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Article

Redescription of *Hygrobates quanaticola* (Acari: Hygrobatidae) based on new materials from Iran

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Abstract

Hygrobates quanaticola is redescribed from new materials collected in Iran. Additionally, the description of the deutonymph is provided. This is the first report of this species from lotic waters.

Key words: Hydrachnidia, lotic and lentic waters; Prostigmata; *Rivobates*; water mites.

Introduction

Species richness of family Hygrobatidae Koch is highest in water mite fauna of Iran (Pešić and Saboori 2007; Pešić *et al*. 2014). From this family, 37 species have been reported so far, which belong to three genera: *Atractides* Koch (26 species), *Hygrobates* Koch (10 species), and *Iranobates* Pešić, Smit and Asadi (one species) (Pešić and Saboori 2007; Pešić *et al*. 2014). The subgenus *Rivobates* Thor is characterized by the numerous pairs (more than three) of acetabula (Cook 1974). The only representative of this subgenus in water mite fauna of Iran is *Hygrobates quanticola* that is a little documented species and reported only from Iran and Turkey (Esen *et al*. 2013). In this work, we redescribe the species from new materials collected from a pond in the Gandoman Wetland and also a roaring river in the Cheshme Ali village in Chaharmahal and Bakhtiari Province of Iran.

The description of its deutonymph is also provided for the first time. Previously, *H. quanaticola* had been collected and reported only from lentic water. In this study, a lotic habitat is reported for this species for the first time.

Material and methods

During field work, water mites were collected by hand netting, sorted on the spot from the living material, conserved in Koenike's fluid and dissected as described elsewhere (e.g. Gerecke *et al.* 2007). The material has been collected in the Gandoman Wetland and from a river near the Cheshme Ali village. National wetland Gandoman, 31° 50' 21" N, 51° 05' 00" E, 15.07.2013 (4 ♂, 3 ♀, 3 DN), and river near village

fountain Ali 1♀. For recording the coordinates, a Garmin GPS device was used. In all sites, *H. quanaticola* occurs in lentic water but in the Cheshme Ali habit *H. quanaticola* collected in lotic water. Observations and measurements were made with a differential interference microscope (Amscope T490-A and B), and illustrations were prepared using a camera Amscope. All specimens were used for morphometric measurements, which were performed using an Amscope software in unit micrometer.

Results

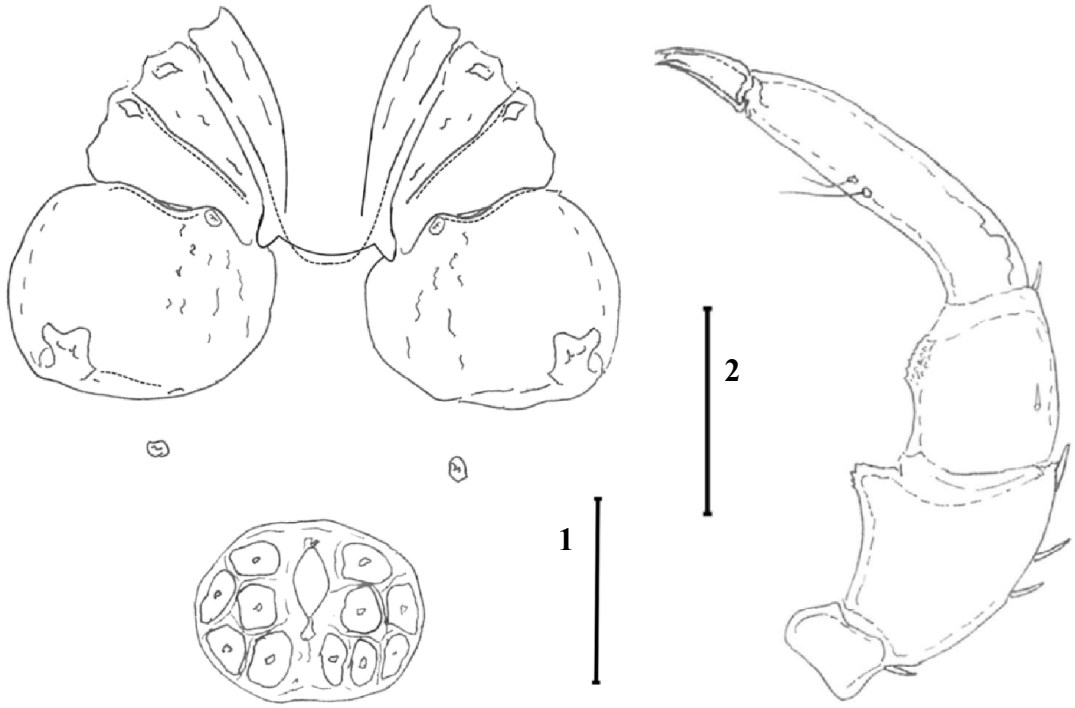
Family Hygrobatidae Koch

Genus *Hygrobates* Koch
Subgenus *Rivobates* Thor

Hygrobates quanaticola Schwoerbel and Sepasgozarian, 1976 (Figs. 1–11)

Male (Figs. 1–4)

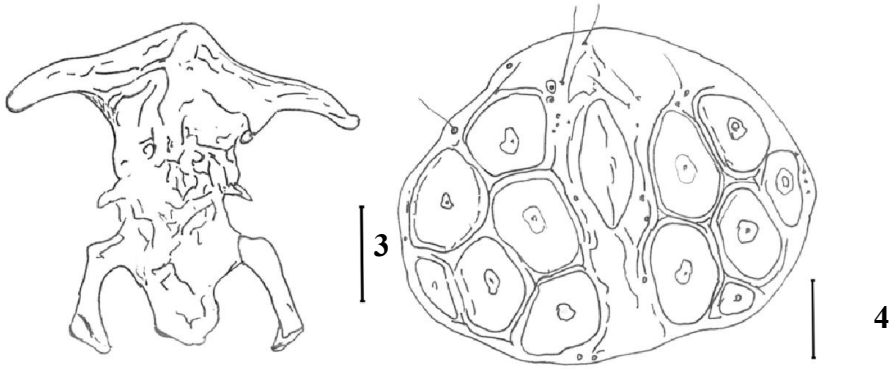
Idiosoma oviod, body length (including coxa) 728–859, width 620–737; coxal field length 358–398, width 557–591; median length Cx-I + gnathosoma 240–274; Palp (Fig. 2): Total length 415–459; dl: P-1 32–35; P-2 102–112; P-3 81–93; P-4 152–167; P-5 45–51; chelicera length 327–365; claw length 112–120; genital field (Fig. 3) width 221–237; genital field length 154–188; genital opening 128–142. Legs: dL of I-L-4-6 137–160, 144–168, 151–175; dL of IV-L-4-6 191–248, 206–265, 203–268; genital field (Fig. 4) length 153–166.



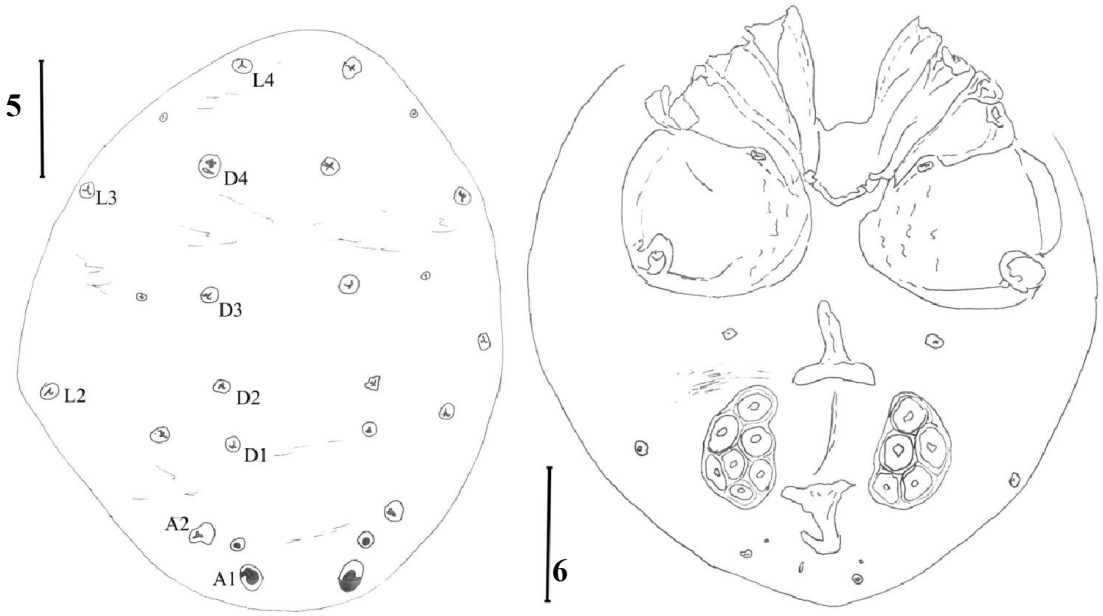
Figures 1–2. *Hygrobates quanaticola* Schwoerbel and Sepasgozarian, 1976 (male) - 1. Coxal and genital field; 2. Palp, lateral view. Scale bars = 0.1 mm.

Female (Figs. 5–9)

Idiosoma oviod, body length (including coxa) 776–1027; width 713–857. Coxal field length 381–455, width 587–710, median length Cx-I + gnathosoma 266–278; Palp (Fig. 7): Total length 415–459; dl: P-1 34–43; P-2 121–133; P-3 85–97; P-4 171–180; P-5 50–53; chelicera length 375–394; claw length 120–124; genital field (Fig. 8) width 324–382; genital field length 159–163; genital opening 189–197; antenniform seta (Fig. 9) length 60. Legs: dL of I-L-4-6 151–163, 154–177, 160–166; dL of IV-L-4-6 200–284, 240–315, 222–273; Egg 300.



Figures 3–4. *Hygrobates quanaticola* Schwoerbel and Sepasgozarian, 1976 (male) - 3. Aedeagus; 4. Genital field. Scale bars = 0.05 mm.



Figures 5–6. *Hygrobates quanaticola* Schwoerbel and Sepasgozarian, 1976 (female) - 5. Idiosoma, dorsal view; 6. Idiosoma, ventral view. Scale bars = 0.1 mm.

Deutonymph (Figs. 10–11)

Idiosoma ovoid, body length (including coxa) 533–547. Width 434–462; coxal field length 251–266, width 360–394, median length Cx-I + gnathosoma 148–168; Palp (Fig. 10): Total length 415–459; dl: P-1 22–29; P-2 64–71; P-3 49–55; P-4 100–107; P-5 29–

33; chelicera length 224–229; claw length 74–79; genital field (Fig. 11) width 147–168; genital field length 64–71; genital opening 49–60; Legs: dL of I–L-4-6 91–97, 99–120, 87–130; dL of IV-L-4-6 153–167, 167–190, 167–180.

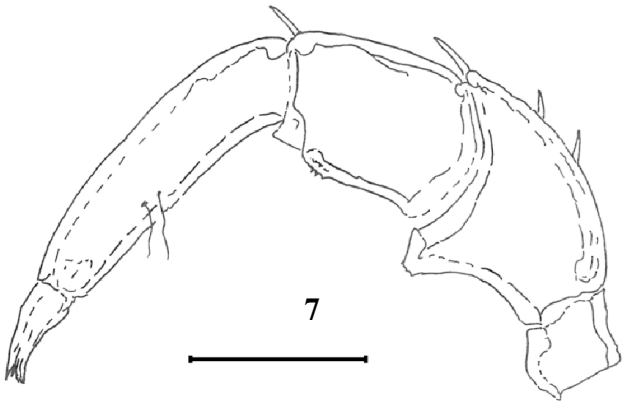
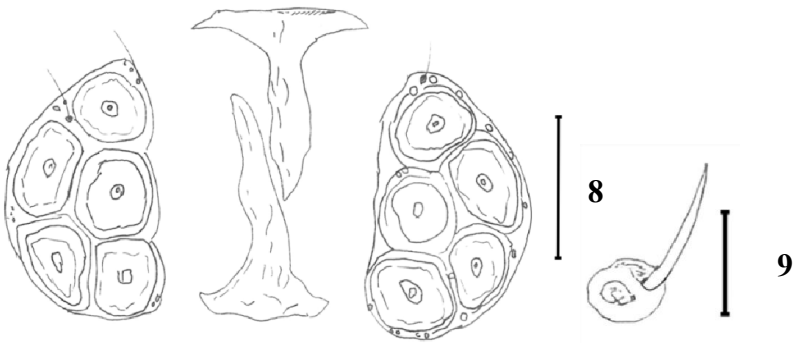


Figure 7. *Hygrobates quanaticola* Schwoerbel and Sepasgozarian, 1976 (female) - Palp, lateral view. Scale bar = 0.1 mm.



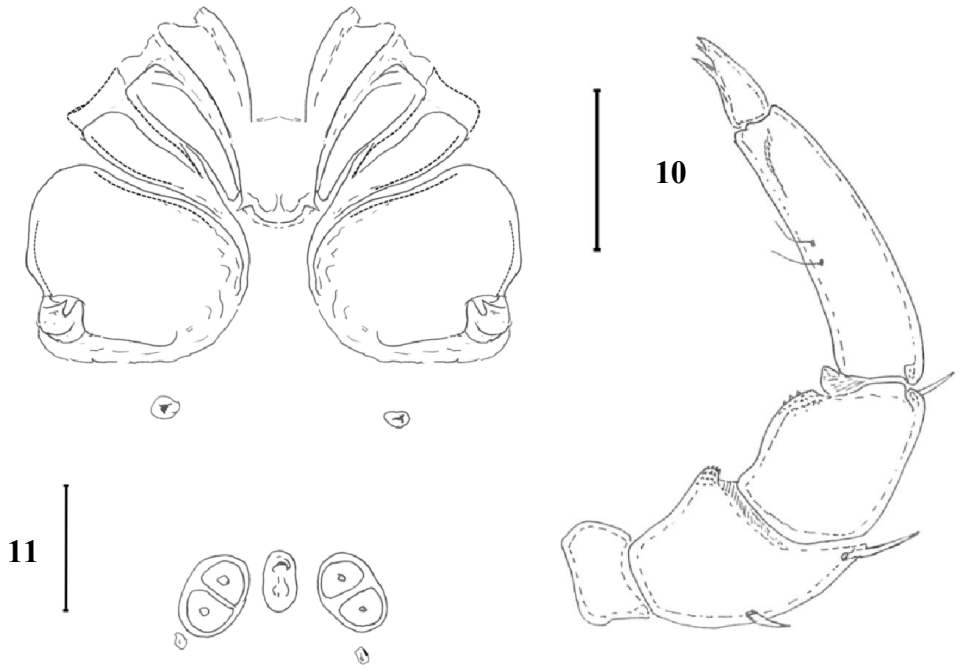
Figures 8-9. *Hygrobates quanaticola* Schwoerbel and Sepasgozarian, 1976 (female) - 8. Genital field; 9. Antenniform seta. Scale bar (Fig. 8) = 0.1 mm, Scale bar (Fig. 9) = 0.05 mm.

Discussion

Schwoerbel and Sepasgozarian (1976) originally described *Hygrobates quanticola* from Iran. They collected this species from a small channel of a quanat near Rezayeh. This species is also reported from Turkey (Erman *et al*. 2010), although Pešić (2015) wrote that the records from Turkey should be verified by the additional sampling and morphological analysis.

This is the second report of this species from Iran. In this study, the species was collected from both lotic and lentic habitats in Chahrmahal and Bakhtiyari Province as follows: 1. from a pond in the Gandoman Wetland. The area of this pond is 980 hectares and its height is 2219 m a.s.l. Water resources of pond, besides the rain and snow are springs (springs around the pond such as Gol Kuchak, Gol Bozorg, Moradan and Nasir Abad) and also Aqbolagh river. The maximum depth of the pond is two meters. Pond vegetation cover is mainly consisted of marginal and moisture friend kinds such as willow trees, grass chicken, sedge, broad, lily, blue buttercup, water plantain, swamp palm and pond weed; 2. From a roaring river in the Cheshme Ali village located near

the township of Lordegan. This river has a fast flow and stems from Sabzkuh and Kalar Mountain in the core of Chaharmahal and Bakhtiari Province and eventually leads to the Sulegan pond in the eastern part of Province. This river is four meters deep in deepest part of it and it is covered with aquatic plants such as water buttercup and water plantain.



Figures 10–11. *Hygrobates quanaticola* Schwoerbel and Sepasgozarian, 1976 (Deutonymph) - 10. Palp, lateral view; 11. Coxal and genital field. Scale bars = 0.1 mm.

Different combination of acetabula numbers per genital fields was found between the populations of lotic and lentic habitat. In our lentic collection site (*i.e.* Gandoman) there were asymmetric combinations of acetabula numbers (right+left): (6+5), (5+7), (6+6), (7+5). But all of the populations of lentic habitat had symmetric combinations of acetabula numbers (5+5). Furthermore the dimensions of palp segments in this study were different from data taken from the original description.

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بازتوصیف گونهٔ *Hygrobates quanaticola* (Acari: Hygrobatidae) براساس نمونه‌های جدید از ایران

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چکیده

گونهٔ *Hygrobates quanaticola* بر اساس نمونه‌های جدید جمع‌آوری شده در ایران بازتوصیف می‌شود. افزون بر این، توصیف مرحلهٔ پورهٔ سن دوم آن نیز ارایه شده است. این مقاله نخستین گزارش این گونه از آب‌هایی با جریان تند (خروشان) است.

واژگان کلیدی: Hydrachnidia، پیش‌استیگمایان، کنه‌های آبزی، *Rivobates*، آب‌های راکد و خروشان.

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