic, Neotropical and Palearctic zoogeographical regions. It comprises about 180 species, but only a few are known from China. Nilsson (1995: 52, 53) listed 10 of them for China: *Hydroporus acutangulus* Thomson, 1856, *H. angusi* Nilsson, 1990, *H. brevisculus* Poppius, 1905, *H. discretus* Fairmaire & Brisout, 1859, *H. glasunovi* Zaitzev, 1905, *H. goldschmidti* Gschwendtner, 1923, *H. penitus* Guignot, 1945, *H. submuticus* Thomson, 1874, *H. tibetanus* Zaitzev, 1953, and *H. uenoi* Nakane, 1963. In the same work Nilsson (1995: 53) doubted records of *Hydroporus nigellus* Mannerheim, 1853 from China by Feng (1932: 25) and Wu (1937: 209) (in both works given under the name *Hydroporus obscuripes* (Motschulsky, 1860)). Nilsson recorded also *Hygrotus discedens* (Sharp, 1882) from China, a taxon shown to belong to the genus *Hydroporus* by Fery (2000). Due to secondary homonymy with *Hydroporus discedens* Régimbart, 1877 (a junior subjective synonym of *Hydroporus incognitus* Sharp, 1869) that name was replaced by *Hydroporus hygrotoides* Fery, 2000. Since 1995 one new species was described (*Hydroporus nanpingensis* Toledo & Mazzoldi, 1996), *H. penitus* proved to be a junior subjective synonym of *H. submuticus* (see Nilsson *et al.* 1999: 113), and *H. acutangulus* is not any more treated as member of the Chinese fauna (Nilsson 2011). Finally we can provide three verified records of *H. nigellus* from China and, thus, together with *H. sejilashan* sp. n. we have now a total of 12 *Hydroporus* known from China, of which only two occur in Tibet (*H. tibetanus* and the new species).

## Material and methods

The following codens are used for collections from which we have studied specimens:

CAP	coll. A. Pütz, Eisenhüttenstadt, Germany
CGC	coll. G. Challet, California, USA
CHF	coll. H. Fery, Berlin, Germany; property of the NMW
CHH	coll. H. Hebauer, Rain, Germany
CHS	coll. H. Shaverdo, Vienna, Austria; property of the NMW
CJH	coll. J. Hájek, Prague, Czech Republic
CJS	coll. J. Šťastný, Liberec, Czech Republic
CLH	coll. L. Hendrich, Munich, Germany; property of the NMW
CNC	Canadian National Collection, Ottawa, Canada (A.E. Davies, P. Bouchard)
CPM	coll. P. Mazzoldi, Brescia, Italy
FMNH	Finnish Museum of Natural History, Helsinki, Finland (O. Biström)
MNB	Museum of Natural History, Berlin, Germany (M. Uhlig, B. Jaeger, J. Willers)
NMB	Natural History Museum of Basel, Switzerland (M. Brancucci)
NMW	Natural History Museum Vienna, Austria (M.A. Jäch)
SYSU	Sun Yat-sen University, Guangzhou, China (H. Pang)
ZISP	Zoological Institute, Russian Academy of Sciences, St. Petersburg, Russia (A.G. Kirejtshuk)

The following abbreviations are used in the text: TL: total body length; TL-H: total length without head; MW: maximum body width. Male aedeagi and female gonocoxosterna and gonocoxae were studied in wet condition with an Olympus SZX16 stereomicroscope. Photos of habitus were taken with a Nikon Coolpix 995 camera attached to the stereomicroscope and then touched up by application of CombineZM Image Stacking Software. The terminology used to denote the orientation of the male genitalia follows Miller & Nilsson (2003). The maps (Figs. 13–14) are made by using "Microsoft Encarta World Atlas 2000". Co-ordinates are given in decimal notation. Author's remarks and complementary data are given in square brackets.

## Systematics

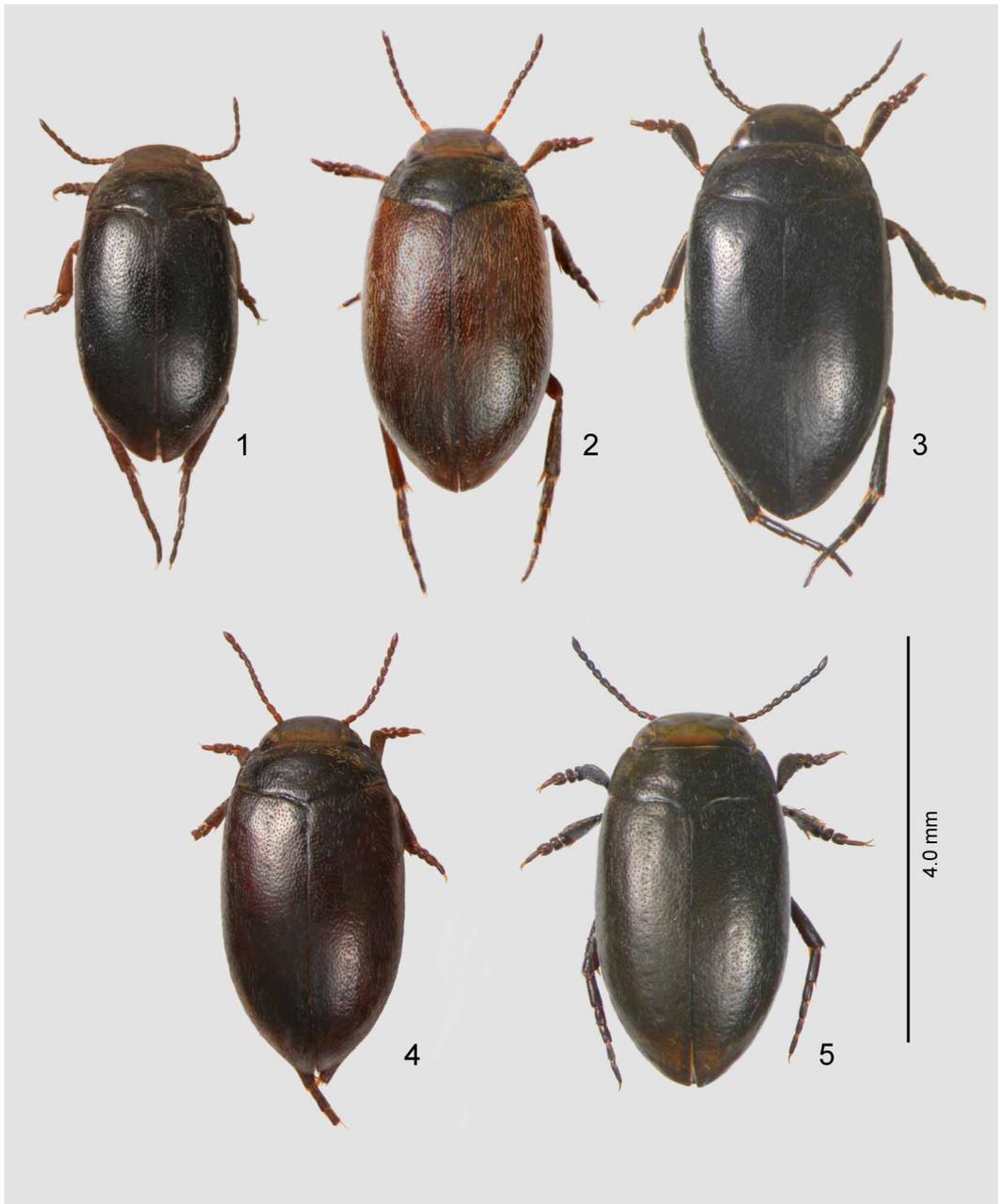
The new species belongs to the *acutangulus*-complex of the *planus*-group of the genus *Hydroporus*. Although Nilsson (2001) preferred the term "*fuscipennis*-group", we use instead the term "*planus*-group", which was coined by Zimmermann (1931) and used since then in most of the relevant works on this group (for further arguments see Fery & Petrov 2006: 83). As far as can be determined, Pederzani (2001) was the first who introduced the term "*acutangulus-polaris* species complex" which later was also used by Shaverdo (2004). We see, however, no necessity to use a term which includes the names of two species and prefer the term "*acutangulus*-complex".

The *planus*-group members share the following combination of characters: (1) pronotum with lateral bead broad, (2) elytron with reticulation in most species reduced and (3) with lateral margin weakly ascending to humeral angle, (4) metacoxal processes with posterior margin conjointly truncate (see e.g. Nilsson & Holmen 1995: 45, but under the name *fuscipennis*-group). To exclude members of the *marginatus*- and *sibiricus*-groups from the *planus*-group, Shaverdo & Fery (2001: 33) added two further characters: (5) punctuation on elytra less dense, distance between punctures larger than their diameter and (6) base of pronotum not considerably wider than base of elytra.

The members of the *acutangulus*-complex are additionally characterised by (cf. Shaverdo 2004: 260) (7) metacoxal lines subparallel, intralinear space covered with dense setae, (8) male metatrochanters posteriorly with dense setal fringe (cf. fig. 2 in Pederzani 2001).

Shaverdo (2004: 260) listed another feature: "elytral disc without microreticulation, with indistinct microreticulation on side and in posterior third". However, this feature does not hold up since the new species is distinctly reticulate on the entire elytra (as well as both sexes of *Hydroporus polaris* Fall, 1923) and, additionally, females of *H. acutangulus* sometimes have the elytral reticulation rather extended. Such dimorphism is also known from other members of the *planus*-group: females of *Hydroporus fuscipennis* Schaum, 1868 and *H. goldschmidti*

usually have the elytra smooth, but sometimes distinctly reticulate. Members of the *acutangulus*-complex are often described as "with dense, erect, golden setae" on the space between the metacoxal lines (e.g. Nilsson & Holmen 1995: 48, Shaverdo 2004: 260), however, if not prepared properly, these setae are mostly not erect, but attached to the ventral surface and the "gold" is often a rather whitish one. Refer also to Fall (1923: 92), who provided for *H. polaris* "dense appressed pubescence between the coxal lines" and Zimmermann (1931: 139), who wrote: "Raum zwischen [den Koxallinien] ... mit einem aus kurz anliegenden, goldgelben Haaren gebildeten Filzstreifen bekleidet." [= area between the coxal lines having a fringe of shortly attached golden-yellowish hairs]. Those setae may be also rubbed off (cf. Larson *et al.* 2000: 349).



**FIGURES 1–5.** Habitus of: (1) *Hydroporus acutangulus*, (2) *Hydroporus polaris*, (3) *Hydroporus tuvaensis*, (4) *Hydroporus tibetanus* (lectotype), (5) *Hydroporus sejilashan* sp. n.

The five species of the *acutangulus*-complex can be grouped in three subcomplexes which are geographically isolated. For a better understanding of the following remarks, we recommend to look at the first map (Fig. 13):

- *Hydroporus acutangulus* and *H. polaris* (circles and squares, respectively, in Fig. 13) are two northern species which seem to prefer areas of lower altitudes; both species have anterior protarsal claws which in lateral view are broadened and strongly curved near the base and rather straight more distally.
- *Hydroporus tuvaensis* (triangle in Figs. 13–14) is a Central Asian species (Russia, Tuva region; possibly also in Mongolia), which seems to prefer higher altitudes (800–1000 m) and has the anterior protarsal claw more or less evenly curved and similar to the posterior one.
- *Hydroporus tibetanus* and *H. sejilashan* sp. n. (stars and encircled star, respectively, in Figs. 13–14) are two species from the Qinghai-Tibet Plateau living at altitudes above 4000 m. Both species have simple anterior protarsal claws (as in *H. tuvaensis*).

A revision of the *acutangulus*-complex was not the aim of our investigations. Our work should be considered as a further step to a more thorough understanding of the complex and, thus, we present only the distinguishing characters of the five species after the description of *H. sejilashan* sp. n. Intensive future collecting activities and the application of molecular methods are needed to establish the phylogeny of the complex and its correct placement inside the *planus*-group.

### ***Hydroporus sejilashan* sp. n.**

**Type locality:** China, Xizang Autonomous Region, ca. 20 km SEE Linzhi [= Nyingchi], Sejilashan mountains; ca. 29.62N 94.60E, altitude ca. 4100–4200 m.

**Type material: Holotype:** ♂, "China, Xizang (Tibet), Linzhi, Sejilashan mountains, ca. 29.62N 94.60E, 4100–4200 m, 12.–18.8.2009, leg. Fenglong Jia" [printed], a further label with same text, but with Chinese letters, "Holotype, *Hydroporus sejilashan* sp. n., Jia, Zhao & Fery det." [red, printed] (SYSU). **Paratypes:** 121 exs, same label data, but with the respective red paratype label (SYSU, CGC, CHF).

**Habitus** elongate oval (Fig. 5), appearing slightly parallel-sided; maximum width behind middle of total length, more or less in middle of elytral length. Dorsal and ventral surface almost entirely black, microreticulated and matt. Pronotum at posterior angles slightly broader than elytra at base (but by far not so distinctly broader than in the members of the *sibiricus*-group), thus, outline in dorsal view here with a slight discontinuity.

**Head** black, with indistinct transverse dark brownish marking near anterior margin of clypeus and on vertex; above antennal cavity indistinct transparent brownish spot. Interocular distance distinctly smaller than half of pronotal width at posterior angles. Between eyes with two nearly triangular clypeal grooves. Reticulation of head distinct, on large parts with even, polygonal, more or less isodiametric meshes; at anterior margin and on vertex transversely elongate; in clypeal grooves meshes smaller and more strongly impressed. Punctuation sparse, absent on vertex, diameter of punctures equalling that of meshes on clypeus; in clypeal grooves punctuation coarser and denser; next to inner margin of eye with a distinct line of impressed punctures. Setation absent. First and second antennomeres dark brown; third and fourth proximally dark brown, distally black; rest of antennomeres black. First maxillary and labial palpomeres reddish brown, others largely darkened. Third and fifth antennomeres rather short, fourth still shorter, almost as wide as long; fifth to eighth about one and a half times as long as wide, ninth and tenth somewhat longer, eleventh more than two times longer than wide.

**Pronotum** entirely black. Maximum width between posterior angles; in dorsal view sides almost straight in posterior two thirds, before curved to anterior angles. Lateral bead broader than half of diameter of antennomeres, more or less of same width over entire length. Between disc and posterior margin pronotum slightly impressed over about half of its width, thus, disc appearing somewhat vaulted; with shallow impression at posterior angles. Surface rather uniformly reticulated, meshes more or less of same diameter as on clypeus; in posterolateral impressions somewhat smaller. Punctuation on disc similar to that on clypeus and frons, behind and towards sides coarser and slightly denser; middle of pronotum with a very large puncture; near anterior margin with several finer punctures,

behind them a line of irregularly placed rather coarse punctures perceptible. Most punctures provided with a transparent whitish, rather long seta (ca. 0.05 mm).

**Elytra** entirely black as pronotum; surface appearing slightly more matt than on head and pronotum. Base of elytra slightly narrower than pronotal base. In dorsal view sides of elytra rather weakly curved in anterior two thirds, behind stronger curved to apex. In lateral view elytral margin very slightly ascending towards humeral angle, straight directly before angles, far behind slightly curved; epipleuron visible until humeral angle; elytral bead distinctly thinner than pronotal bead, in lateral view both forming an angle at bases of pronotum and elytra. Reticulation on elytra more or less uniform, meshes larger than those on pronotum. Punctuation also rather uniform, punctures sparse, coarser than those on head and disc of pronotum; diameter of punctures same as that of meshes; punctures spaced approximately three to four puncture widths apart. Near sides punctures somewhat smaller and still sparser. Puncture lines almost imperceptible, only visible when adequately illuminated; indicated by slightly enlarged and/or more closely placed punctures; each elytron with two discal lines and one sublateral line; in anterior half elytra alongside first (inner) line additionally slightly impressed. Sutural puncture line absent. Setation distinct, similar to that on pronotum.

**Ventral surface** almost entirely black, including gula. Mouthparts, pro- and mesocoxae, and apex of metacoxal processes dark brownish; apex of prosternal process, hind margins of fourth to sixth abdominal ventrites narrowly transparently brownish. Genae distinctly reticulate, but shiny; gula smooth, with some coarse punctures. Prosternal process with blade narrowly lanceolate, in cross-section tectiform; sides not flattened, coarsely punctured and with long setae; margin beaded; apex not distinctly pointed, narrowly rounded; between procoxae with a weak protuberance, before protuberance with a few transverse carinae; anteriorly process not prolonged as narrow convexity onto prosternum. Prosternum anteromedially flat and very rugosely sculptured. Posterior margins of metacoxal processes straight and forming more or less one line together. Metacoxal lines subparallel, reaching posterior margin of metaventrite. Large parts of ventral surface reticulated, but appearing not so matt as upper surface; meshes mostly elongate, often weak and incomplete, only on last two abdominal ventrites more impressed; centre of metaventrite smooth. Sides of metaventrite, metacoxal plates, and first two abdominal ventrites with coarse, but not very dense punctuation; smooth centre of metaventrite with sparse and fine punctures; elytral epipleura and third and fourth abdominal ventrites also sparsely covered with fine punctures; on last two ventrites punctures again coarser. Middle of third to fifth ventrite with one shallow large puncture, with several very long setae originating in it. Almost all other punctures on ventral surface bearing one rather long transparent seta. Intralinear space of metacoxal processes covered with very dense setae; this setal area prolonged anteriorly onto small posteromedial area on metaventrite (this area much more developed anteriorly than illustrated for *H. acutangulus* in fig. 88 of Nilsson & Holmen 1995: 49).

**Legs** with all trochanters and pro- and mesotibiae dark reddish brown, metatibiae somewhat darker; femora black, proximal and distal ends indistinctly brownish. Tarsomeres more or less of same colour as respective tibiae, proximally indistinctly lighter.

**Measurements:** Holotype: TL: 3.2 mm, TL-H: 3.0 mm, MW: 1.7 mm, TL/MW: 1.88. Paratypes: TL: 3.1–3.5 mm, TL-H: 3.0–3.2 mm, MW: 1.65–1.75 mm, TL/MW: 1.88–1.89.

**Males:** Median lobe of aedeagus in ventral (a) and lateral (b) view as in Fig. 6; left paramere as in Fig. 7. For comparison those of *H. tibetanus* are illustrated in Figs. 8–10. First three tarsomeres of male dilated; second one rather short, length only one half of width; third more or less as long as wide, outline almost circular; fifth indistinctly longer than fourth. First and second pro- and mesotarsomeres with sucker hairs and a few additional elongate oval sucker cups. Anterior protarsal claw indistinctly broader than posterior one, both more or less similarly shaped and evenly curved. (anterior one not thickened at base and here not strongly arcuate, and then straight as in *H. acutangulus*.) Margin of pro- and mesotrochanters with a short line of approximately six coarse punctures, each with a rather long seta. Hind margin of metatrochanter with a conspicuous fringe of light yellowish setae.

**Females:** Similar to males, but pro- and mesotarsomeres less dilated, without sucker cups, and metatrochanters lacking setal fringe. Reticulation on ventral surface more impressed than in males, almost all meshes complete, smooth area on centre of metaventrite absent or very strongly reduced. Gonocoxosternum and gonocoxae as in Figs. 11–12.

**Variability:** There is little variability in *H. sejilashan* sp. n. The brownish parts on the ventral surface are sometimes more extended. Third and fourth antennomeres are sometimes almost black, similar to following ones. The puncture lines on elytra are in some specimens more perceptible. The base of the pronotum is in some males

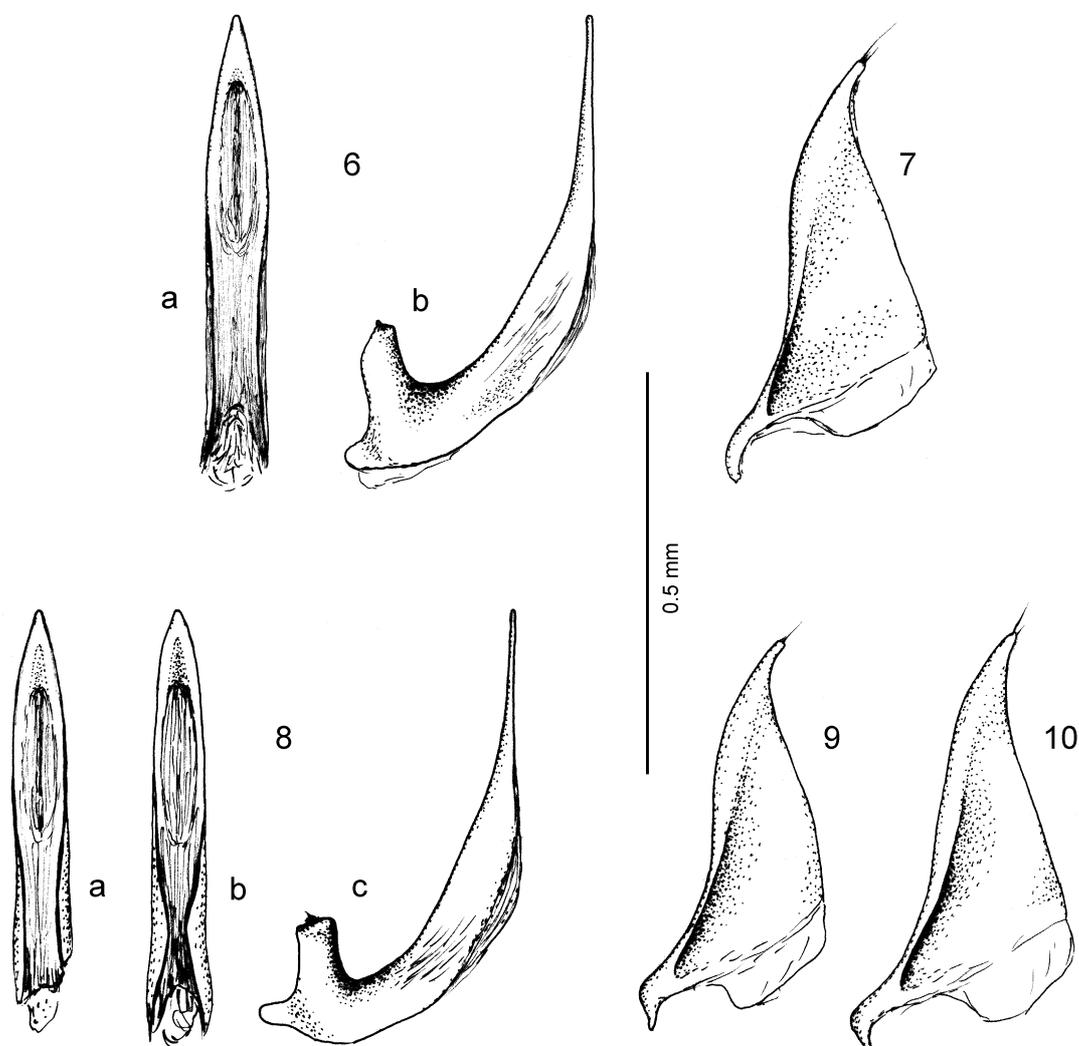
only slightly broader than the base of the elytra; this is also the case in about half of the females. The shape of the metacoxal lines also varies a little: in some cases these are slightly diverging shortly before hind margin of the metacoxal plates, in others slightly converging.

**Notes:** Due to the matt surface, fine punctation and weak puncture lines of the elytra, the new species at first glance resembles a dark *Hydroporus nigellus* Mannerheim, 1853 (belonging to the species-group of the same name) but not any of the members of the *acutangulus*-complex nor a single one of the *planus*-group. An inspection of the dorsal and ventral surfaces of the new species (of males as well as females), however, readily shows that it belongs to the *acutangulus*-complex—rather broad pronotal lateral bead, subparallel metacoxal lines, strong setation on their intralinear space, and a striking setal fringe on the hind margin of the male metatrochanters.

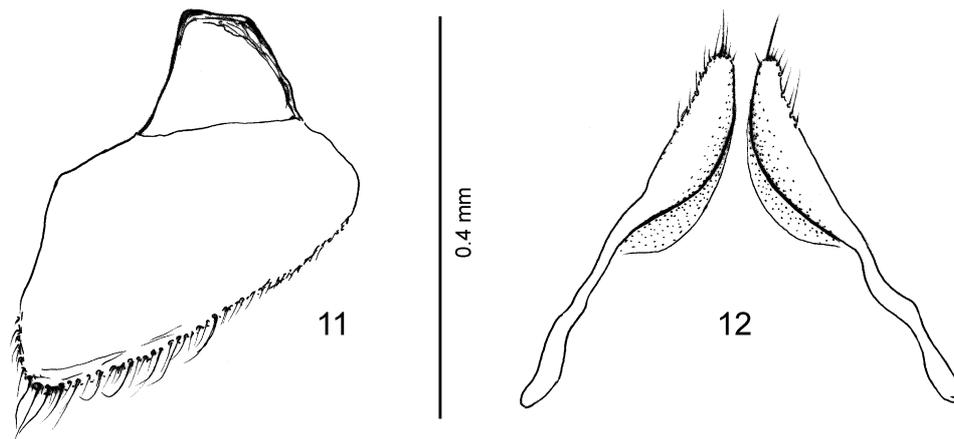
**Distribution:** Eastern Qinghai-Tibet Plateau; so far *H. sejilashan* sp. n. is only known from the type locality.

**Etymology:** The new species is named after the mountain range Sejila Shan where it has been found. It is a noun in the nominative case in apposition.

**Ecology:** The collecting area in the Sejilashan Mountains is covered by swamps with dense bushes and grass in altitudes of 4100–4260 m. In addition, several shallow pools can be found which are due to Yak activities. The new species was found in swamps with dense vegetation, and shallow pools of stagnant and very clear water with only sparse vegetation; some specimens were collected under grass roots. It was always found together with *Boreonectes emmerichi* (Falkenström, 1936).



**FIGURES 6–10.** (6) Median lobe of *Hydroporus sejilashan* sp. n. in ventral (a) and in lateral view (b); (7) left paramere of *Hydroporus sejilashan* sp. n.; (8) median lobe of *Hydroporus tibetanus* in ventral view: (a) lectotype, (b) specimen from Ganzi; same in lateral view: (c) specimen from Ganzi; left paramere of *Hydroporus tibetanus*; (9) specimen from Ganzi, (10) lectotype.



FIGURES 11–12. *Hydroporus sejilashan* sp. n.: (11) gonocoxosternum, (12) gonocoxae.

### Notes on other members of the *acutangulus*-complex and comparison with *H. sejilashan* sp. n.

#### *Hydroporus tibetanus* Zaitzev, 1953

*Hydroporus tibetanus* was described by Zaitzev (1953: 169; see also the English translation Zaitzev 1972: 179) from Amdo (China, Qinghai [Tibet]; ca. 32.27N 91.68E; altitude ca. 4700 m; star "a" in Figs. 13–14) as "closely related to" *Hydroporus nigrita* (Fabricius, 1972) and, thus, was treated as member of the *nigrita*-group by Nilsson (2001: 163). Zaitzev seemingly overlooked the shape of the metacoxal lines and the setation on the metatrochanters; he wrote "... dorsum and venter more shining; body markedly more weakly shagreened [compared with *H. nigrita*] ..." Shaverdo (2004: 260) studied the two syntypes of *H. tibetanus* (ZISP), designated a male lectotype (Fig. 4) and found out that—due to the widely smooth elytra—this species belongs to the *planus*-group and, in particular, to the *acutangulus*-complex because of the parallel metacoxal lines and the setal fringe on each metatrochanter. We have also studied the types of this taxon and can confirm Shaverdo's observations, but want to add that the base of the median lobe as well as the right paramere of the lectotype are both damaged. Additionally, it must be mentioned that the lectotype lacks the posterior claw of the left protarsus (the anterior claw is present and clearly not strongly curved near base), the anterior claw of the right protarsus, the last three tarsomeres of the left mesotarsus, the last three tarsomeres of the left metatarsus and the complete right metatarsus. We want to point to the fact that the lectotype is reticulated more or less as typical *H. acutangulus*: entire surface shiny; pronotum smooth on disc, reticulate laterally; elytra smooth in first third, behind with some indistinct short lines between punctures, before apex with distinct small meshes, but also here not matted. In the female paralectotype the elytral reticulation with small meshes is already present in the second third and becomes more impressed towards the apex; the smooth areas on the pronotum are even more extended than in the male. The entire upper surface appears by no means less shiny than that of the male.

After Zaitzev's description (1953), no subsequent specimens of *H. tibetanus* have been collected. The species was only listed in some catalogues (Hua 2002, Nilsson 1995, 2001, 2003, 2011, Nilsson & Fery 2006) or treated in overviews of members of the *nigrita*- or *planus*-groups (Fery & Pesic 2006, Guéorguiev 1966, Shaverdo 2004). Recently, however, we have studied several specimens which we could determine as this species. The collecting data are as follows: 3.7.1999, Sichuan, Ganzi (= Garzê) Tibetan Autonomous Region, Batang County, Shaluli Mountains, 57 km NE Batang, pools, ca. 4500 m, A. Pütz leg. (CAP, CHF) (star "b" in Figs. 13–14). These specimens are similar to the lecto- and paralectotype of *H. tibetanus* in most respects, in particular, their upper surface is shiny in both sexes. They are, however, somewhat darker than the types. Some females are reticulated on the entire elytra and large parts of the pronotum. Other females have the upper surface reticulated as the female paralectotype of *H. tibetanus*. The median lobe of the males in ventral view (Fig. 8b) is similar to that of the lectotype of *H. tibetanus* (Fig. 8a). We are not absolutely sure about the identity of Pütz' specimens, but since no

other material from the region around Amdo has become available, we assume that this population belongs to *H. tibetanus*. Measurements: Lectotype (male): TL: 3.2 mm, MW: 1.6 mm, TL/MW: 2.00; paralectotype (female): TL: 3.2 mm, MW: 1.65 mm, TL/MW: 1.94; specimens from Ganzi: TL: 2.95–3.3 mm, MW: 1.5–1.7 mm, TL/MW: 1.9–2.03.

We prefer not to present a key to species at this time because any key for this group would be rather primitive and not very useful. Construction of a key for this species group should be postponed until the variability of all group members is known sufficiently. We compare below the new species with the types of *H. tibetanus* as well as with specimens from the population of *H. tibetanus* from Ganzi:

- *Hydroporus sejilashan* sp. n. is larger and slightly less elongate than *H. tibetanus*.
- In dorsal view the sides of the pronotum are less curved in *H. sejilashan* sp. n. In *H. tibetanus* the base of the pronotum is not broader than the base of the elytra.
- The new species has the entire surface reticulated and matt. *Hydroporus tibetanus* has a shiny surface (also in reticulated areas) and in the males and most females the reticulation of the elytra is restricted to the apex.
- *Hydroporus sejilashan* sp. n. has the dorsal and ventral surface almost totally black, only the tarsi and first antennomeres are dark brownish. The lectotype of *H. tibetanus* has the tarsi somewhat lighter, the antennomeres are all more or less uniformly brown, and the elytra are dark brown; the female paralectotype and the specimens from Ganzi, however, are generally darker than the lectotype.
- The punctation of the surface is distinctly coarser in *H. tibetanus*, and also denser on head; in the posterolateral depression of the pronotum and before the posterior margin (except centrally) it is very coarse and longitudinally deformed; the punctures of the irregular puncture line behind the anterior pronotal margin are also very coarse and in part longitudinally deformed. In the new species, however, the punctation is generally simple and by far not so coarse in the respective areas. Due to the coarser elytral punctation, the elytral puncture lines appear slightly less distinct in *H. tibetanus*.
- The first three protarsomeres are more dilated in *H. sejilashan* sp. n.; especially the second protarsomere is almost two times as broad as long and the third one more or less of round shape; the differences between male and female protarsomeres are obvious. In the lectotype of *H. tibetanus* the second protarsomere is only one and a half times as broad as long and the third one is more elongate; differences between the protarsomeres of males and females are rather slight. The male mesotarsomeres of the new species are also broader than those of the females and broader than those of *H. tibetanus*.
- Antennomeres five to eleven are slightly longer in the new species.
- The median lobe of *H. sejilashan* sp. n. is in ventral view slightly narrower in the apical third and more pointed (compare Figs. 6a with 8a–b). In lateral view (Fig. 6b) a comparison is impossible because the median lobe of the lectotype of *H. tibetanus* is partly destroyed. A comparison with that of a male from Ganzi (Fig. 8c) shows that the lobe of the new species is less bent near the base and slightly broader in apical third.

### ***Hydroporus acutangulus* Thomson, 1856**

The species was described by Thomson (1856: 202) after specimens from northern Sweden, "Lappland" (very roughly estimated to 67N 26E; circle (1) in Fig. 13). The type localities of the five other known synonyms are also given as circles in Fig. 13: (2) *Hydroporus punctatulus* J. Sahlberg, 1889 (Russia, Kola peninsula, Chavanga; 66.113N 37.777E); (3) *H. sumakovi* (Russia, Novaya Zemlya, Belushya Guba; 71.535N 52.327E) (circle with question mark, see notes below); (4) *H. pectoralis* (Russia, Siberia, Neuleva river, Spirino; 61.167N 69.814E); *Hydroporus zaitzevi* Jacobson, 1908 is a replacement name for *H. pectoralis* and, thus, has the same type locality as

the latter; (5) *H. aenescens* (Russia, Siberia, Yenisei, Bryokhovskiy Island, ca. 70.83N 83.00E, and Nikandrovskiy Island, ca. 70.67N 83.00E). For more details about the taxa mentioned above see Nilsson (2001) and the comprehensive discussion in Falkenström (1929: 151). We have studied several specimens from Sweden, Finland, northern Norway and Russia (Republic of Karelia) (MNB, CHF). In addition we have studied the male from the Russian Far East, Primorsky krai, Ussuriysky Rayon, Kaimanovka, ca. 43.63N 132.24E (CLH; circle 6 in Fig. 13) which has been cited in Pederzani (2001: 236). *Hydroporus acutangulus* is almost entirely black or has the elytra very dark brownish (Fig. 1); all specimens studied appear at least darker than those *H. polaris* which are at our disposal. The males have the elytra shiny and not reticulate behind the base; however, in the posterior part of the first third, traces of reticulation can be found: not complete meshes, but short indistinct lines between the punctures. More distally, this reticulation becomes more prominent, and near the apex it is replaced by small complete meshes. In the northern European males studied the pronotum is reticulated with small meshes, except a small area on disc. In the male from the Russian Far East this smooth area is extended more to the sides and reaches until the base. Females often have distinct reticulation on large parts of the upper surface (Nilsson & Holmen 1995: 48), but are, nevertheless, shiny. Further comparative notes can be found below under *H. polaris*. The species can be easily distinguished from *H. sejilashan* sp. n. by the arcuate anterior protarsal claws (males) and the shiny surface.

### ***Hydroporus polaris* Fall, 1923**

Fall (1923: 92) described this species from two males and one female from Bernard Harbour (Nunavut, Canada, ca. 68.788N 114.82W; square 9 in Fig. 13). In the same work Fall (1923: 93) described *Hydroporus subvirescens* after specimens collected at Cape Collinson (Alaska, USA, ca. 69.986N 144.861W; square 8 in Fig. 13). He provided for this taxon the following features: "with evident viridi-aeueous surface lustre" on the elytra and a "distinctly alutaceous and dull" upper surface. Additionally, he wrote: "Front tarsi of male moderately dilated, its anterior claw not appreciably different from the posterior." We have studied the male holotype and the female paratype of *H. polaris* as well as the male holotype of *H. subvirescens* (all in CNC). To our great surprise, the holotype of *H. polaris* has a "distinctly alutaceous and dull" upper surface with a well visible metallic sheen on the elytra (sic!), while the holotype of *H. subvirescens* has a shiny (although reticulate) surface and does not show any metallic sheen. In addition, both male holotypes have the anterior protarsal claws clearly strongly curved near the base and in the more distal part straight. While the appearance of the shape of the protarsal claws depends somewhat on their orientation and can be misinterpreted, this is not true of the reticulation and sheen of the dorsal surface. Thus, we must assume that either Fall himself or any person who dealt with these types after Fall has mixed up both holotypes by mistake. But we made yet another interesting observation: the dull appearance and the metallic sheen can be easily removed mechanically, for instance by means of a brush with hard hairs (tested in a very small area of the elytra). We agree with Larson *et al.* (2000: 348) who have synonymised *H. subvirescens* with *H. polaris*.

One of the main differences between *H. polaris* and *H. acutangulus* is the reticulation which is present in males and females of the former on the entire upper and ventral surface, while only present in some females of the latter. The colouration of the upper surface is varying between lighter and darker brown in *H. polaris*, but generally more brownish than in the mostly blackish *H. acutangulus* (compare Figs. 1–2). Additionally, we want to report an observation that we have not found in the literature: the shape of the metacoxal lines is rather variable in *H. polaris*; sometimes, they are only slightly impressed far before reaching the posterior margin of the metaventricle and often vanish there. If they reach that margin, they are in some specimens converging anteriorly, and not parallel.

Nilsson & Holmen (1995: 48) suspected that *H. acutangulus* and *H. polaris* might be conspecific and reported *H. polaris* from the "extreme north-east of Siberia (Wrangel Island, coll. G. Lafer)" (square 7 in Fig. 13) which is "identical with Nearctic material". Larson *et al.* (2000: 350) listed several characters which separate *H. acutangulus* from *H. polaris* and conclude: "Unless it is shown that these characters vary clinally across northern Asia, the differences are sufficient to justify the recognition of two species." We would refrain from confirming the thesis that *H. polaris* and *H. acutangulus* are not conspecific, we can confirm, however, most statements of Larson *et al.* (2000: 349, 350), except one: *H. acutangulus* appears not to be broader than *H. polaris*, on the contrary, the latter species appears to be broader, and this is due chiefly to the more rounded body shape of *H. polaris* (see Figs. 1–2). Our measurements yielded for *H. polaris* the following values: TL: 3.1–3.4 mm, MW: 1.5–1.7 mm, TL/MW: 1.88–2.00 (Pederzani 2001: 238 provided similar values: TL: 3.15–3.35 mm, TL/MW: 1.88–2.00). The *H.*

*acutangulus* studied are distinctly smaller: TL: 2.8–3.0 mm, MW: 1.45–1.5 mm, TL/MW: 1.93–2.00 (Pederzani 2001: 238 provided: TL: 2.90–3.23 mm, TL/MW: 1.83–2.07).

We want to add that at least those *H. acutangulus* from northern Europe and the Nearctic *H. polaris* which we have studied appear externally absolutely different, the *H. acutangulus* being smaller and distinctly more elongate because the sides of the body are rather parallel, while the *H. polaris* have evenly rounded sides and at a first glance look like a *Hydroporus transgrediens* Gschwendtner, 1923, or a small *Hydroporus planus* (Fabricius, 1782). If one compares the habitus photos of both species (Figs. 1–2) it is hardly believable that both taxa shall belong to one and the same species and that characters shall vary clinally so strongly across northern Asia.

Like *H. acutangulus*, this species can be also easily distinguished from *H. sejilashan* sp. n. by the arcuate anterior protarsal claws (males) and, additionally, by the colouration of the upper side.

### ***Hydroporus tuvaensis* Pederzani, 2001**

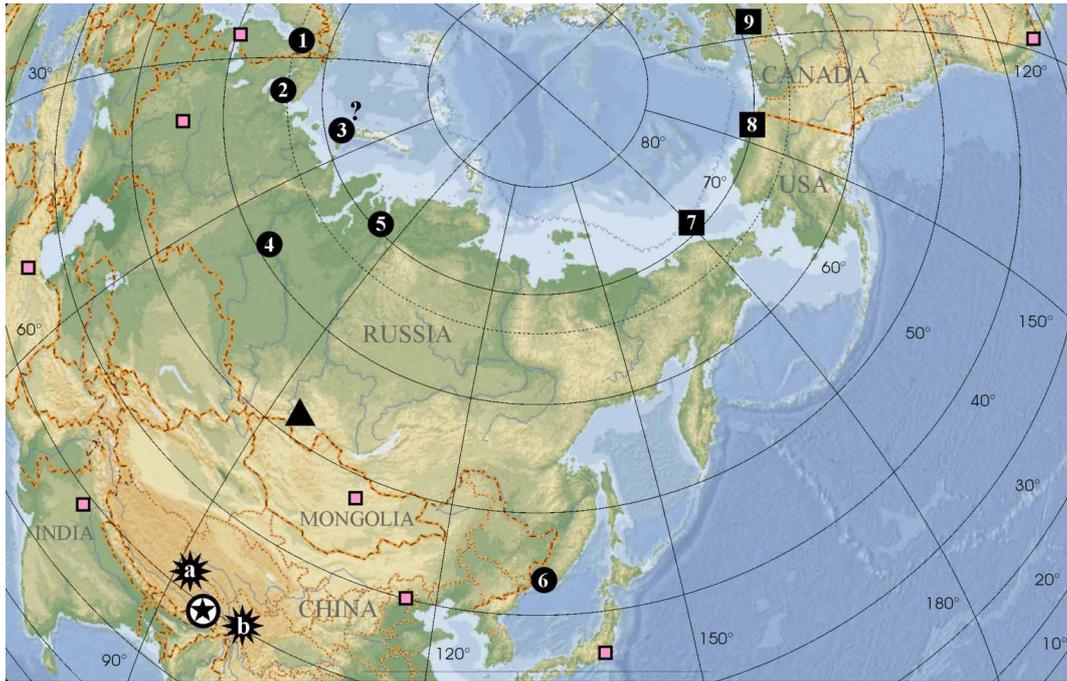
This species was described by Pederzani (2001: 234) after a small series of specimens from Sush village (ca. 52.05N 94.17E), ca. 50 km NW Kizyl city, Tuva district, Russia, and about 200 km north of the border to the eastern part of Mongolia; altitude ca. 800–1000 m (triangle in Figs. 13 and 14). We had the opportunity to study one male paratype (Fig. 3) and two female paratypes (CHH, CHF). This is the largest of the five species of the complex (Pederzani 2001: 238 provided: TL: 3.70–3.88 mm, TL/MW: 1.94–2.03). Additionally, it has the entire upper surface shiny and, thus, cannot be mixed up with *H. sejilashan* sp. n. As in *H. tibetanus* and *H. sejilashan* sp. n. the anterior protarsal claw is simple and more or less shaped as the posterior one. Pederzani (2001: 216) reported seven females from Mongolia with doubtful identities, which are distinctly smaller than the "normal" *H. tuvaensis*. We have studied these and a few further similar specimens (CHF, CHS, CJH, NMB) from that region—including males—and are not yet sure about their identity.

### **Designation of the lectotype of *Hydroporus sumakovi* Poppius, 1912**

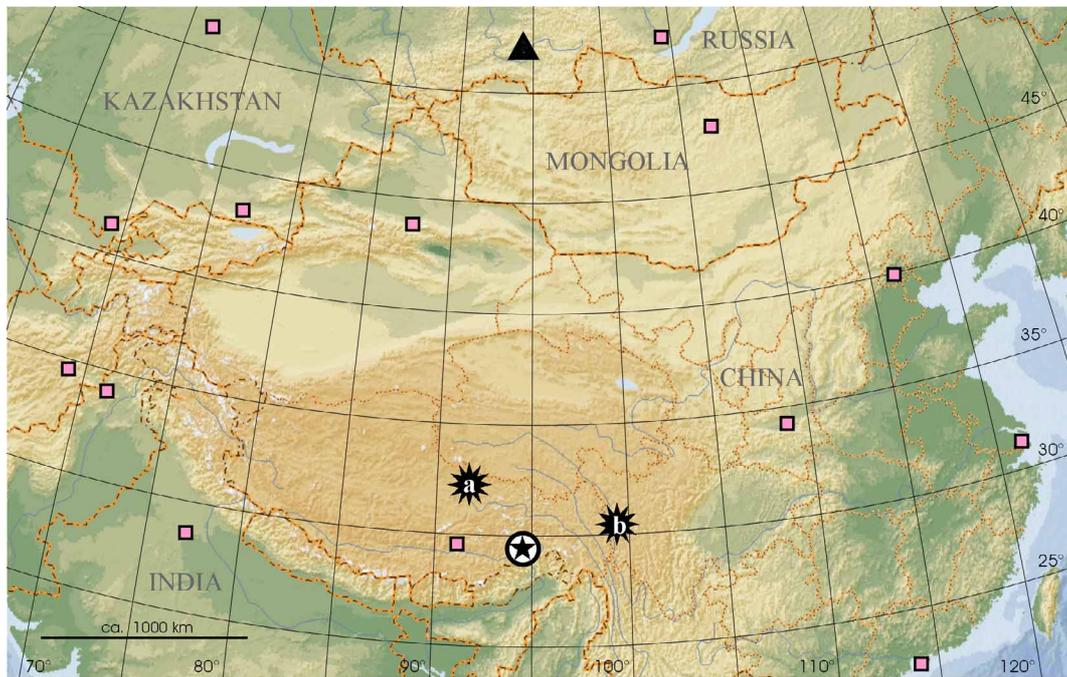
Poppius (1912: 107) described this taxon after two specimens collected by G. Sumakov on the Novaya Zemlya archipelago (Russia) (circle 3 with question mark in Fig. 13). This taxon is usually treated as a junior subjective synonym of *H. acutangulus* (Zimmermann 1931: 139; Zaitzev 1953: 168, 1972: 177). We have studied one syntype from the FMNH (see also Biström 1987: 37) and want to take the opportunity to designate the lectotype of this taxon: **Lectotype** (by present designation): ♂, "N. Semlja [Latin], Belush'ya G [Cyrillic], 8.VII.1911, G. Sumakov" [Latin; hw Sumakov], "B. Poppius" [printed], "H. Sumakovi Popp." [hw Poppius], "H. aenescens J. Sahlb., Nordv. Sibir.Col. 50,29Z, J. Sahlb. det." [hw J. Sahlberg, last line printed], "Mus. Zool. H:fors [= Helsingfors = Helsinki], Spec. typ. No ?586 [first digit illegible], H. Sumakovi, B. Popp." [hw in part], "Hydroporus acutangulus Th., det. A. Zimmermann" [hw A. Zimmermann, last line printed], "Lectotypus, *Hydroporus sumakovi* Poppius, 1912, des. Fery 2011" [red, printed] (ZMUH). **Notes:** The lectotype lacks nine left and eight right antennomeres, as well as the last two left tarsomeres; the right hind leg is disarticulated.

We have recently found a male in the MNB which might be the second specimen which Poppius reports in his description. We are, however, not sure about this and refrain from treating it as paralectotype. The specimen is labelled: "Novaja Semlja, 8 VII 1911" [yellow, possibly hw Sumakov] and "Hydroporus Sumakovi Popp." [most probably hw J. Sahlberg], "Hydroporus acutangulus Thoms., P. Petrov det. 2008" [hw P. Petrov].

Both specimens are very similar, distinctly reticulate over the entire surface, and the shape of the median lobe agrees more or less with that of *H. polaris* and by no means with that of *H. acutangulus*. This observation in combination with the record of *H. polaris* from the Wrangel Island (Nilsson & Holmen 1995: 48, see below) strongly suggests a study of more material from northern Russia (European and Asian parts) is needed, including also the types of *Hydroporus pectoralis* J. Sahlberg, 1880 and *Hydroporus aenescens* J. Sahlberg, 1880, which so far are treated as junior synonyms of *H. acutangulus*.



**FIGURE 13.** Distribution of: *Hydroporus acutangulus* (circles), *Hydroporus polaris* (squares), *Hydroporus tuvaensis* (triangle), *Hydroporus tibetanus* (stars), and *Hydroporus sejilashan* sp. n. (encircled star); the circle with question mark refers to the type locality of *Hydroporus sumakovi* (see text). Red squares indicate capitals of countries/provinces or other important and well-known cities.



**FIGURE 14.** Distribution of (enlarged map): *Hydroporus tuvaensis* (triangle), *Hydroporus tibetanus* (stars), and *Hydroporus sejilashan* sp. n. (encircled star). Red squares indicate capitals of countries/provinces or other important and well-known cities.

## First verified record of *Hydroporus nigellus* Mannerheim, 1853 from China

*Hydroporus nigellus* Mannerheim, 1853 belongs to the *nigellus*-group of the genus and is distributed in large parts of Europe and Asia (see Nilsson 2011). It was recorded from "China (Mongolia)" by Feng (1932: 25) and from "Peiping" by Wu (1937: 209) (both under the name *Hydroporus obscuripes* (Motschulsky, 1860)). Nilsson (1995: 53) suspected that Feng did not mean the "Chinese part of Mongolia" (Nei Mongol, "Inner Mongolia"), but the territory of what today is named "Mongolia" ("Outer Mongolia"). In addition Nilsson (1995: 53) declared Wu's record as "doubtful". We have no new information about these records, but can report that we have studied correctly determined specimens with the following collecting data: 17.7.1974, China, SE Qinghai, Yushu county, Batang village [estimated to be 33.0N 97.0E; not Batang in Sichuan!], 4200 m (the specimens were incorrectly identified as *Hydroporus saghaliensis* Takizawa, 1933 by H. Zeng in her PhD thesis and have, thus, the respective determination labels) (46 exs); 12.07.1995, NW Sichuan, ca. 40 km SSE Sertar, road Luhuo–Sertar, ca. 31.9N 100.6E, altitude ca. 2800 m, Rejssek leg. (3 exs); 27.6.2005, SE Qinghai, 35 km WSW Jigzhi, ca. 33.22N 101.07E, altitude ca. 4400 m, Kaláb leg. (12 exs); all specimens in SYSU and CHF, further specimens in CPM and CJS. All three localities are situated in a relatively small area of about 400 km diameter; some altitude data seem to be "very roughly estimated".

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