HETeroptera POLONIAE
ACTA FAUNISTICA 17

Heteroptera Poloniae – Acta Faunistica
vol. 17: 151–156. Opole, 15 XI 2023
ISSN 2083-201X
http://doi.org/10.5281/zenodo.10107303

Hydrometra maindroni (Hemiptera: Heteroptera: Hydrometridae): first record from Iran and notes on its variability

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Abstract. *Hydrometra maindroni* Hungerford & Evans, 1934 (Hemiptera: Heteroptera: Hydrometridae: Hydrometrinae), previously known only from the Arabian Peninsula (Oman and the United Arab Emirates), is recorded for the first time from Iran (Hormozgan). The distribution of the species is reviewed.

Key words: Hemiptera, Heteroptera, Hydrometridae, faunistics, Iran, Palaearctic Region.

Introduction

The marsh treaders or water measurers (Hydrometridae) represent a very distinctive family of the predatory semiaquatic true bugs (Gerromorpha). Many members of the family have a slim and extremely elongate body, antennae and legs, and all of them have eyes far removed from the anterior margin of the pronotum. *Hydrometra* Latreille, 1797 species are often found on or around stagnant or slowly running waters and are generally associated with marginal vegetation, but may also occur on damp rock walls. Some tropical representatives are terrestrial (Schuh & Weirauch 2020; Polhemus 2022).

The family includes three extant subfamilies, 12 genera and at least 133 described species, of which more than 112 belong to the nominotypical genus *Hydrometra* (Polhemus & Polhemus 2010; Polhemus & Ferreira 2018; Martínez et al. 2019; Schuh & Weirauch 2020; Polhemus 2022). Most of the marsh treader taxa are distributed in the tropics. The Palaearctic Region harbours only 18 species, all belonging to the genus *Hydrometra*. In the Western Palaearctic the genus is represented by two species widely distributed especially in its nothern areas, *H. stagnorum* (Linnaeus, 1758) and *H. gracilenta* Horváth, 1899, and four species with restricted, non-overlapping distribution ranges in its southern parts: *H. aegyptia aegyptia* Hungerford & Evans, 1934 (Egypt, extending to Sudan), *H. maindroni* Hungerford & Evans, 1934 (Oman, the United Arab Emirates), *H. monoceros* Linnavuori, 1986 (Iraq, Saudi Arabia), and *H. scotti* Brown, 1951 (Yemen) (Andersen 1995; Aukema et al. 2013; Aukema 2023). From the large and biogeographically diverse territory of Iran only the widely distributed *H. stagnorum* and *H. gracilenta* were recorded so far, none of them from the two southernmost provinces – Hormozgan and Sistan and Baluchestan (Ghahari et al. 2013). Moreover, the record of *H. gracilenta* from Markazi province provided in the Ph.D. thesis by Vafei (2005) (see Ghahari et al. 2013) is also in need of confirmation. In the neighbouring Pakistan, two more species are recorded: the widely distributed Oriental *H. albolineata* (Scott, 1874) and the endemic *H. yaqubi* Ghauri, 1965 (Ghauri 1965; Heiss et al. 2022). In this paper, we provide the first records of *Hydrometra maindroni* from Iran.

Material and methods

Photographs were made using a Canon MP-E 65 mm macrolens attached to a Canon EOS 550D camera. Final images were stacked from multiple layers using the Helicon Focus 5.1 Pro software. The wing morph terminology follows Andersen (1982), Polhemus & Polhemus (1987), and Polhemus & Lansbury (1997).

The detailed data on locality, habitat, and geographical coordinates were excerpted from the expedition itinerary by Hoberlandt (1981). The geographical coordinates of localities in the United Arab Emirates follow van Harten (2008), for Wadi Hayl T. van Harten (pers. comm.). The distribution map was created using SimpleMappr (Shorthouse 2010). Current names of the plant species follow *'Plants of the World Online'* (Anonymus 2023).

The specimens examined are deposited in the following museum collections:

- ACPI – Attilio Carapezza collection, Palermo, Italy;
- NHMW – Naturhistorisches Museum in Wien, Vienna, Austria;
- NMPC – National Museum of the Czech Republic, Prague, Czech Republic;
- RLRF – Rauno E. Linnavuori collection, Raisio, Finland.

Results

***Hydrometra maindroni* Hungerford & Evans, 1934** (Figs 1–9)

Material examined. **IRAN: Hormozgan:** Teleng (26°53′N 57°16′E, Loc. No. 205), 40 km SE Minab, 21.v.1973, 1♀ (macropterous), Exp. Mus. Nat. Praha lgt., P. Kment det. (NMPC); Isin (27°19′N 56°17′E), south slopes of Kuhha-ye Genu (27°25′N, 56°09′E), 45 km NW of Bandar Abbas, 11.–15.iv.1973 (Loc. No. 198), 2♂♂ 2♀♀ (brachypterous), Exp. Mus. Nat. Praha lgt., P. Kment det. (NMPC); same locality, 26.v.1973 (Loc. No. 213), 9♂♂ 10♀♀ (brachypterous), Exp. Mus. Nat. Praha lgt., P. Kment det. (8♂♂ 9♀♀ 1 larva in NMPC, 1♂ 1♀ in NHMW). **OMAN: Ad Dakhiliyah Governorate:** Ghul env., Jebel Akhdar (23°09′N 57°12′E), 760 m a.s.l., pool in wadi, 20.x.1995, 1♂ 4♀♀ (1♂ 2♀♀ macropterous, 2♀♀ brachypterous), M. D. Gallagher & M. W. Balkenhol lgt., A. Carapezza det. (ACPI). **UNITED ARAB EMIRATES:** Wadi Ghayl [= Wadi Hayl; 24.52°N 56.11°E], 1♀ (brachypterous), 29.xi.2006, hand collected, J.-L. Gattoliat lgt., R. Linnavuori det. (RLRF → NMPC) (Linnavuori et al. 2011); Wadi Safad, 130 m a.s.l., 6.iii.2007, 1♀ (brachypterous), hand collected, A. Carapezza lgt. & det. (ACPI) (specimen erroneously reported as ♂ in Linnavuori et al. 2011).

Figures 1–3. Habitus of *Hydrometra maindroni* Hungerford & Evans, 1934: 1 – macropterous female, Iran: Minab (body length 11.0 mm, length of hemelytra 4.1 mm); 2 – brachypterous male, Iran: Isin (body length 10.2 mm, length of hemelytra 1.3 mm); 3 – brachypterous female, Iran: Isin (body length 11.7 mm, length of hemelytra 1.8 mm).

Identification. *Hydrometra maindroni* shares the triangular, conate clypeus with most of the West Palaearctic species, except *H. stagnorum* which has clypeus subquadrate with truncate frontal margin. Distinguishing *H. maindroni* from the remaining species require examination of the posterior abdominal segments and/or male and female genitalia (see Hungerford & Evans 1934; Brown 1951; Ghauri 1965; Linnavuori 1986).

Variation. Hungerford & Evans (1934) described the species based on one male and one female, both brachypterous, body length 11.1 mm and 11.7 mm, respectively. Linnavuori et al. (2011) reported one macropterous and two micropterous females (one erroneously indicated as male) from the United Arab Emirates, but did not provide details on the macropterous form. In the material available in our study we found one male and three females with well developed hemelytra and hind wings, reaching in male to hind margin of tergite VI, in females middle of tergite V, three quarters of tergite V, and middle of tergite VI (Figs. 1, 7–8). Due to the developed hind wings we classify here this form as macropterous. The remaining specimens has narrow, stripe-like rudiments of wings reaching base of abdominal tergite III, fitting the criterion of brachypterous morph sensu Andersen (1982).

We found the following range of body length: ♂♂: (macropterous) 11.5 mm, (brachypterous) 10.2–10.8 mm;

♀♀: (macropterous) 11.0–12.8 mm, (brachypterous) 10.6–13.0 mm. For detailed measurements of body length see Table 1.

Hungerford & Evans (1934) provided the following description of the colouration: 'General color of the body is a dark brown; on the male there is a narrow median longitudinal white stripe on the pronotum; a faint white stripe extends along the sides of the body from the anterior margin of the pronotum to the posterior margin of the sixth abdominal segment; the ventral parts of the body with frosted appearance; the female is similarly colored except that the ventral part of the body is lighter brown in color and is not frosted'. In our specimens the colouration is pale to medium brown, in males the abdomen is usually darker than the forebody, being medium to darker brown (Fig. 2), in females the forebody and abdomen are concolorous (Fig. 3). The narrow median longitudinal stripe is usually present in both sexes, though it is faded to missing in some specimens; also the faint whitish stripe on body sides is also often obsolete. The puncturation of pronotum is variable, sometimes forming two distinct submedian longitudinal rows, sometimes the punctures are scattered, distinct or very shallow.

Figures 4–8. Morphology of *Hydrometra maindroni* Hungerford & Evans, 1934 from Iran, Isin: 4 – head, dorsal view (male); 5–6 – male terminalia (5 – dorsal view, 6 – lateral view); 7–8 – female terminalia (7 – dorsal view, 8 – lateral view).

Biology. Nothing is known about biology of the species except the general description of its habitats in the UAE where it was collected in pools in wadis; the specimen from Wadi Safad was collected among the vegetation bordering a small pool (Linnavuori et al. 2011). The new record from Oman comes from a pool in a wadi.

The description of both Iranian localities was provided by Hoberlandt (1981): (1) Teleng: Semi-desert, gravel dry river-bed with water pools; lower terraces with *Nerium indicum* subsp. *kotschyi* [= *N. oleander*], *Prosopis spicigera* [= *P. cineraria*], *Tamarix mascatensis*, *Salvadora persica*, *Acorellus distachius* [= *Cyperus laevigatus* subsp. *distachyos*], *Aeluropus lagopoides*, *Launaea cassiniana* [= *L. mucronata* subsp. *cassiniana*]; close to the water on the sandy-clayish substrate with *Typha australis* [= *T. domingensis*] and *Juncus rigidus*. Collected from the vegetation, on the bank of the river, in water, under stones and in soil. (2) Isin: Deep canyons and steep clayish slopes in the south area of Genu mountain, with numerous water pools in the bottom of main canyon (5 km NW of oasis Isin) with sparse vegetation of *Adiantum capillus-veneris*, *Capparis spinosa* var. *mucronifolia*, *Nerium indicum* subsp. *kotschyi* [= *N. oleander*], *Fimbristylis miliacea* [= *F. quinquangularis* subsp. *quinquangularis*], *F. diphylla* [= *F. dichotoma* subsp. *dichotoma*], *Eleocharis capitata* [= *E. geniculata*], *Acorellus distachyus* [= *Cyperus laevigatus* subsp. *distachyos*], *Abutilon muticum* [= *A. pannosum* subsp. *pannosum*], *Abutilon hirtum*, *Grewia populifolia* [= *G. tenax*], and *Oldenhamia retrorsa* [= *Kohautia retrorsa*] (Hoberlandt 1981).

Distribution (Fig. 9). **ASIA:** Iran: Hormozgan (**new record**), Oman (Hungerford & Evans 1934; this paper), United Arab Emirates (Linnavuori et al. 2011).

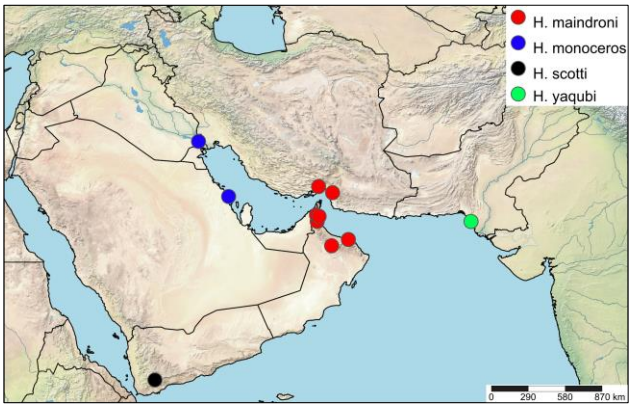

Figure 9. Distribution map of *Hydrometra maindroni* Hungerford & Evans, 1934 (red circles), *H. monoceros* Linnavuori, 1986 (blue circles), *H. scotti* Brown, 1951 (black circle) and *H. yaqubi* Ghauri, 1965 (green circle). Based on Hungerford & Evans (1934), Brown (1951), Ghauri (1965), Linnavuori (1986), Linnavuori et al. (2011) and new records.

Comments. The species was described based on specimens from Oman, Mascat [= Muscat, 23°35.3′N 58°23.0′E] by Hungerford & Evans (1934). Since the original description the species has not been recorded again until Linnavuori et al. (2011) who recorded three additional specimens from three localities in the United Arab Emirates: Wadi Hayl (= Al-Hayl, 24°52′N 56°11′E), Wadi Maidaq (25°19′N 56°08′E, 410 m a.s.l.) and Wadi Safad (25°13′N 56°19′E, 130 m a.s.l.). Our present records extend the distribution of *H. maindroni* to Iran (Hormozgan) and confirm the presence of the species in Oman, where it has not been recorded since its original description. According to present data the species is confined to the mountain ranges surrounding the Strait of Hormuz and Gulf of Oman. Such a distribution pattern is unusual among water bugs, but is also seen in certain aquatic beetles, e.g. *Hydroglyphus sinuspersicus* Hájek & Wewalka, 2009 and *H. hormuzensis* Hájek & Brancucci, 2011 (Dytiscidae) or *Ochthebius monseti* Jäch & Delgado, 2010 (Hydraenidae) (Hájek & Wewalka 2009; Hájek & Brancucci 2011; Ribera et al. 2019).

Acknowledgements

We thank Tony van Harten (Almada, Portugal) for explanation on the UAE localities, and Gavril Marius Berchi (West University of Timişoara, Timişoara, Romania) and an anonymous referee for valuable comments to the manuscript. This work received support from the Ministry of the Culture of the Czech Republic (DKRVO 2019–2023/5.I.e, National Museum, 00023272).

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Table 1. Body length and length of macropterous hemelytra (wl) of available specimens of *Hydrometra maindroni* Hungerford & Evans, 1934. The body length of the type specimens from Muscat comes from Hungerford & Evans (1934) and specimen from Wadi Maidaq from Linnavuori et al. (2011).

Locality	Male (macropterous)	Female (macropterous)	Male (brachypterous)	Female (brachypterous)
Iran: Isin	–	–	10.2–10.8 mm [median 10.5 mm] (n = 10)	10.6–12.4 mm [median 11.4 mm] (n = 11)
Iran: Minab	–	11.0 mm [wl 4.1 mm] (n = 1)	–	–
Oman: Jebel Akhdar	11.5 mm [wl 4.7 mm] (n = 1)	12.4–12.8 mm [wl 4.9–5.2 mm] (n = 2)	–	12.5–13.0 mm (n = 2)
Oman: Muscat	–	–	11.1 mm (holotype, n = 1)	11.7 mm (allotype, n = 1)
UAE: Wadi Hayl	–	–	–	12.3 mm (n = 1)
UAE: Wadi Maidaq	–	12.5 mm (n = 1)	–	–
UAE: Wadi Safad	–	–	–	12.3 mm (n = 1)

Received: 24 July 2023
Accepted: 31 October 2023