

New and little known species of *Hydroglyphus* (Coleoptera: Dytiscidae) from Arabia and adjacent areas

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Abstract. *Hydroglyphus sinuspersicus* sp. nov. is described from the United Arab Emirates, Oman and Iran. It is very similar to *H. major* (Sharp, 1882). *Hydroglyphus gujaratensis* (Vazirani, 1973) known previously only from Gujarat (India) is redescribed, based on recently collected material from Rajasthan (India), Iran and Oman. The first national records are given for *Hydroglyphus major* from Libya and for *H. infirmus* (Boheman, 1848) from Oman and Yemen.

Keywords. Dytiscidae, *Hydroglyphus*, description, new species, new records, Oriental Region, Palearctic Region, India, Iran, Libya, Oman, United Arab Emirates, Yemen.

Introduction

The genus *Hydroglyphus* Motschulsky, 1853 of the tribe Bidessini includes 87 species from the Old World (NILSSON 2001). Most species occur in the tropics of Africa, Asia and Australia. The genus is well characterised by the absence of transverse cervical line, three-segmented parameres, and well-developed sutural line of elytra (BISTRÖM 1988). BISTRÖM (1986) published a review of the African species, including also species from the Arabian Peninsula. Subsequently, WEWALKA (2004) described an additional species from Socotra Island, Yemen. The Oriental fauna remains unrevised except the Indian species that were treated by VAZIRANI (1969).

During our studies of the fauna of predaceous diving beetles of the Arabian Peninsula and adjacent areas, we have found a number of specimens of two peculiar species of *Hydroglyphus*, which we could not identify. One of them represents a new species, and we describe it below, while literature search revealed that the second species fits completely the description of

H. gujaratensis Vazirani, 1973, described originally from the Indian state of Gujarat. As the species was not recorded after VAZIRANI (1973, 1977), we redescribe it here and add new records from southern Iran and Oman, although we were not able to see the type material, deposited in the Vazirani collection (status unknown; most probably deposited in the Zoological Survey of India, Kolkata). Finally, we add some new faunistic records of *Hydroglyphus* from Libya, Oman and Yemen.

Material and methods

In descriptions, we mostly adopted the style used in BISTRÖM (1986). The terminology used to denote the orientation of the genitalia follows MILLER & NILSSON (2003). Exact label data are cited for the type material. A forward slash (/) separates different lines and a double slash (//) different labels of data. Additional remarks are found in square brackets.

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

BMNH	NATURAL HISTORY MUSEUM [FORMER BRITISH MUSEUM], LONDON, GREAT BRITAIN (CHRISTINE TAYLOR);
GWCW	Günther Wewalka collection, Wien, Austria;
HFCB	Hans Fery collection, Berlin, Germany (property of NHMW);
NHMB	Naturhistorisches Museum, Basel, Switzerland (Michel Brancucci);
NHMW	Naturhistorisches Museum, Wien, Austria (Manfred A. Jäch);
NMPC	Národní muzeum, Praha, Czech Republic (Jiří Hájek).

Taxonomy

Hydroglyphus sinuspersicus sp. nov.

(Figs. 1, 3–6)

Bidessus major SHARP, 1882: 354 (partim; Persia).

Guignotus major: GUIGNOT (1959): 274 (partim; Perse).

Hydroglyphus major: BISTRÖM (1986): 36 (partim; Persia).

Type locality. United Arab Emirates, Ras Al Khaiman Emirate, Al Ghail env., Wadi Fara, 25°25'06"N 56°04'50"E, 266 m.

Type material. HOLOTYPE: ♂ (NMPC), 'U.A.E. RAS AL KHAIMAN / Wadi Fara, env Al Ghail / N 25°25'06"E 55°[sic!]04'50" / 266 m a. s. l., 17.III.2007 / J. Batelka & H. Pinda leg. [printed]'. PARATYPES: 9 ♂♂ (nos. 1–9) 11 ♀♀ (nos. 10–20), same label data as holotype (BMNH, GWCW, NHMB, NMPC); 1 ♂ (no. 21) 1 ♀ (no. 22), 'U.A.E. 27.xi.-22.xii.2005 / WADI MAIDAQ / 25.18N 56.07E (light trap) / A. van Harten leg. ([loc. no.] 5821) [printed]' (NMPC); 1 ♀ (no. 23), 'U.A.E. 27.iv.-4.v.2006 / WADI MAIDAQ / 25.18N 56.07E (light trap) / A. van Harten leg. ([loc. no.] 4801) [printed]' (NHMB); 2 ♂♂ (nos. 24–25) 4 ♀♀ (nos. 26–29), 'U.A.E. 28.xi. 2006 / WADI MAIDAQ / 25.18N 56.07E (pool) / J.-L. Gattoliat leg. ([loc. no.] 5753) [printed]' (NHMB, NMPC); 1 ♂ (no. 30), 'U.A.E. 4-11.iv.2006 / near MAHAFAZ / 25.09N 55.48E (light trap) / A. van Harten leg. ([loc. no.] 8701) [printed]' (NMPC); 1 ♀ (no. 31), 'U.A.E. 24.-30.v.2006 / Sharjah x Khor Kalba / 24.59N 56.09E (light trap) / A. van Harten leg. ([loc. no.] 6965) [printed]' (NMPC); 1 ♂ (no. 32), 'U.A.E. 30.xi.2006 / WADI HATTA / J.-L. Gattoliat leg. ([loc. no.] 5773) [printed]' (NMPC); 1 ♂ (no. 33) 1 ♀ (no. 34), 'OMAN: Al Hamra / NW Niswar / 15. 10. 2007 / leg. H. Sattmann & R. Illek / Al Houty Höhle [= cave] / 23°04'N / 57°18' O / Hauptsee [= main lake] [printed]' (NHMW).

Additional material studied. IRAN: 1 ♂, 'Persia' [paralectotype of *Bidessus major* Sharp, 1882] (BMNH).

BUSHEHR: 8 ♂♂ 8 ♀♀, 17 km NW Bandar-e Gonaveh, Chahak, 29°39'N, 50°27'E, 13.-14.x.1998, P. Chvojka leg. (GWCW, NMPC).

Description. Body shape oblong oval. Pronotum trapezoidal, broadest basally. Sides of pronotum almost straight, anteriorly slightly curved inwards. Pronotum distinctly narrower than elytra; angle between pronotum and elytra distinct.

Measurements. Body length 2.9–3.3 mm, width 1.4–1.6 mm.

Colouration. Body colouring testaceous to ochraceous; head darkened broadly around eyes, pronotum with broad blackish transverse band basally and thin blackish transverse band along anterior margin, elytra with extensive dark pattern (Fig. 1). Ventral surface blackish; head and prothorax ventrally paler, testaceous. Pronotum and elytra covered with recumbent setae.

Surface sculpture. Head finely microsculptured; punctuation fine, rather sparse, posteriorly lacking behind eyes; anterior margin of head rounded, medially slightly straightened; frontolateral depressions shallow. Pronotum finely microsculptured, with fine, almost regularly distributed punctures, with recumbent setae; striae fairly strongly impressed. Elytra shiny, microsculpture very fine, partly somewhat indistinct; coarsely and fairly densely punctate, with recumbent setae; basal striae well developed, longer than striae on pronotum; sutural line distinct from close to base to apex. Epipleura finely punctate. Ventral surface with fine, sparse, irregularly distributed punctures, interstices shiny; microsculpture almost lacking on thorax and abdominal ventrite I; microsculpture on abdominal ventrites II–V composed of distinctly transverse meshes. Metacoxal lines almost straight, anteriorly slightly divergent.

Male. Pro- and mesotarsi slightly broadened. Median lobe in ventral view rather broad, slightly constricted in two thirds of its length; apex broadly pointed (Fig. 3). Median lobe in lateral view apically triangularly broadened with almost straight apical margin and acute, nearly rectangular ventro-apical angle (Fig. 4). Parameres (lateral lobes) three-segmented, all segments of similar length. Apical segment on ventral side with distinct hook and with crenulation along the dorsal margin (Fig. 6).

Female. Similar to male in habitus. Pro- and mesotarsi narrow.

Variability. The specimens from Iran agree well with typical specimens from the Arabian Peninsula in the habitus and especially in the extensive dark colouration on elytra. However, the median lobe is apically slightly rounded and its ventro-apical angle is rather obtuse in lateral view (Fig. 5), which can be interpreted as characters intermediate between *H. sinuspersicus* sp. nov. and *H. major* (Sharp, 1882). As we are not able to resolve whether this is intraspecific variability or a different taxon, we did not designate specimens from Iran as paratypes.

Differential diagnosis. The new species is without any doubt closely related to *H. major* from North Africa and south-western Arabian Peninsula. Most specimens can be immediately recognized by a more extensive colouration of the elytra but the only reliably differentiation is provided by the male genitalia: *H. sinuspersicus* sp. nov. differs by the median lobe having a triangular apical enlargement with almost straight apical margin and acute ventro-apical angle in lateral view (cf. BISTRÖM 1986: Fig. 43e).

Etymology. The new species is named after ‘Sinus Persicus’ (= Persian Gulf), which refers to its known area of distribution. The noun is used in apposition.

Collection circumstances. At the type locality, the new species was collected in residual pools in wadi (Fig. 12) (J. Batelka, pers. comm.). Additional specimens from the United Arab Emirates were collected in pools in wadis and at light. Two specimens from Oman were collected at the bank of a large lake in stalactitic cave (H. Sattman, pers. comm.), while the

series from south-western Iran was collected individually in small wells with brackish water close to the sea shore (P. Chvojka, pers. comm.).

Distribution. So far known only from several localities in the area of Persian Gulf with one locality in south-western Iran, two localities in the United Arab Emirates, and one locality in Oman (Fig. 14).

Hydroglyphus gujaratensis (Vazirani, 1973)

(Figs. 2, 7–10)

Guignotus gujaratensis: VAZIRANI (1973): 297 (original description); VAZIRANI (1977a): 33 (catalogue); VAZIRANI (1977b): 55 (new records; Gujarat).

Hydroglyphus gujaratensis: BISTRÖM (1988): 13 (new combination); NILSSON (2001): 123 (catalogue).

Type locality. 'India: Gujarat, Jamnagar'.

Material examined. **INDIA: RAJASTHAN:** 15 ♂♂ 17 ♀♀, Mandawa [ca. 28°03'N, 75°08'E], 1.x.1997, P. Pucholt leg. (GWCW, NMPC); 4 ♂♂ 1 ♀, NW of Dungarpur, 23°52'N 73°41'E, ca 250 m a.s.l., along river, 1.-2.vii.2006, Z. Kejval leg. (NMPC). **IRAN: HORMOZGAN:** 2 ♀♀, 2 km W Abkuhi, 25°30'N, 58°56'E, sea shore, 13.-14.iv.2000, J. Hájek & M. Mikát leg. (NMPC). **OMAN:** 3 ♀♀, 40 km E Badiya, Wadi Bani Kalil [Khalid], puddle near road, 12.ii.1998, G. Wewalka leg. (GWCW); 1 ♂, 30 km W Sur, river, 20.ii.1998, G. Wewalka leg. (GWCW); 1 ♂, 40 km NW Sur, Wadi Tiwi, 20.ii.1998, G. Wewalka leg. (GWCW).

Redescription. Habitus oblong oval. Pronotum broadest at basal third, very slightly cordiform. Sides of pronotum rounded. Angle between pronotum and elytra distinct.

Measurements: Length 2.5–2.9 mm, width 1.1–1.3 mm.

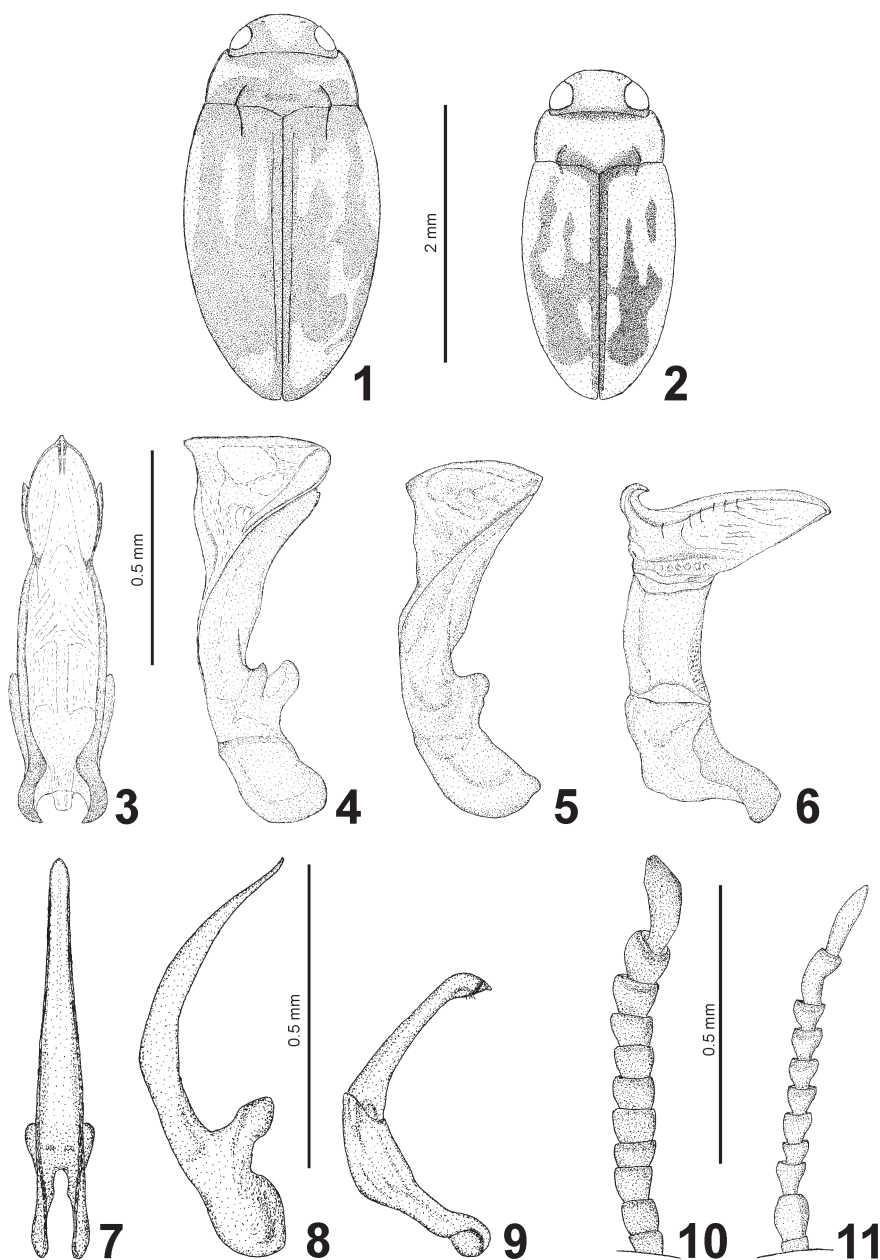
Colour. Body colouring testaceous to ochraceous; head posteriorly to eyes, pronotum basally between striae, and elytra basally between striae, along suture and in the apex darkened; elytra on the disc with variable dark markings as depicted in Fig. 2.

Surface sculpture. Head finely microsculptured; punctuation fine, rather sparse, posteriorly lacking behind eyes; anterior margin of head rounded, medially slightly straightened; frontolateral depressions shallow. Pronotum finely microsculptured with fine, almost regularly distributed punctures and recumbent setae; striae fairly strongly impressed. Elytra shiny, microsculpture sporadic and very indistinct; finely and fairly densely punctate, with recumbent setae; basal striae preserved as rather short and deep impressions; sutural line distinct from close to base to apex. Epipleura finely punctured. Ventral surface with fine, sparse, irregularly distributed punctures; shiny, microsculpture almost lacking. Metacoxal lines almost straight, anteriorly slightly divergent.

Male. Pro- and mesotarsi slightly broadened. Median lobe in ventral view slender, attenuating regularly to apex (Fig. 7). In lateral view, median lobe broad in basal two thirds, then sinuous, attenuating to very thin, long apex (Fig. 8). Parameres seemingly with only two segments (Fig. 9).

Female. Similar to male in habitus. Antennomeres 3–10 moniliform, distinctly wider than longer (Fig. 10). Pro- and mesotarsi narrow. Microsculpture on elytra more distinct than in male.

Comparative notes. *Hydroglyphus gujaratensis* is very similar to *H. flammulatus* (Sharp, 1882), and both species were collected together in Rajasthan. Nevertheless, *H. flammulatus* is slightly smaller (2.1–2.5 mm), pronotal striae do not continue on the elytra, elytral mar-



Figs. 1–11. 1, 3–6 – *Hydroglyphus sinuspersicus* sp. nov.: 1 – habitus; 3 – median lobe in ventral view; 4 – median lobe in lateral view (paratype, Oman); 5 same (Iran); 6 – right paramere in dorso-medial view. 2, 7–10 – *H. gujaratensis* (Vazirani, 1973): 2 – habitus; 7 – median lobe in ventral view; 8 – median lobe in lateral view; 9 – paramere; 10 – female antenna. 11 – *H. flammulatus* (Sharp, 1882), female antenna.



Fig. 12. Jan Batelka collecting *Hydroglyphus sinuspersicus* sp. nov. at the type locality in Wadi Fara (U.A.E.). Photo H. Pinda.



Fig. 13. Habitat of *Hydroglyphus gujaratensis* at the locality 'Dungarpur' (India, Rajasthan), shallow artificial pools near the river. Photo Z. Kejval.

kings are usually more extensive, and the male genitalia are differently shaped (cf. VAZIRANI 1969: Fig. 15a). Both species have moniliform antennae in females but antennomere 10 in *H. gujaratensis* is as broad as long and distinctly trapezoidal, whereas in *H. flammulatus* it is prolonged and C-shaped (Fig. 11).

Collection circumstances. Specimens from Mandawa were collected at light (P. Pucholt, pers. comm.), while specimens from Dungarpur were collected individually in shallow pools with clay bottom near the river (Fig. 13) (Z. Kejval, pers. comm.). Two females from Iran were collected in shallow brackish pool near the sea shore. Specimens from Oman were found partly in puddles in wadis and in pools with rich vegetation near rivers.

Distribution. *Hydroglyphus gujaratensis* seems to be continually distributed in lowland areas along the Arabian Sea from the eastern Arabian Peninsula to north-western India (Fig. 15). It is here recorded for the first time from Oman, Iran, and Rajasthan (India). Its presence in Pakistan is unconfirmed but likely.

New records

Hydroglyphus infirmus (Boheman, 1848)

Material examined. OMAN: 7 spec., Dhofar region, Rakhyut [ca. 16°44'N, 54°20'E], 0–50 m a.s.l., 13.–14.i.1997, S. Jákl leg. (NMPC). **YEMEN:** 6 spec., Al Bayda gov., At Taghiq vill. env., NW Al Bayda by road, 14°08'26"N, 45°25'53"E, 1968 m, 4.–5.xi.2007, A. Reiter leg. (NMPC).

Distribution. Widely distributed African species occurring in most areas of southern and eastern Africa and reaching the Arabian Peninsula in the north (cf. BISTRÖM 1986). In Arabia probably common but possibly confused with *H. confusus* (Klug, 1834). **First record from Oman and Yemen.**

Hydroglyphus major (Sharp, 1882)

Material examined. LIBYA: 1 ♀, Yafran/Ghadamis prov., 10 km W Ar Rahibat, Nana Tala, 31°47'09"N, 11°47'07.9"E, 605 m, 27.v.2002, A. Reiter leg. (NMPC); 3 spec., Akakus [Mts.], [ca. 25°00'N, 10°30'E], Oued Teskuinat, 28.ii.[20]05, H. Bussler leg. (HFCB). **OMAN:** 1 ♀, Dhofar region, Rakhyut [ca. 16°44'N, 54°20'E], 0–50 m a.s.l., 13.–14.i.1997, S. Jákl leg. (NMPC); 1 ♂ 1 ♀, 30 km W Salalah, Wadis near Al Mughsayd, pools and lagoons, 27.ii.1998, G. Wewalka leg. (GWCW).

Distribution. The species occurs in the Saharan Africa from Niger, Algeria and Chad to the countries along the Red Sea (Egypt, Sudan, Eritrea, Djibouti, Somalia, Saudi Arabia and Yemen), reaching Israel in the north and southern Oman in the east (Fig. 14) (cf. BISTRÖM 1986). **First records from Libya.**

Discussion

The territory of the Arabian Peninsula represents an interesting area from a zoogeographical point of view. The first hypothesis about the diverse origin of the water beetle fauna of Arabia was proposed by BALFOUR-BROWNE (1951) and corroborated by BRANCUCCI (1979, 1980, 1981, 1985) and ROCCHI (1985). Our study further reiterates that the Arabian Peninsula

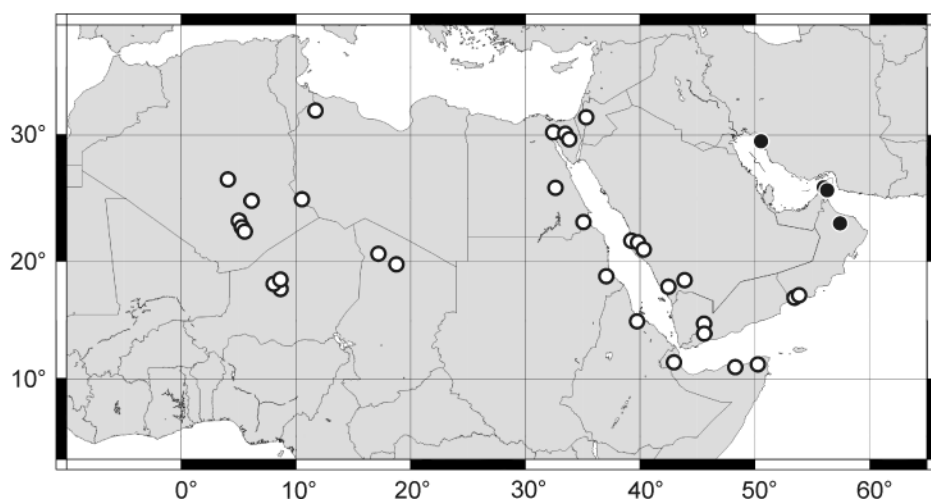


Fig. 14. Distribution of *Hydroglyphus major* (Sharp, 1882) (circles), and *H. sinuspersicus* sp. nov. (dots).

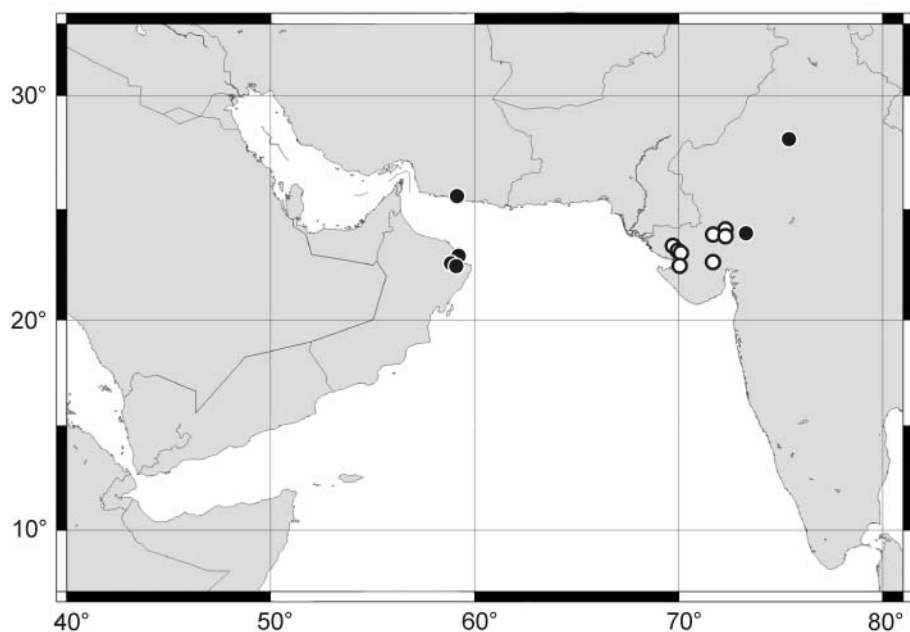


Fig. 15. Distribution of *Hydroglyphus gujaratensis* Vazirani, 1973 (circles – literature records from Vazirani (1973, 1977); dots – examined material).

is a typical transition area between the neighbouring major zoogeographical regions. The continuous occurrence of subtropical species from North Africa to the Arabian Peninsula is exemplified by *H. major*. Fauna of Afrotropical origin is characterised by the occurrence of *H. infirmus*, while an example of an Oriental species reaching the peninsula is provided by *H. gujaratensis*.

Hydroglyphus gujaratensis is probably an eurytopic species occurring in various types of stagnant water (including brackish habitats) in lowland semi-deserts along the Arabian Sea. Given that no African species have females with moniliform antennae (BISTRÖM 1986) but this character occurs in several Oriental species, we assume Oriental origin of *H. gujaratensis*. Its distribution in south-eastern Iran and north-eastern Arabian Peninsula is in good accordance with previous hypotheses on spreading of Oriental fauna along the Arabian Sea to the coastal areas of southern Pakistan and Iran, and north-eastern Arabian Peninsula (cf. HÁJEK 2006).

Furthermore, the centre of water beetle endemism around the Persian Gulf is indicated by several species, namely *H. sinuspersicus* sp. nov. and additional new taxa from the genus *Hydroglyphus* (U.A.E. and Iran) and *Copelatus* Erichson, 1832 (U.A.E.) (J. Hájek & M. Brancucci, in prep.) and a new species of *Georissus* Latreille, 1809 (Hydrophiloidea: Georissidae) (FIKÁČEK & TRÁVNÍČEK 2009). Although the relationships of those species are poorly understood, all of them seem to be closely related to Afrotropical species. Therefore, we assume their vicariant speciation and isolation from a common African ancestor caused by the formation of deserts in the Arabian Peninsula.

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