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Taxonomic notes on *Herophydrus* SHARP, 1882 (Insecta: Coleoptera: Dytiscidae) and other Hydroporinae

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Abstract

Hygrotus gouini GUIGNOT, 1953, and *Herophydrus galileae* WEWALKA, 1984 are formally proposed as new junior subjective synonyms of *Herophydrus cleopatrae* (PEYRON, 1858). *Hydroporus kashmirensis* VAZIRANI, 1970 [= *Hygrotus vaziranii* NILSSON, 1999] is transferred to *Herophydrus* SHARP, 1882.

Key words: Insecta, Coleoptera, Dytiscidae, *Herophydrus*, *Hygrotus*, *Hydroporus*, lectotype, new synonymies, new combination, redescription.

Zusammenfassung

Es konnte nachgewiesen werden, dass sowohl *Hygrotus gouini* GUIGNOT, 1953 als auch *Herophydrus galileae* WEWALKA, 1984 jüngere subjektive Synonyme des *Herophydrus cleopatrae* (PEYRON, 1858) sind. *Hygrotus vaziranii* NILSSON, 1999 wird zur Gattung *Herophydrus* SHARP, 1882 transferiert.

Introduction

Among material collected in Turkey by S. Schödl (NMW) I found a *Herophydrus* SHARP, 1882, which at first I was not able to determine. Examination of the types of *Hydroporus cleopatrae* PEYRON, 1858, *Hygrotus gouini* GUIGNOT, 1953, and *Herophydrus galileae* WEWALKA, 1984 finally enabled the determination of the Turkish specimens and revealed interesting taxonomic facts.

At the same time I have examined two *Herophydrus* specimens which were "discovered" by M. Toledo amongst undetermined material from the NHML. Accidentally I found out that the data on the labels of these specimens were almost identical with those cited for *Hygrotus vaziranii* NILSSON, 1999, which enabled clarification of the identity of this species.

Material and acknowledgements

The following acronyms for collections from which I have studied material are used in the text:

AUB	American University of Beirut, Lebanon (Dr. K. Knio, Dr. A.S. Talhouk)
CHF	coll. Dr. H. Fery, Berlin, Germany; property of the NMW
CLH	coll. L. Hendrich, Berlin, Germany
MNHN	Muséum National d'Histoire Naturelle, Paris, France (Dr. H. Perrin)
MZS	Musée Zoologique, Strasbourg, France (Dr. J.-C. Delécolle, J. Matter)
NHML	Natural History Museum, London, Great Britain (S.J. Hine)
NMW	Naturhistorisches Museum Wien, Austria (Dr. M.A. Jäch)
TAU	Tel Aviv University, Department of Zoology, Israel (Dr. A. Freidberg, A. Friedman)

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Herophydrus cleopatrae (PEYRON, 1858)

Hydroporus Cleopatrae PEYRON, 1858: 397.

Hydroporus cleopatrae PEYRON: SHARP 1882: 790. - GUÉORGUIEV 1981: 407.

Coelambus Cleopatrae (PEYRON): MARSEUL 1882: 51.

Hygrotus Cleopatrae (PEYRON): ZIMMERMANN 1920: 75.

Hyphoporus cleopatrae (PEYRON): ZIMMERMANN 1930: 114.

Herophydrus cleopatrae (PEYRON): DIMENTMAN et al. 1992: 50.

Hygrotus Gouini GUIGNOT, 1953: 115 (**syn.n.**).

Hygrotus gouini GUIGNOT: GUÉORGUIEV 1981: 403.

Herophydrus galileae WEWALKA, 1984: 131. - WEWALKA 1986: 278, 281 (**syn.n.**).

Type material: *Hydroporus cleopatrae*: **Lectotype** (present designation): ♂, "Tarsous" [printed], "Lectotype / Hydroporus cleopatrae / Peyron, 1858 / des. H. Fery 2001" [red], "Herophydrus / cleopatrae (Peyron) / Fery det. 2001" (AUB). **Notes:** PEYRON (1858: 397) neither stated the number of specimens studied nor designated a holotype. According to the original description the existence of more than one specimen on which the taxon was based cannot be excluded undoubtedly. This is why I follow the recommendation 73F of the ICZN (1999) and "proceed as though syntypes may exist rather than assume a holotype". The purpose of the designation of the lectotype is therefore stability of nomenclature. **Type locality:** Southern Turkey, Mantaş, ca. 5 km S Tarsus, west of Adana, in İçel province; PEYRON (1858: 398) referred to this village as "Mantach". **Notes:** The lectotype lacks the claws of the right protarsus.

Hygrotus gouini: **Holotype** (♂): "Adana" [printed], male sex symbol, "Coll. ZURCHER" [printed], "Type" [red, printed], "Guignot det., 1953 / Hygrotus / Gouini Guignot / Type ♂" [hw Guignot in part], , "78", "Herophydrus / cleopatrae (Peyron) / Fery det. 2001" (MZS). **Allotype** (♀): "Adana" [hw?], female sex symbol, "Coll. ZURCHER" [printed], "Allotype" [red, printed], "Muséum Paris / 1960 / Coll. F. Guignot", "Herophydrus / cleopatrae (Peyron) / Fery det. 1999" (MNHN). **Type locality:** Southern Turkey, Adana.

Herophydrus galileae: **Holotype** (♂): "20.6.1955 / Hula / Israel / Coll. Fishelsohn L.", "Holotypus / Herophydrus / galileae n.sp. / Wewalka [19]83" [red], "Herophydrus / cleopatrae (Peyron) / Fery det. 2001" (TAU). **Type locality:** Northern Israel, Upper Galilee, Hula reserve. **Notes:** The holotype lacks the last two articles of both antennae.

Additional material: 4 ♂♂, 4 ♀♀, "TR MUĞLA 21.V.1991, Köyceğiz-Muğla, leg. Schödl (49)" (NMW, CHF). 1 ♀, "18.-23.7.1985, Alanya - Cap Anamur road, freshwater swamp near Demirtas, Hendrich leg." (CLH).

Redescription: At first I want to emphasise that already SHARP (1882: 790) and later ZIMMERMANN (1930: 114) – though without having been able to study the type of *Hydroporus cleopatrae* – already assumed the species not to be a *Hydroporus*, but instead more closely related to *Herophydrus musicus* (KLUG, 1834). Below I more or less follow the description of the male holotype of *Herophydrus galileae* by WEWALKA (1984: 131), particular features of females are given separately.

Habitus oval, only slightly elongate, ventral surface strongly convex, upper surface less vaulted. Sides of pronotum almost straight, body outline with a slight discontinuity between pronotum and elytra. Head reddish, pronotum yellow-reddish with anterior and

posterior margin narrowly darkened. Elytra dark brown with yellow-reddish spots (see WEWALKA 1984: 134, Fig. 3a). Head coarsely and densely punctate, microreticulated to a small extent behind anterior margin, otherwise shiny between punctures, not reticulate; punctures very small on vertex. Clypeus with anterior marginal rim interrupted in the middle which is a characteristic feature of the genus *Herophydrus*. Punctuation on pronotal disc as on clypeus, also lacking reticulation; punctuation denser near sides and anterior and posterior margins; lateral beading narrow. Punctures on elytra not denser than on disc of pronotum or clypeus, but coarser and more deeply impressed; distance between punctures smaller than their diameter; puncture lines indistinct, but perceptible. Elytra shiny, without reticulation between punctures. Sides of elytra – except near apex – provided with a distinct rim. In lateral view margin of elytra distinctly ascending to humeral angle.

Major part of ventral surface blackish brown; head, prosternum, epipleura, metacoxal process, parts of metacoxal plates near the process, centre of metasternum, hind margins of third to fifth sternite, and last visible abdominal segment more reddish. Legs and antennae yellow-reddish, last articles of antennae slightly darkened apically. Venter in large extent strongly punctate, smooth between punctures; small areas beside centre of metasternum and near posterior margin of metacoxal plates microreticulated. Prosternal apophysis broadened, lancet like, but tip rounded; with a longitudinal keel, with small transverse carinae at sides, setation not recognisable. Epipleura strongly punctate, with an oblique carina near the shoulders. As in other *Herophydrus* and genera of Hygrotrini *Herophydrus cleopatrae* has the inner face of elytra provided with a carina in posterior half near margin, and this carina has a distinct lobe before apex. This ligula (see SHARP 1882: 389) is evenly raised anteriorly and abruptly ending posteriorly.

Notes: The synonymy of *Herophydrus galileae* and *Herophydrus cleopatrae* was already assumed by "Wewalka in litt." (see DIMENTMAN et al. 1992: 66). However, it is here formally established for the first time.

The types of all three taxa correspond more or less in size, habitus, and coloration. The holotype of *Herophydrus galileae*, however, has the posterior angles of the pronotum less rounded. In addition it is slightly teneral and thus has the median lobe not as strongly sclerotised. This will be the reason for the ventrally slightly more curved median lobe in lateral view. All types correspond also with the specimens from Muğla; in these, however, the paler spots on the surface are somewhat lighter, which most probably is due to the age of the specimens.

♂♂: Median lobe symmetric as in other *Herophydrus*; in dorsal view strongly pointed (see WEWALKA 1984: 134, Fig. 3b). Fore and mid tarsi slightly extended, protarsal claws dissimilar, inner claw shorter, more curved and thicker.

♀♀: Upper surface matt due to strong microreticulation; ventral surface microreticulated also, but less strongly and thus more shiny. Fore and mid tarsi not extended, protarsal claws equal and simple.

Measurements: TL: 4.2 - 4.4 mm, MW: 2.4 - 2.5 mm, TL/MW: 1.74 - 1.83. The specimens from Muğla are slightly larger than the other specimens.

Distribution: Southern and south-western Turkey, Israel. In Israel this species is obviously extinct nowadays (see DIMENTMAN et al. 1992: 101).

RÉGIMBART (1893: 363) presents a record of "*Hygrotus Cleopatrae*" from Syria: "Un exemplaire unique de Aïn-el-Musaïeh ... extrêmement voisin de *H. inaequalis* FAB. ...". In the MNHN I have found one specimen with the following labels: "Aïn el Musaieh, bassin du Lac de Houleh, Syrie", "Cleopatrae Peyron" [both hw Régimbart], "Muséum Paris, coll. Maurice Régimbart, 1908" [printed]. The specimen no doubt has proved to be a *Hygrotus inaequalis* (FABRICIUS, 1776).

Notes on biology: L. Hendrich (Berlin) has kindly communicated some details about the locality near Demirtas: The swamp extends over several acres and is covered with *Typhetum latifoliae* G. LANG, 1973. At the collecting site the water had a depth of 5 - 15 cm and a temperature of more than 30°C; there were dense growths of algae. *Herophydrus cleopatrae* was found together with hundreds of *Laccophilus poecilus* KLUG and *Hydrovatus cuspidatus* (KUNZE), and a few *Cybister tripunctatus lateralis* (FABRICIUS).

Herophydrus vaziranii (NILSSON, 1999) comb.n.

Hydroporus kashmirensis VAZIRANI, 1970: 117 [not *Hydroporus kashmirensis* RÉGIMBART, 1899: 195 (= *Nebrioporus kashmirensis*)]. - VAZIRANI 1980: 49.

Coelambus kashmirensis (VAZIRANI): BRANCUCCI 1981: 181.

Hygrotus vaziranii NILSSON, 1999: 19 (replacement name).

Type locality: "Kashmir".

Types (not studied): According to VAZIRANI (1970: 119) the female holotype and two female paratypes have labels with the following data: "India: Kashmir stn. 23, 1954 (S.L. Hora)" and are deposited in the (Z.S.I.) [= Zoological Survey of India, Calcutta].

Material studied: 2 ♀♀, "Kashmir Valley / Sta. 68 / Shalboog [or Shalborg] / 19.VII.1954 / S.L. Hora" [printed], "Com. Inst. Ent. / Coll. No. 13917" [printed] (NHML).

Notes: The original description of *Hydroporus kashmirensis* by VAZIRANI (1970: 118) is quite confusing. He compares his specimens with *Hydroporus discretus* FAIRMAIRE & BRISOUT, 1859 and *Hydroporus memnonius* NICOLAI, 1822 and states for the elytra: "... punctation strong and dense; distinctly microreticulated giving the surface rather dull appearance ..."; for the pronotum he gives "... punctation strong and dense, almost regular, separated by less than its own diameter ...". *Hydroporus memnonius* usually has a rather shiny surface – except the matt female morphs "var. *castaneus* AUBÉ, 1838" and "var. *insularis* SHARP, 1882", which, however, are not mentioned by VAZIRANI (1970). Furthermore *Hydroporus memnonius* – and in particular the matt morphs – have a punctation which on no account can be called "strong and dense". The species is described by VAZIRANI (1970: 118) as being "... black, tinged with ferruginous ...". BRANCUCCI (1981: 181), however, provides for one of the paratypes: "... uniformly reddish brown, it seems, however, that the anterior margin, the posterior margin and the suture of the elytra must have been much darker than the rest of the body." (personal translation). According to VAZIRANI (1970: 119) the elytra are "... almost parallel in anterior half and little rounded in posterior half." On the other hand he writes: "... form broader ..." than in *Hydroporus memnonius* and "... the form being more oval ..." than in *Hydroporus discretus*.

In his description of one female paratype BRANCUCCI (1981: 181) states that "... the paratype studied is in a bad state ...". He emphasises the existence of an epipleural carina at

the shoulders and thus concludes the species belongs to *Coelambus* THOMSON, 1860. In addition BRANCUCCI (1981: 182) groups the species with those *Coelambus* which have the lateral margin of the elytra only weakly ascending towards the humeral angle. He assumes, however, that the species seems to be somewhat deviating from all other known *Coelambus* and finds the elytra strongly punctate and microreticulated "what is pointing to a matt female". Matt morphs of *Coelambus* (this genus is now included in *Hygrotus*), however, always have a punctuation which is very fine and much less coarse than that of the respective males. Obviously BRANCUCCI (1981) had overlooked the rim on the anterior margin of the head which is typical for *Herophydrus*, but lacking in those Palaearctic *Hygrotus* which formerly have been treated as *Coelambus*.

Redescription: Habitus oval, ventral surface strongly vaulted, upper surface less so. In dorsal view sides of pronotum almost straight, near anterior angles weakly curved. Margins of pronotum and elytra with a more or less continuous outline, posterior angles of pronotum, however, distinctly rounded and thus outline of body here with a discontinuity. Surface dark reddish brown with diffusely limited slightly paler areas on anterior part of head and vertex, sides and disk of pronotum, base of elytra, a longitudinal area behind the shoulder, another one parallel to the suture, and one parallel to the elytra's margin in posterior half. Some very indistinct paler areas on posterior half of elytra. Anterior margin of head provided with an unpunctured rim of a lighter brown, thus contrasting with the darker and punctate area of clypeus behind. This rim raised near eyes, in the middle, however, not raised. Punctuation on clypeus less dense than on pronotum, becoming denser posteriorly, smaller and sparse on the paler vertex. Space between punctures not reticulate, shiny. Surface of pronotum and elytra provided with more or less evenly and densely distributed coarse punctures, separated by approximately their diameter. Punctures lines not perceptible. Space between punctures on elytra and pronotum strongly microreticulated, weakly shiny on elytra, on pronotum, however, a little more smooth and shiny. Sides of pronotum and elytra – except near apex – provided with a distinct rim. Margin of elytra moderately ascending to humeral angle in lateral view.

Major parts of ventral surface dark reddish brown, mouthparts, epipleura and legs paler; femora of mid and hind legs, however, darker. Second abdominal segment with four paler spots. Antennae and palpi yellowish, last two articles of antennae weakly darkened apically. Abdomen and large parts of venter strongly microreticulated and provided with punctures which are almost as coarse as on elytra, but less dense. Metacoxal process, metacoxal plates beside the process and centre of metasternum not microreticulated, shiny and punctures rather sparse. Prosternal apophysis broadened, lancet like, but tip broadly rounded; with a longitudinal keel, with small transversal carinae at the sides, setation not recognisable. Epipleura punctate, with an oblique carina near shoulders. Ligula on inner face of elytra evenly raised anteriorly and abruptly ending posteriorly. Fore and mid tibiae rather broad, external margin of mid tibiae distinctly rounded, thus maximum width before apex.

♂♂: So far unknown.

Measurements: VAZIRANI (1970: 118) gives a total length of 3.5 - 3.6 mm and a maximum width of 2.0 mm. The two females studied are 3.7 - 3.8 mm and 2.10 - 2.15 mm respectively.

Distribution: Kashmir.

Notes: The status of *Herophydrus vaziranii* still must be regarded as preliminary until further material – in particular males – will become available. I have also compared this species with specimens of *Hyphoporus bengalensis* SEVERIN, 1890 – the smallest *Hyphoporus* of the Indian subcontinent – but found it different in respect of shape of ligula and of clypeal beading, punctuation of upper and ventral surface, coloration and body shape. For a discussion of the rather problematic characteristics separating *Herophydrus* and *Hyphoporus* SHARP, 1882 the reader is referred to GUIGNOT (1950: 149) and VAZIRANI (1969: 203).

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