

## Updating the *Hydraena* fauna of Iran, with descriptions of eight new species (Insecta: Coleoptera: Hydraenidae)

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### Abstract

The Iranian fauna of *Hydraena* Kugelann (Coleoptera: Hydraenidae) is updated. Eight species are described as new for science: *H. bakriensis*, *H. farsensis*, *H. feryi*, *H. hajeki*, *H. motzfeldi*, *H. nurabadensis*, *H. pesici*, and *H. proesei*. The latter also occurs in Azerbaijan. Male genitalia, gonocoxite and female tergite X of *H. parysatis* Janssens and *H. persica* Janssens are illustrated for the first time. New distribution data for twelve species are given. *Hydraena anatolica* Janssens, *H. grandis* Reitter, *H. khnזורiani* Janssens, and *H. tauricola* Jäch are recorded from Iran for the first time. *Hydraena grandis* is recorded from Azerbaijan for the first time. The *Hydraena scythica* species group is established.

### Zusammenfassung

Die Kenntnis der iranischen Arten der Gattung *Hydraena* Kugelann (Coleoptera: Hydraenidae) wird aktualisiert. Acht neue Arten werden beschrieben: *H. bakriensis*, *H. farsensis*, *H. feryi*, *H. hajeki*, *H. motzfeldi*, *H. nurabadensis*, *H. pesici* und *H. proesei*. Der Aedeagus, das Gonocoxit und das Tergit X des Weibchens von *H. parysatis* Janssens und *H. persica* Janssens werden erstmals abgebildet. Die Verbreitungsangaben von zwölf Arten werden ergänzt. *Hydraena anatolica* Janssens, *H. grandis* Reitter, *H. khnזורiani* Janssens und *H. tauricola* Jäch werden erstmals für den Iran gemeldet.

**Key words:** Coleoptera, Hydraenidae, *Hydraena*, taxonomy, distribution, Iran, Armenia, Azerbaijan.

### Introduction

Only eight species of *Hydraena* Kugelann were recorded from Iran so far (see JÄCH 1992, 2004, BILTON & Jäch 1998): *H. calcarifera* Janssens, *H. fontiscarsavii* Jäch, *H. hosseinieorum* Bilton & Jäch, *H. janeceki* Jäch (erroneously not listed for Iran by JÄCH 2004), *H. orientalis* Breit, *H. parysatis* Janssens, *H. persica* Janssens and *H. verstraeteni* Ferro.

Since 1996 several European taxonomists (e.g. H. Fery, D. Frenzel, V. Pešić, A. Pütz, S. Schödl, A. Skale, G.

Wewalka) have been searching for hydraenids in Iran. Their samples, most of which are stored in the NMW, include several undescribed and hitherto unrecorded species of *Hydraena*.

Together with some specimens collected by J. Hájek and various Iranian entomologists (H. Barani, S. Falamarzi, H. Nasserzadeh) they form the basis of the present update. In total, eight new species of *Hydraena* are described herein, and four species are recorded from Iran for the first time.

### Material, methods and acknowledgements

About 500 specimens of *Hydraena* from Iran were examined. A few specimens from neighbouring areas (Armenia, Azerbaijan) were studied as well. All specimens examined are deposited in the following institutions and private collections:

CFS	Coll. Frenzel, Sonneberg, Germany
CPE	Coll. Pütz, Eisenhüttenstadt, Germany
CSH	Coll. Skale, Hof, Germany
HMIM	Hayk Mirzayans Insect Museum, Iran (H. Nasserzadeh)
MNB	Museum für Naturkunde, Berlin, Germany (J. Frisch)
NME	Naturkundemuseum Erfurt, Germany (M. Hartmann)
NMPC	Národní muzeum, Praha, Czech Republic (J. Hájek)
NMW	Naturhistorisches Museum Wien, Austria (M.A. Jäch)
SMNS	Staatliches Museum für Naturkunde Stuttgart, Germany (W. Schawaller)
TMB	Természettudományi Múzeum, Budapest [Hungarian Natural History Museum] (O. Merkl, G. Szél)
ZMK	Jalal Afshar Zoological Museum, Department of Plant Protection, College of Agriculture, University of Tehran, Karaj, Iran (A. Saboori)

Two additional specimens of two new species are deposited in the NMW in alcohol for future DNA-analysis. They are not designated as paratypes.

We are grateful to all institutions and persons listed above for the loan of material, D. Frenzel (Sonneberg), V. Pešić (Podgorica), A. Pütz (Eisenhüttenstadt) and G. Wewalka (Wien) for providing additional specimens, and H. Fery (Berlin) and J. Hájek (Praha) for the identification of various Hydradephaga which were found associated with some of the new species described herein. We are obliged to Prof. A. Saboori, Mahdi Tork, UT-CAN (University College of Agriculture & Natural Resources, University of Tehran, Dept. of Plant Protection, Karaj, Iran) and S. Hesami (College of Agriculture, Islamic Azad University, Shiraz, Iran), for their invaluable support, especially during the first author's excursions in 2008 and 2010.

H. Nasserzadeh (HMIM) is thanked for her comments on the manuscript.

All line drawings were made using a drawing tube attached to a Jenalab/Carl Zeiss Jena.

P. Limbourg, V. Desmet and A. Drumont (Brussels) are thanked for searching for *Hydraena calcarifera* Janssens in the Institut royal des Sciences naturelles de Belgique, Bruxelles resp. in the Université libre de Bruxelles (ULB).

The habitus photographs were made by M. Brojer and B. Dvorak (NMW).

#### Check list of the Iranian species of *Hydraena*

1. *Hydraena anatolica* Janssens, 1963
2. *Hydraena bakriensis* sp. n.
3. *Hydraena calcarifera* Janssens, 1959
4. *Hydraena farsensis* sp. n.
5. *Hydraena feryi* sp. n.
6. *Hydraena fontiscarsavii* Jäch, 1988
7. *Hydraena grandis* Reitter, 1885
8. *Hydraena hajeki* sp. n.
9. *Hydraena hosseinieorum* Bilton & Jäch, 1998
10. *Hydraena janeceki* Jäch, 1987
11. *Hydraena khnzoriani* Janssens, 1968
12. *Hydraena motzfeldi* sp. n.
13. *Hydraena nurabadensis* sp. n.
14. *Hydraena orientalis* Breit, 1916
15. *Hydraena parysatis* Janssens, 1981
16. *Hydraena persica* Janssens, 1981

17. *Hydraena pesici* sp. n.
18. *Hydraena proesei* sp. n.
19. *Hydraena tauricola* Jäch, 1988
20. *Hydraena verstraeteni* Ferro, 1984

#### *Hydraena gracilis* species group (*Haenydra* clade)

##### *Hydraena* (s.str.) *anatolica* Janssens, 1963

*Hydraena anatolica* Janssens 1963: 146.

**Type locality:** Lake Abant, Bolu Prov., northern Turkey.

**Iranian material examined:** 1 ♂ (CPE): "IRAN, Prov. Mazandaran [IR08-23] Ramsar County, Elburz Mts., N-Slope, Eshkatechal, small stream, 36°50'53.0"N, 50°34'64.4"E, 1458m, 06.VI.2008, leg. A. Pütz"; 5 exs. (CSH): "N-Iran: Prov. Mazandaran, vic. Now Shahr, Kheiroud Kenar forest (river) 36°31'38"N, 51°38'46"E 880m, 2.V.2010 leg. A. Skale (43)".

**Differential diagnosis:** Habitus as in Plate 1 Fig. 1. This species is closely related with the European *Hydraena gracilis*. Mesal face of male mesotibia straight or slightly concave, denticulate in posterior half; mesal face of male metatibia more or less straight; elytral apices distinctly excised in female.

Aedeagus (see JÄCH 1995: Figs. 22–26).

**Distribution:** Northern and eastern Turkey, Armenia, Azerbaijan, northern Iran (Mazandaran) (first record).

##### *Hydraena* (s.str.) *fontiscarsavii* Jäch, 1988

*Hydraena fontiscarsavii* Jäch 1988: 769.

**Type locality:** Carstic spring, 20 km S Hakkari, Hakkari Prov., southeastern Turkey.

**Iranian material examined:** 2 exs. (NMW): East Azarbaijan Prov., Tabriz, 22.IX.2003, leg. A. Atamehr; 1 ex. (CPE): "IRAN, Prov. Mazandaran [IR08-23] Ramsar County, Elburz Mts., N-Slope, Eshkatechal, small stream, 36°50'53.0"N, 50°34'64.4"E, 1458m, 06.VI.2008, leg. A. Pütz"; 1 ♂ (NMW): Tehran Prov., Elburz Mt., 17 km N Karaj, 18.VIII.2003, leg. V. Pešić "IR49". Based on the specimens from Tabriz, JÄCH (2004) recorded this species for the first time from Iran.

**Differential diagnosis:** Habitus as in Plate 1 Fig. 2. Body length: 2.1–2.3 mm. Posterior half of mesal face of male mesotibia slightly convex and denticulate; mesal face of metatibia slightly convex in posterior 0.3–0.6.

Aedeagus (see JÄCH 1988a: Fig. 26).

**Distribution:** Eastern Turkey, Armenia, northern and northwestern Iran (East Azarbaijan, Mazandaran, Tehran).

***Hydraena (s.str.) hosseinieorum* Bilton & Jäch, 1998**  
*Hydraena hosseinieorum* Bilton & Jäch 1998: 343.

**Type locality:** Bozghan Spring, ca. 80 km NW Shiraz, ca. 2000 m a.s.l., Fars Prov., southwestern Iran.

**Differential diagnosis:** Habitus as in Plate 1 Fig. 3. Body length: 2.35–2.50 mm. Externally, this species is characterized by the strongly vaulted pronotal disc, by the distinct subbasal elytral impression, and by the widely explanate elytra (especially posteriorly). Mesal face of male mesotibia slightly dilated subapically.

Aedeagus (see BILTON & JÄCH 1998: Fig. 26).

**Distribution:** Southwestern Iran (Fars).

***Hydraena (s.str.) khnzoriani* Janssens, 1968**

*Hydraena khnzoriani* Janssens 1968: 114.

*Haenydra terraevastatae* Jäch 1988: 768.

**Type locality:** Kirovakan, Armenia.

**Iranian material examined:** 2 exs. (HMIM, NMW): “HAMEDAN, Eberu, 10 Km S Eberou [= Eberu City], 2500m. N34 39 19.8 E48 32 18.6, 22.7.2008 leg. Nasserzadeh&Seri”. Specimen deposited in HMIM with second label: “IRAN Hayk Mirzayans Insect Museum (HMIM)”.

**Differential diagnosis:** Habitus as in Plate 1 Fig. 4. Externally, this species is very similar to *Hydraena fontis-carsavii*. Posterior half of mesal face of male mesotibia slightly more convex. For safe distinction, genitalic structures should be examined.

Aedeagus (see JÄCH 1988a: Fig. 27).

**Distribution:** Eastern Turkey, Armenia, western Iran (Hamedan) (first record).

***Hydraena grandis* species group**

***Hydraena (s.str.) farsensis* sp. n.**

**Type locality:** Bamoo Nationalpark, 1800 m, NE Shiraz, Fars Prov., southwestern Iran.

**Type material:** Holotype ♂ (NMW): “IRAN: Fars, 18.9.1997 7km NE Shiraz Bamoo NP, 1800m leg. Schödl (17)”. **Paratypes:** 13 ♂♂, 20 ♀♀ (CSH, NMW): same locality data as holotype; 4 ♂♂, 5 ♀♀

(NMW): “IRAN: Fars, 26.4.1996 25km NE Shiraz Bamoo NP, Dar-e-bishe leg. Wewalka (16)”; 4 ♂♂, 3 ♀♀ (NMW): “IRAN: Fars Bamoo N.P. 8.1.2002 leg. H. Barani”; 9 ♂♂, 9 ♀♀ (HMIM: 2, NMW: 16): “IRAN: Fars Province 20 km Qir, Shaldan N 28°33' E 52°59', 1090m 12 Dec. 08 [= 2008] leg. Sh. Falamarzi”.

**Description:** Habitus as in Plate 2 Fig. 5. Body length: 2.00–2.55 mm. Reddish or yellowish brown, head dark brown, pronotum, except anterior and posterior margin brown, appendages reddish brown, tips of palpi usually darkened. Clypeus sparsely punctate, medially distinctly or superficially microreticulate, laterally densely microreticulate. Frons densely punctate, interstices medially more or less glabrous.

Pronotum transverse, subcordiform, lateral rim denticulate; anterior margin slightly concave; disc convex, densely punctate, interstices more or less distinctly microreticulate, oblique posterior admedian groove shallow or absent; sublateral groove distinct, densely microreticulate; lateral margin densely punctate and microreticulate. Elytra elongate, punctures small and rather densely arranged in 15 more or less regular lines, intervals and interstices usually glabrous, sometimes somewhat rugose; explanate margin moderately wide, anteriorly denticulate. Metaventral plaques long and slender. Border between pubescent and glabrous area of abdominal sternite VII distinctly bisinuous.

Legs sexually dimorphic.

Secondary sexual characters: Males (2.15–2.55 mm) on average larger than females (2.00–2.45 mm). Elytra of male more parallel-sided, apices distinctly wider. Metaventral plaques of male gradually narrowing toward base, slightly carinate in basal half, slightly directed laterad at very base; middle of metaventricle more deeply impressed in male. Femora stronger in male; male mesotibia thin, slightly and evenly curved, with a fringe of moderately long, subapical mesoventral setae and an inconspicuous ventral subapical swelling; mesal face of male metatibia (Fig. 1b) with a well developed acute tooth near midlength, and a row of bristles along mesal margin in apical half. Apical three abdominal segments of male enlarged.

Male terminal sternite and spiculum (Fig. 1e): Sternite distinctly asymmetrical, strongly excised apically, apices acute.

Aedeagus (Fig. 1a): Main piece strongly bi-angulate in ventral view, with remarkable, weakly sclerotized,

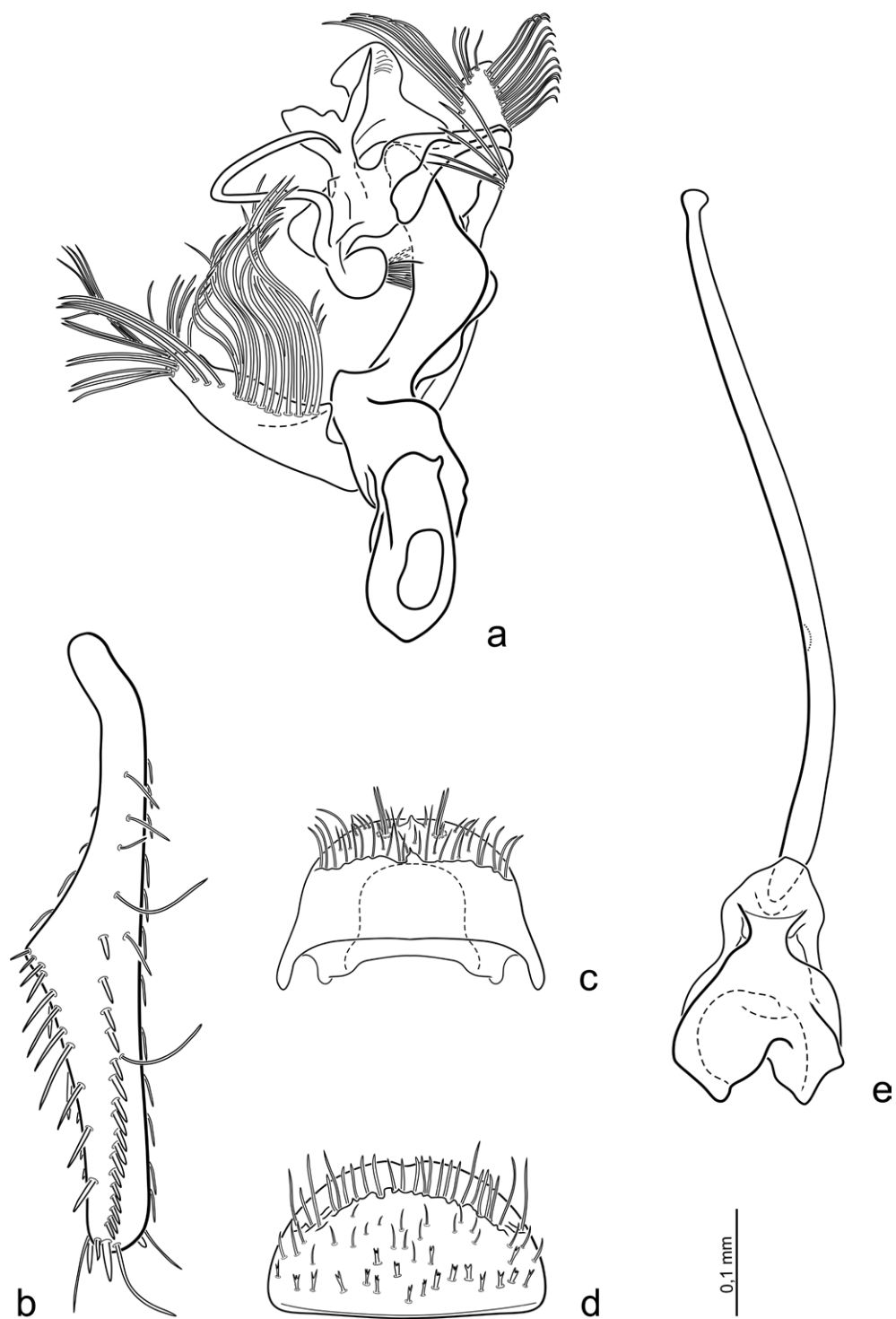


Fig. 1: *Hydraena farsensis*: a) aedeagus, ventral view; b) right metatibia of male; c) gonocoxite; d) female tergite X; e) male sternite X and spiculum.

hyaline extension near middle on right side; with a group of about 10 setae on left side proximal of distal lobe; phallobase asymmetrical. Distal lobe very complex with numerous variously sized, variously strongly sclerotized and variously shaped appendages, and a moderately long, strongly curved, distinctly sclerotized flagellum. Parameres inserted near phallobase; right paramere longer than main piece, slender, bisinuous in apical half, with several distinct expansions and fringes of long setae in apical 0.3; left paramere about half as long as main piece, subbasally angularly widened, with fringes of partly very long setae apically and ventrally. Gonocoxite (Fig. 1c): Transverse, basal apophyses long. Inner plate basally exposed, slightly projecting laterally; cavea basally open.

Female tergite X (Fig. 1d): Transverse; anterior margin slightly emarginate apically, with subapical fringe of moderately long trichoid setae and a few longer ones laterally; disc with trichoid setae in apical half and with squamose bifid setae in basal half.

**Differential diagnosis:** Externally, this species resembles *H. grandis* and *H. proesei* due to its acute metatibial tooth. *Hydraena grandis* differs, among many other characters, in the much larger body size, modified protibia, thicker and straight mesotibia. For *H. proesei* see below.

**Variability:** In some specimens, the apices of the palpi are very faintly darkened or not darkened at all. Paratypes from Qir are usually darker, often unicolored.

**Distribution:** Southwestern Iran (Fars).

**Etymology:** Named in reference to the type locality.

### *Hydraena (s.str.) grandis* Reitter, 1885

*Hydraena grandis* Reitter 1885: 360.

**Type locality:** Vólos, Thessalia, Greece.

**Iranian material examined:** 1 ♂ (CPE): "IRAN, Prov. Zanzjan [= Zanzjan] [IR08–31] Abbar County, 3 km north Gilvan spring, small stream, 36°49'08,8"N, 49°08'32,6"E, 529 m, 09.VI.2008, leg. A. Pütz".

**Differential diagnosis:** Habitus as in Plate 2 Fig. 6. *Hydraena grandis* is characterized by its enormous size (the single known Iranian male is 3.00 mm long). Terminal segment of maxillary palpi apically darkened. Protibia of male enlarged, mesal face flattened in apical half, with a group of subapical setae; male mesotibia

enlarged, more or less straight, subapically enlarged, mesal face densely covered with setae between apex and apical 0.35; male metatibia with a well developed acute tooth at midlength, with sparsely set bristles along apical emargination.

*Hydraena farsensis* and *H. proesei* share an acute metatibial tooth with *H. grandis*. However, due to its large size, *H. grandis* is easily distinguished from all other Iranian species of the genus.

Aedeagus (see JACH 1992: Fig. 46).

**Distribution:** Southeastern Europe, Armenia, Turkey, Azerbaijan (first record), northwestern Iran (Zanzjan) (first record).

### *Hydraena (s.str.) motzfeldi* sp. n.

**Type locality:** Small stream near Now Shahr, 500 m, 36°35'20"N, 51°34'05"E, Kheiroud Kenar forest, Mazandaran Prov., northern Iran.

**Type material:** **Holotype** ♂ (NMW): "N-Iran, Prov. Mazandaran N – Elburz, SW-Now Shahr 36°35'20"N, 51°34'05"E, 500m, 03.06.2008, leg.A.Skale (23)".

**Paratypes:** 15 ♂♂, 20 ♀♀ (CSH, NMW, ZMK): same locality data as holotype; 2 ♂♂, 4 ♀♀ (CSH): "N-Iran, Prov. Mazandaran, NW – Elburz, Ramsar, 36°53'21"N 50°34'43"E, 450m, 02.06.2008 leg.A.Skale, small stream (21)"; 1 ♀ (CSH): "N-Iran, Prov. Mazandaran, N – Elburz, Dohesar-Road, 550m 36°35'11"N, 50°47'67"E 01.06.2008, leg.A.Skale (17)"; 1 ♂ (CSH): "N-Iran, Prov. Mazandaran, N – Elburz, Dohesar-Road, River 36°40'00"N, 50°49'57"E, 460m 01.06.2008, leg.A.Skale (18)"; 2 ♂♂, 2 ♀♀ (CSH): "N-Iran, Prov. Mazandaran, N – Elburz, Abbasabad-Kalardasht [= Kelardasht] 36°34'66"N, 51°09'72"E, 1030m 05.06.2008, leg.A.Skale (25)"; 3 ♀♀ (CPE): "IRAN, Prov. Mazandaran [IR08 –20] Chalus County, Elburz Mts., N -Slope, 10 km SE Abbasabad, small stream, 36°38'95.9"N, 51°12'22.5"E, 149m, 04.VI.2008, leg. Nasserz adeh & Pütz"; 2 ♂♂, 3 ♀♀ (CFS): "N-Iran,Prov.Mazandaran N-Elburz,Now Shahr,sw, Primary Forrest [= Forest], 500m, 36.35.20N, 51.34.05E, 03.06.08[=2008], leg.D.Frenzel"; 1 ♂, 8 ♀♀ (CSH): "N-Iran, Prov. Mazandaran, N-Elburz, Kolyak, 36°28'38"N 51°39'88"E, 1628m 04.06.2008, leg.A.Skale (24)"; 1 ♂ (SMNS): "IRAN: Elburz-Geb., Masandaran [Mazandaran], 25 km südl. Amol westl. Seitental des Heraz

490–560 m, 29. Juni 1978 MARTENS & PIEPER leg.”, “*Hydraena* cf. *armata* KUW. Det. Jäch 1991”; 2 ♀♀ (CPE): “IRAN, Prov. Mazandaran [IR08–01A] Sari County, Mohammadabad, Elburz Mts. N-Slope, 2,2 km NE Bendela, 36°04'06.6"N, 53°09'57.8"E, 1533m, Fagus forest, 30.V.2008, leg. A. Pütz”.

**Description:** Habitus as in Plate 2 Fig. 7. Body length: male: 2.70–2.80 mm, female: 2.25–2.55 mm. Black, anterior and posterior margin of pronotum narrowly dark brown, elytral gutter dark brown, appendages reddish brown, palpi unicolored. Clypeus sparsely punctate, medially glabrous or superficially microreticulate between punctures, laterally densely microreticulate. Frons moderately densely punctate, medially more or less glabrous, laterally densely microreticulate.

Pronotum transverse, subcordiform, lateral rim denticulate; anterior margin slightly concave medially, slightly produced toward eyes; disc distinctly convex, moderately densely punctate, interstices glabrous or more or less distinctly microreticulate (meshes comparatively large), oblique posterior admedian groove shallow or absent; sublateral groove distinct, densely microreticulate; lateral margin distinctly punctate, more or less superficially reticulate.

Elytra elongate, punctures small, star-shaped, rather densely arranged in 15 more or less regular lines, intervals and interstices glabrous; explanate margin moderately wide, anteriorly and subapically weakly denticulate.

Metaventral plaques strongly sexually dimorphic. Border between pubescent and glabrous area of abdominal sternite VII distinctly bisinuous.

Legs sexually dimorphic.

Secondary sexual characters: Males distinctly larger than females (see above). Pronotal disc more distinctly vaulted in male. Elytra of male more elongate, more parallel-sided, apically distinctly wider, subtruncate. Metaventral plaques of male very thin, widely separated, very slightly curved; in female moderately wide, less widely separated, slightly or distinctly convergent anteriorly; metaventrite more deeply impressed in male. Legs, especially femora, stronger in male; mesal face of male mesotibia inconspicuously enlarged in apical 0.3, with a group of very long thin subbasal setae, and a fringe of moderately long, partly curved setae on antero-ventral margin at apical 0.3–0.4; male metatibia

(Fig. 2e) slightly curved near middle, with a distinct rounded subbasal extension on mesal face covered with long setae becoming gradually shorter toward posterior end of extension, mesal face more or less distinctly compressed in basal 0.1–0.5. Apical three abdominal segments of male enlarged.

Male terminal sternite and spiculum (Fig. 2f): Sternite slightly asymmetrical, distinctly excised apically, apices more or less rounded.

Aedeagus (Fig. 2a–d): Main piece short and stout, wide, quite similar to *H. armata* Reitter (see Jäch 1987: Fig. 1), in lateral view more parallel-sided, ventral margin with acute tooth (lateral view); apex on left side with five slanting or almost flat lying thick setae pointing dorsad, in ventral view with five long thin setae emerging from base of produced margin. Appendages of distal lobe wider, longest branch in ventral view with conspicuous submedian extension on right side.

Gonocoxite (Fig. 2g): Subquadrate, basal apophyses strongly projecting, base of inner plate slightly exposed, concave; cavea small, in apical position.

Female tergite X (Fig. 2h): Transverse, apical margin convex, distinctly excised medially; subapical fringe with rather short trichoid setae, laterally with some longer, curved setae; disc with variously sized, bi- and trifold squamose setae.

**Differential diagnosis:** This species is very similar to *Hydraena armata* from Georgia, and an undescribed species from Azerbaijan. Externally, *H. motzfeldi* differs from *H. armata* in the unicolored palpi and the distinctly slenderer male metatibia.

*Hydraena motzfeldi* differs significantly from the other Iranian members of the *H. grandis* group in the remarkable male metatibia.

**Ecology:** This species was collected in water soaked moss, in the wet splash zone slightly above the water line, and in the hygropetric zone of small streams. It was found together with *Hydraena janeceki*, *H. proesei*, *Ochthebius saboorii* Skale & Jäch (Hydraenidae), and *Hydroglyphus geminus* Fabricius (Dytiscidae).

**Distribution:** Northern Iran (Mazandaran).

**Etymology:** Named in honour of Prof. Dr. Gerd Müller-Motzfeld (Greifswald, Germany), well known specialist in Carabidae, who unexpectedly died 2009, during an expedition in Kyrgyzstan.

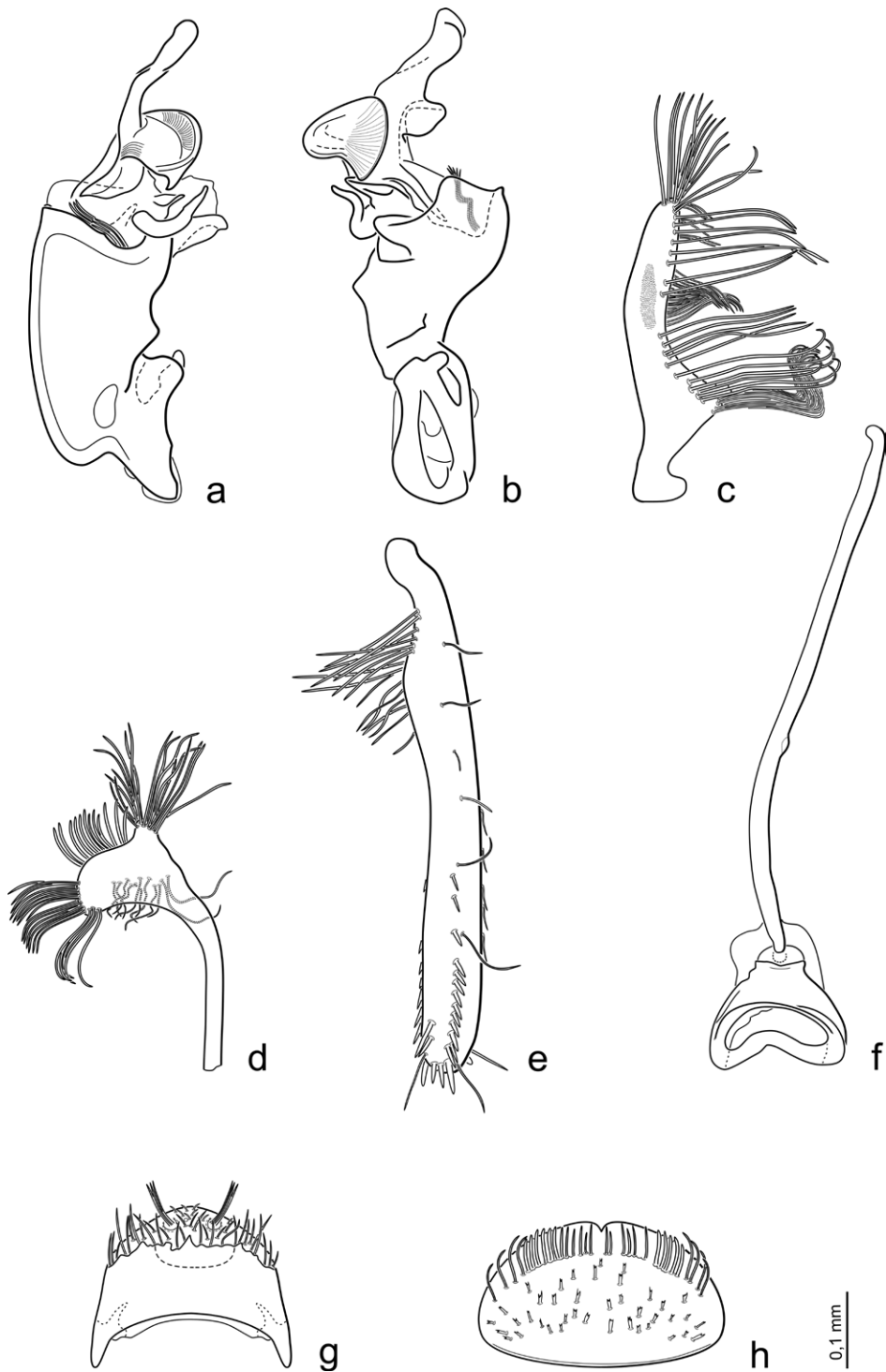


Fig. 2: *Hydraena motzfeldi*: a–b) aedeagus, lateral and ventral view; c–d) left and right paramere, lateral view; e) right metatibia of male; f) male sternite X and spiculum; g) gonocoxite; h) female tergite X.

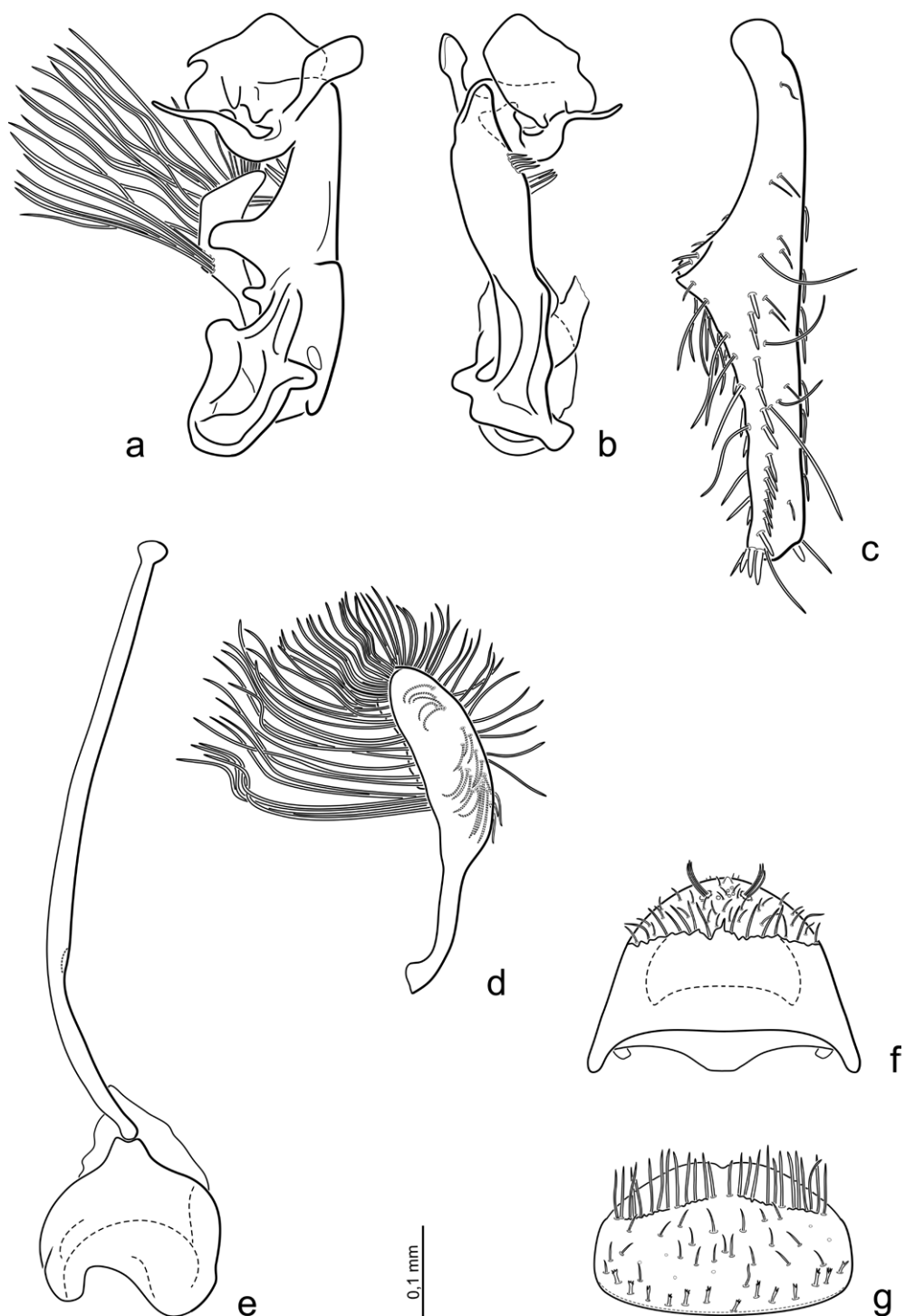


Fig. 3: *Hydraena proesei*: a–b) aedeagus, lateral and dorsal view; c) right metatibia of male; d) right paramere, lateral view; e) male sternite X and spiculum; f) gonocoxite; g) female tergite X.



***Hydraena (s.str.) proesei* sp. n.**

**Type locality** (Fig. 12): Small stream near Ramsar, 450 m, 36°53'21"N 50°34'43"E, Elburz Mts., Mazandaran Prov., northern Iran.

**Type material:** **Holotype** ♂ (NMW): "N-Iran, Prov. Mazandaran, NW-Elburz, Ramsar, 36°53'21"N 50°34'43"E, 450m, 02.06.2008 leg.A.Skale, small stream (21)". **Paratypes: IRAN:** 2 ♂♂, 4 ♀♀ (CSH): same locality data as holotype; 1 ♀ (CSH): "N-Iran, Prov. Mazandaran, NW- Elburz, Javaherdeh – Ramsar, 36°54'27"N, 50°36'28"E, 250m 02.06.2008, leg.A.Skale (20)"; 1 ♀ (CFS): "N-Iran,Prov.Mazandaran N-Elburz, Dohezar-Road, 36.35.11N, 50.47.67E 550m, 01.06.2008 leg. Dirk Frenzel"; 5 ♀♀ (CSH): "N-Iran, Prov. Mazandaran, N - Elburz, Abbasabad-Kalardasht [= Kelardasht] 36°34'66"N, 51°09'72"E, 1030m 05.06.2008, leg.A.Skale (25)"; 2 ♂♂, 10 ♀♀ (CFS, NME): "N-Iran, Prov.Mazandaran N-Elburz, Abbasabad – Kalardasht [= Kelardasht], 1030mNN, 36.34.66N, 51.09.72E 05.06.08[= 2008],leg.D.Frenzel"; 9 ♂♂, 11 ♀♀ (CPE, HMIM, NMW): "IRAN, Prov. Mazandaran [IR08-20] Chalus County, Elburz Mts., N-Slope, 10 km SE Abbasabad, small stream, 36°38'95.9"N, 51°12'22.5"E, 149m, 04.VI.2008, leg. A. Pütz"; 14 ♂♂, 5 ♀♀ (CPE): "IRAN, Prov. Mazandaran [IR08-20] Chalus County, Elburz Mts., N – Slope, 10 km SE Abbasabad, small stream, 36°38'95.9"N, 51°12'22.5"E, 149m, 04.VI.2008, leg. Nasserz adeh& Pütz"; 2 ♂♂, 2 ♀♀ (CSH): "N-Iran: Prov. Mazandaran, vic. Now Shahr, Kheiroud Kenar river waterfall, 36°32'40"N, 51°36'20"E 550m, 3.V.2010 leg. A.Skale (45)"; 6 ♂♂, 22 ♀♀ (CSH, HMIM, ZMK): "N-Iran: Prov. Mazandaran, vic. Now Shar, Kheiroud Kenar forest (river) 36°31'38"N, 51°38'46"E 880m, 2.V.2010 leg. A.Skale (43)" (one additional specimen, not designated as paratype, deposited for future DNA-analysis in NMW); 1 ♂ (NMPC): "IRAN, 28.–29.V.2006 Golestan prov., KORUD ABAD [= Kordabad] (stream valley with *Alnus*; at light) 36°53,1'N 54°53,2'E; 230 m Jiří Hájek & Pavel Chvojka leg."; **AZERBAIJAN:** 1 ♂ (SMNS): "AZERBAIJAN: Masally Istisu W Masally 300m, 18.–19.VI.1996 leg.W.SCHAWALLER"; 16 ♂♂, 10 ♀♀ (NMW): "AZERBAJDZHAN: Talysch Masally dist., Isty-Su 400 m, 22.5.2000 leg. Dolin (AT 9)".

**Description:** Habitus as in Plate 2 Fig. 8. Body length: 2.30–2.80 mm. Dark brown to black, appendages red-

dish brown, tips of palpi usually distinctly darkened. Clypeus sparsely punctate, medially glabrous or superficially microreticulate between punctures, laterally densely microreticulate. Frons moderately densely punctate, medially glabrous, laterally densely microreticulate. Pronotum transverse, subcordiform, lateral rim denticulate; anterior margin slightly concave; disc distinctly convex, moderately densely punctate, glabrous or superficially shagreened between punctures, oblique posterior admedian groove hardly apparent; lateral pronotal margins more densely punctate, rather distinctly reticulate. Elytra elongate, punctures small and rather densely arranged in 15 rather regular lines, intervals and interstices usually glabrous; explanate margin moderately wide, anteriorly denticulate, not reaching apex.

Metaventral plaques long and slender, posteriorly attenuate, distinctly sexually dimorphic. Border between pubescent and glabrous area of abdominal sternite VII distinctly bisinuous.

Legs sexually dimorphic.

Secondary sexual characters: Males on average larger than females. Pronotal disc on average more distinctly vaulted in male. Elytra more subparallel-sided in male, suboval (widest behind middle) in female; elytral apices widely rounded or subtruncate in male, narrowly rounded or subacuminate in female. Metaventral plaques of male carinate in basal third, more strongly acuminate; middle of metaventricle more deeply impressed in male. Legs, especially femora stronger in male, metafemur quite enormously inflated; male protibia enlarged, mesal face somewhat flattened in apical half, with brush of subapical setae; male mesotibia enlarged, very slightly curved, with a small subapical mesoventral tooth and a fringe of variously long, subapical mesoventral setae (longest ones at level of tooth); male metatibia (Fig. 2c) with a well developed acute tooth near midlength, with some bristles and longer setae along apical emargination. Apical three abdominal segments of male enlarged; pubescent area of abdominal sternite VII more strongly produced in male.

Male terminal sternite and spiculum (Fig. 3e): Sternite distinctly asymmetrical, apically deeply emarginate, apices rounded.

Aedeagus (Fig. 3a–b): Main piece more or less straight, in lateral view with two prominent expansions (a subbasal small one and a quite large subbasal one); subapically with about seven (3+4) rather short setae

on left side; phallobase distinctly asymmetrical. Distal lobe moderately large, with two conspicuous appendages, a large bulky one and a small, clubbed one; flagellum comparatively long, sinuous, gradually tapering toward apex. Parameres inserted near phallobase; right paramere (Fig. 2d) slender, in apical half moderately widened, with numerous moderately long to very long setae; left paramere much shorter, with moderately long to very long setae along apical and ventral margin.

Gonocoxite (Fig. 3f): Subtrapezoidal; with long apophyses. Inner plate projecting, medially produced, basal apophyses slightly projecting; cavea moderately large, basally concave.

Female tergite X (Fig. 3g): Transverse; anterior margin quite distinctly excised, with subapical fringe of rather long trichoid setae; disc with trichoid setae in apical 0.6 and squamose bifid subbasal setae.

**Differential diagnosis:** This species is closely related with *H. grandis*. The latter more or less agrees in general shape and male sexual characters of the legs. However, *H. grandis* differs in its distinctly larger size, larger and denser punctation (thus surface being more dull) and the male pronotal disc being less vaulted.

**Variability:** Anterior pronotal margin (especially behind eyes) and posterior pronotal margin often narrowly reddish brown; vaulting of pronotal disc variously strongly pronounced (in both sexes). The position of the acute tooth of the male metatibia varies between basal 0.4 to 0.5. Frons of female more or less vaulted between eyes.

**Ecology:** See comments above, under *H. motzfeldi*.

**Distribution:** Azerbaijan, northern Iran (Mazandaran, Golestan).

**Etymology:** The species is dedicated to my friend Herbert Präse † (Hof, Germany), “Bavarian microlepidoptera pope” (bayerischer Kleinschmetterlingspapst), to commemorate his death in 2009.

### *Hydraena riparia* species group

#### *Hydraena* (s.str.) *janeceki* Jäch, 1987

*Hydraena janeceki* Jäch 1987: 52.

**Type locality:** Lenkoran, Azerbaijan.

**Iranian material examined:** 1 ex. (CPE): “IRAN, Prov. Gilan [IR08-28] Fuman County, Talesh Mts., N-Slope, below Masuleh, Sifted, small stream, pools

37°09'69.0"N, 49°01'60.8"E, 688 m, 08.VI.2008, leg. A. Pütz”; 1 ex. (CPE): “IRAN, Prov. Mazandaran [IR08-24] Ramsar County, Elburz Mts., N-Slope, Eshkatechal, small stream, sifted, 1055m, 36°51'14.2"N, 50°33'22.0"E, 06.VI.2008, leg. A. Pütz”; 10 exs. (CSH, ZMK): “N-Iran, Prov. Mazandaran, NW-Elburz, Ramsar, 36°53'21"N, 50°34'43"E, 450m, 02.06.2008, leg. A. Skale (21)”; 3 exs. (CPE): “IRAN, Prov. Mazandaran [IR08-23] Ramsar County, Elburz Mts., N-Slope, Eshkatechal, small stream, 36°50'53.0"N, 50°34'64.4"E, 1458m, 06.VI.2008, leg. A. Pütz”; 1 ex. (CSH): “N-Iran, Prov. Mazandaran, N-Elburz, Dohesar-Road, 36°35'11"N, 50°47'67"E, 550m, 01.06.2008, leg. A. Skale (17)”; 4 exs. (CSH): “N-Iran, Prov. Mazandaran, N-Elburz, Dohesar-Road, River, 36°40'00"N, 50°49'57"E, 460m, 01.06.2008, leg. A. Skale (18)”; 2 exs. (CPE): “IRAN, Prov. Mazandaran [IR08-18] Chalus County, Elburz MTS., N-Slope, N Keldardasht, small stream, Fagus forest, 1245m, 36°35'64.9"N, 51°09'55.4"E, 03.VI.2008, leg. A. Pütz”; 3 ♂♂, 12 ♀♀ (CPE): “IRAN, Prov. Mazandaran [IR08 -20] Chalus County, Elburz Mts., N -Slope, 10 km SE Abbasabad, small stream, 36°38'95.9"N, 51°12'22.5"E, 149m, 04.VI.2008, leg. Nasserzadeh& Pütz”; 1 ex. (CSH): “N-Iran, Prov. Mazandaran, N-Elburz, Abbasabad- Kaldardasht [= Kelardasht], 36°34'66"N, 51°09'72"E. 1030m, 05.06.2008, leg. A. Skale (25)”; 22 exs. (CPE): “IRAN, Prov. Mazandaran [IR08-20] Chalus County, Elburz MTS., N-Slope, 10 km SE Abbasabad, small stream, Fagus forest, 149m, 36°38'95.9"N, 51°12'22.5"E, 04.VI.2008, leg. A. Pütz”; 11 exs. (CSH, ZMK): “N-Iran, Prov. Mazandaran, N-Elburz, SW-Now Shahr, 36°35'20"N, 51°34'05"E, 500m, 03.06.2008, leg. A. Skale, (23)”; 2 exs. (CSH): “N-Iran, Prov. Mazandaran, N-Elburz, Kolyak, 36°28'38"N, 51°39'88"E, 1628m, 04.06.2008, leg. A. Skale (24)”; 11 exs. (CPE): “IRAN, Prov. Mazandaran [IR08-09] Babol County Elburz Mts., N-Slope, 2 km SW Firuz Jah, 839m, small stream, 36°10'66.0"N, 52°38'90.1"E, 31.V.2008, leg. A. Pütz”; 4 exs. (CPE): “IRAN, Prov. Mazandaran [IR08-06] Sari County, Mohammadabad, Elburz Mts., N-Slope, 2 km SW Majid, 36°09'28.4"N, 53°12'88.9"E, 872m small stream, 30.V.2008, leg. A. Pütz”; 2 exs. (CPE): “IRAN, Prov. Mazandaran [IR08-04] Sari County, Elburz Mts., N-Slope, 1 km W Afra Chal, 36°14'11.9"N, 53°13'61.0"E, 520m small stream, leaves sifted,

29.V.2008, leg. A. Pütz"; 2 exs. (NMPC): "IRAN, 28.-29.V.2006 Golestan prov., KORUD ABAD [= Kordabad] (stream valley with *Alnus*; at light) 36°53,1'N 54°53,2'E; 230 m Jiri Hájek & Pavel Chvojka leg."

**Differential diagnosis:** Habitus as in Plate 3 Fig. 9. So far, this is the only member of the *Hydraena riparia* group known from Iran. It can be distinguished from the other Iranian species of the genus by the combination of the following characters: body length 2.00–2.20 mm; terminal segment of maxillary palpi apically darkened, asymmetrical in male; apical tergite of male distinctly excised apically; posterior half of male mesotibia slightly concave, with short spines (directed posteriad) and small denticles, mesal face of male metatibia slightly convex in posterior 0.2–0.5, inconspicuously denticulate in posterior 0.4.

Aedeagus (see JÄCH 1987: Fig. 6).

**Distribution:** Azerbaijan, northern Iran (Gilan, Golestan, Mazandaran).

### *Hydraena rufipes* species group

#### *Hydraena* (s.str.) *bakriensis* sp. n.

**Type locality** (Fig. 11): Residual pool in river valley near Deh Bakri, 1925 m, 29°05'N, 57°55'E, Kerman Prov., southern Iran.

**Type material:** **Holotype** ♂ (NMW): "IRAN 7.–8.IV.2000 Kerman Prov., 1925 m 5 km NE DEH BAKRI (29°05'N, 57°55'E)", "Iran 2000 Czech Biological Expedition J. HÁJEK & M. MIKÁT leg." **Paratypes:** 5 ♂♂, 2 ♀♀ (CSH, NMPC, NMW): "IRAN Kerman Prov. 5km NE Deh Bakri 29°05'N 57°55'E 7.–8.IV.2000", "Iran 2000 Czech Biological Expedition leg. J. Hájek & M. Mikát".

**Description:** Habitus as in Plate 3 Fig. 10. Body length: 1.70–1.95 mm. Brown, head usually darker, clypeus almost black, appendages reddish brown.

Clypeus sparsely punctate, conspicuously microreticulate between punctures. Frons moderately densely punctate, medially glabrous, laterally densely microreticulate.

Pronotum transverse, subcordiform, lateral rim denticulate; anterior margin slightly concave; disc convex, discal foveae distinct, conspicuously microreticulate; middle of disc sparsely punctate, interstices glabrous

or very superficially reticulate; lateral pronotal margins more densely punctate, rather distinctly reticulate.

Elytra elongate, parallel-sided; shoulders well developed; elytral punctures small and densely arranged in regular and irregular lines; apices separately to almost commonly rounded; explanate margin moderately wide, anteriorly distinctly serrate, posteriorly very weakly serrate, not reaching apex.

Metaventral plaques large, moderately wide, slightly converging anteriorly.

Legs sexually dimorphic.

Secondary sexual characters: Metaventral plaques of male very slightly narrower than in female; male metatibia (Fig. 4g) with moderate rounded mesal enlargement in apical 0.25–0.50. Abdominal sternite VIII of male enlarged.

Male terminal sternite and spiculum (Fig. 4d): Sternite subtriangular; not firmly connected with spiculum.

Aedeagus (Fig. 4a–c): Resembling *Hydraena frenzeli* Skale & Jäch, 2008. Main piece in lateral view remarkably angulate near middle, apical half much thinner than basal half, with four or five closely set setae on dorsal margin at base of apical half, and one subapical seta on right side; dorsal margin with conspicuous tooth-like projection near insertion of distal lobe; apex rounded; phallobase asymmetrical. Distal lobe consisting of two slender and elongate parts of different length. Parameres inserted basally; right paramere almost reaching apex of main piece, apically not distinctly enlarged, with a group of subapical setae on dorsal margin and a group of setae on ventral margin near apical 0.3; left paramere longer than main piece, sinuous, more strongly enlarged in apical half, with short to rather long setae along margins of apical half.

Gonocoxite (Fig. 4e): Subpentagonal, transverse, basal apophyses distinctly projecting; inner plate exposed, medially emarginate, cavea rather small.

Female tergite X (Fig. 4f): Subsemicircular; setae of subapical fringe trichoid, medially sparsely arranged, laterally longer; disc with squamose, bi- or trifold setae, and with a few short trichoid setae laterally.

**Differential diagnosis:** *Hydraena bakriensis* is obviously closely related with *H. frenzeli* Skale & Jäch from Lebanon, and possibly also with *H. fritzi* Jäch from Turkey. From these two species, it can be distinguished by the male tibiae and the aedeagus.

Externally, males of *Hydraena bakriensis* differ from all other Iranian species in the combination of the fol-

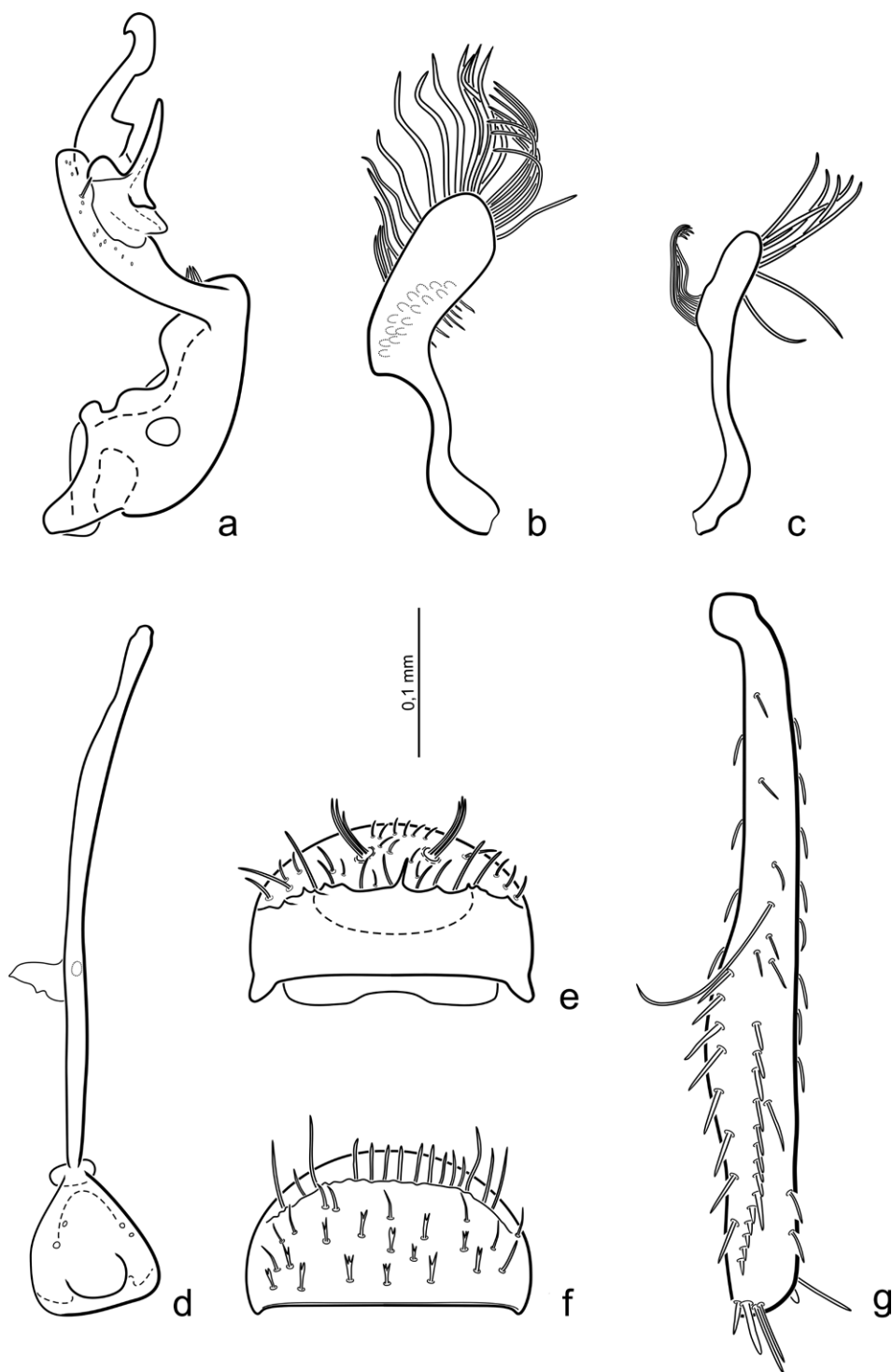


Fig. 4: *Hydraena bakriensis*: a) aedeagus, lateral view; b–c) left and right paramere, lateral view; d) male sternite X and spiculum; e) gonocoxite; f) female tergite X; g) right metatibia of male.

lowing characters: small size, brownish color, elytra more or less parallel-sided, metatibia with gentle swelling on apical 0.25–0.50.

**Variability:** The apices of the maxillary palpi are very inconspicuously darkened in the holotype and one paratype, they are rather distinctly darkened in one of the paratypes, and they are unicolored yellowish in the remaining five paratypes.

**Ecology:** This species was collected in a residual pool (diameter ca. 1 m) in a river valley with gravelly bottom, together with *Hydraena hajeki* (Hydraenidae), *Bidessus calabricus* Guignot, *Deronectes elmii* Fery & Hosseini and *Nebrioporus stearinus* Kolenati (Dytiscidae, det. J. Hájek).

**Distribution:** Southern Iran (Kerman).

**Etymology:** Named in reference to the type locality.

### *Hydraena* (s.str.) *feryi* sp. n.

**Type locality:** Small stream, gravel, no vegetation, 30.529° N 51.612° E, ca. 2018 m, near road Sepidan (= Ardakan) to Yasug (= Yasuj), Fars, southwestern Iran.

**Type material:** **Holotype** ♂ (NMW): “3,2 - IRAN: Fars, 15.8.1998 rd. Yasuj-Sepidan Vesek [= Vezek], 13km S Yasuj leg. Elmi & Fery (# 2107)”. **Paratypes:** 1 ♂ (NMW): “2,2 - IRAN: Kohkiluyeh & Boyer Ahmad, N Sisakht Tang-e-Namak, brook ca. 1900m, 14.8.1998 leg. Elmi & Fery (# 2103)”; 1 ♀ (NMW): “3,4 - IRAN: Fars, 15.8.1998 Sheh Pir, ca. 20km ESE Sepidan ca. 20km NE Dalin leg. Elmi & Fery (# 2108)”; 1 ♀ (NMW): “2 - IRAN: Fars, 13.8.1998 6km W Sepidan rd. Sepidan- Yasuj brook (Cheshmeh Saran) leg. Elmi & Fery (# 2098)”; 1 ♂, 1 ♀ (NMW): “IRAN: Fars, 21.9.1997 ca. 50km W Shiraz Dasht-e-Arzhan, 1900m leg. Schödl (27)”; 1 ♂, 1 ♀ (CSH): “S-Iran: Prov. Fars, vic. Qalat vill., 29°48'13"N, 52°19'11"E 2000–2150m, 28.IV.2010 leg. A.Skale (33)”; 3 ♂♂, 1 ♀ (CSH): “S-Iran: Prov. Fars, river above Qalat village, 29°47'99"N, 52°19'56"E 2240m, 28.IV.2010, leg. A. Skale (34)” (one additional specimen, not designated as paratype, deposited for future DNA-analysis in NMW).

**Description:** Habitus as in Plate 3 Fig. 11. Body length: 2.20–2.50 mm. Black, appendages reddish brown, tips of palpi comprehensively darkened. Clypeus sparsely punctate, medially glabrous or superficially microre-

ticulate between punctures, laterally densely microreticulate. Frons moderately densely punctate, medially glabrous, laterally densely microreticulate.

Pronotum transverse, moderately convergent to anterior angle, sinuately convergent to posterior angle; anterior margin slightly concave; disc convex, posterior foveae well impressed; middle of disc moderately densely punctate, interstices glabrous or superficially reticulate; lateral pronotal margins more densely punctate, rather distinctly reticulate.

Elytra elongate, subparallel-sided to ovoid, widest behind middle; shoulders prominent; elytral punctures small, partly star-shaped, and densely arranged in usually regular lines; intervals narrow, flat or slightly convex; and interstices small, more or less smooth; explanate margin moderately wide, anteriorly denticulate, not reaching apex; apices separately rounded.

Metaventral plaques large and very wide, hardly noticeably converging anteriorly. Legs sexually dimorphic. Secondary sexual characters: Metaventrite of male distinctly impressed between plaques in posterior half; male protrochanter distinctly ridged, male mesotibia very slightly curved in apical half, with very inconspicuous subapical swelling on mesal face; mesal face of male metatibia with distinct, bluntly rounded tooth in proximal 0.4, posterior face weakly concave in posterior 0.2–0.5; apical three abdominal segments of male enlarged.

Male terminal sternite and spiculum (Fig. 5b): Sternite toilet seat-like; not firmly connected with spiculum.

Aedeagus (Fig. 5a): Main piece very stout in basal half, medially angulate and distinctly thinner in apical half (lateral view), with a row of about four moderately long setae on dorsal margin near base of apical half; phallobase distinctly asymmetrical. Distal lobe with two conspicuous elongate projections, both directed dorsoapically: one rather strongly sclerotized, more or less straight, second less strongly sclerotized, flagellum-like, strongly curved. Parameres inserted near phallobase; right paramere almost reaching base of distal lobe, foot-like, with two rows of setae, one at apex, second at “heel”, and a few scattered setae near “sole”; left paramere longer than main piece, sinuous, moderately enlarged in apical half, margins in apical half with three clusters of moderately long setae and a longitudinal row of about ten conspicuous vermiform setae in basal 0.50–0.75 of median face of paramere.

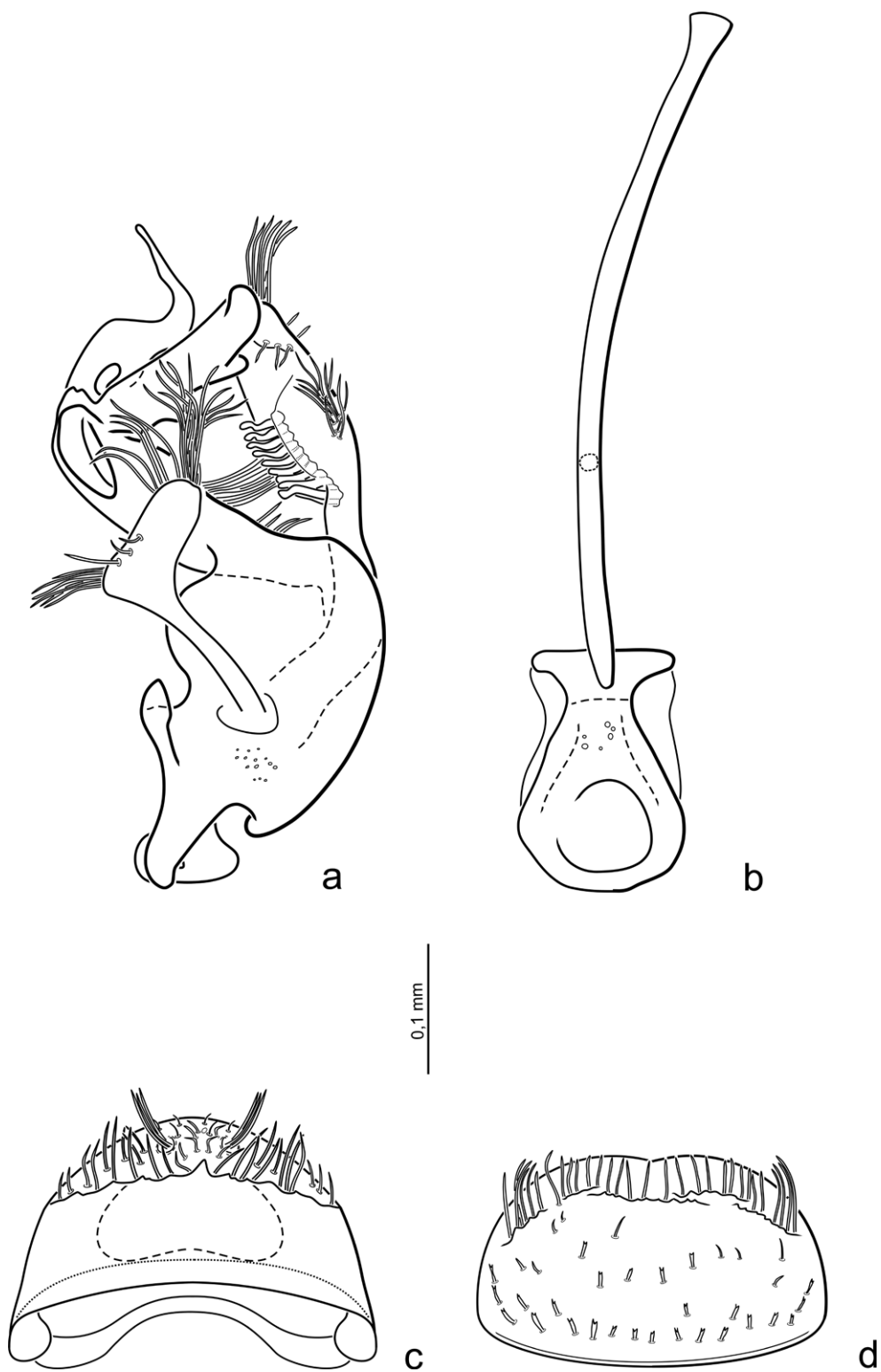


Fig. 5: *Hydraena feryi*: a) aedeagus, lateral view; b) male sternite X and spiculum; c) gonocoxite; d) female tergite X.

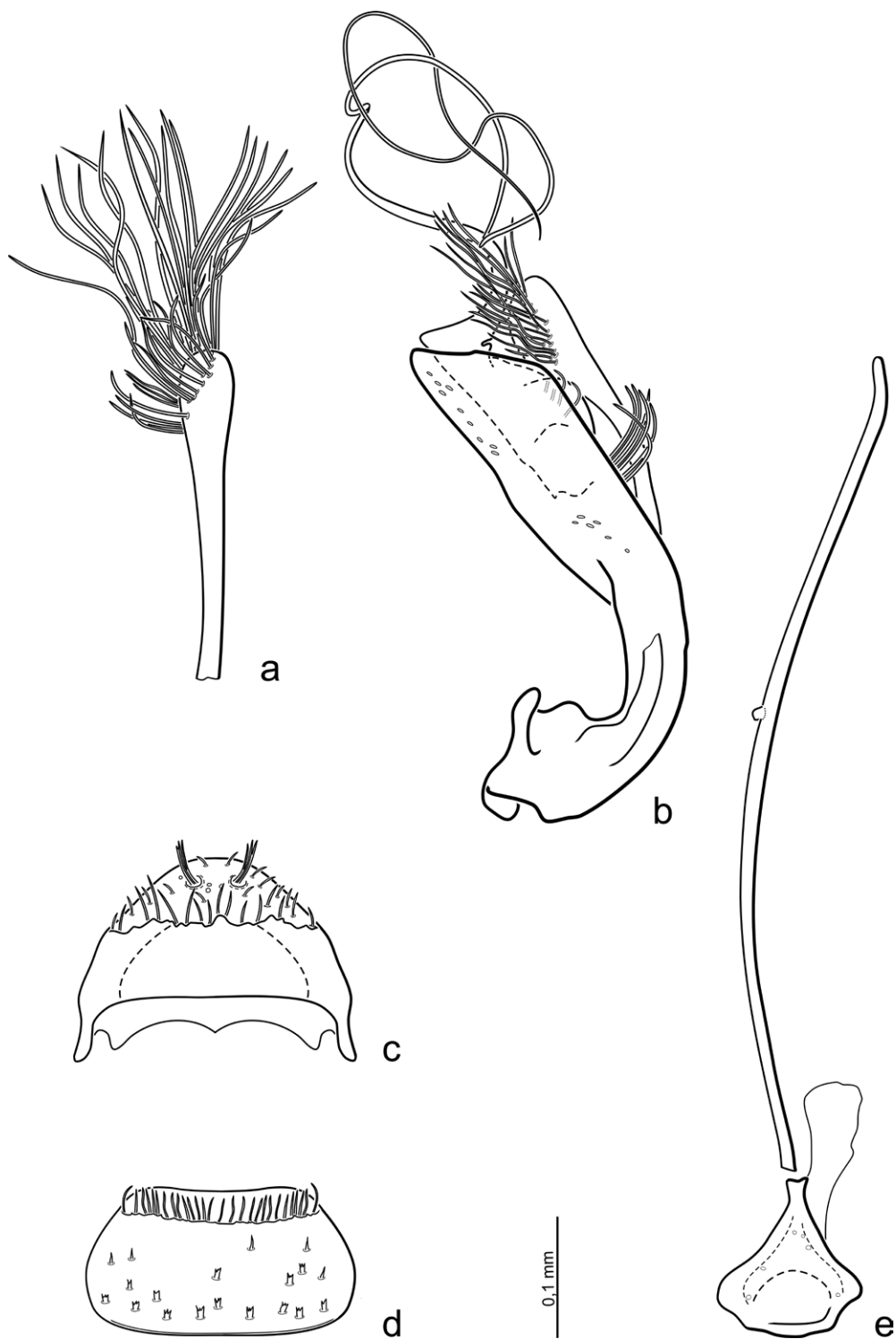


Fig. 6: *Hydraena hajeki*: a) right paramere, lateral view; b) aedeagus, lateral view; c) gonocoxite; d) female tergite X; e) male sternite X and spiculum.

Gonocoxite (Fig. 5c): Transverse, with a small basal hyaline area, basal apophyses strongly projecting; inner plate exposed, distinctly emarginate medially; cavae moderately large.

Female tergite X (Fig. 5d): Transverse, subrectangular, anterior margin slightly excised medially; setae of subapical fringe trichoid, mostly short, just reaching apical margin, lateral ones distinctly longer; disc with very small bifid squamose setae and with few short trichoid ones.

**Differential diagnosis:** *Hydraena feryi* is probably a member of the *H. eichleri* complex (as defined by JÄCH & KASAPOĞLU 2006). It is obviously related with some species from Turkey (e.g. *H. eichleri* Orchymont, *H. emineae* Jäch & Kasapoğlu, *H. eucnemis* Janssens, *H. schmidi* Jäch & Díaz), from Azerbaijan (*H. waldeheimi* Jäch), and from Iran (*H. orientalis*, *H. persica*, *H. nurabadensis*). Externally, it strongly resembles *H. orientalis*, from which it can be distinguished by the elytral striae being more regular, the metaventral plaques being wider, the mesotibial subapical swelling on mesal face being slightly smaller, by the posterior face of the metatibia being concave in posterior 0.2–0.5, lacking a fringe of moderately densely set, thin, long bristles in posterior half.

**Ecology:** This species was collected together with *Hydraena nurabadensis* (Hydraenidae), *Bidessus calabricus*, *Nebioporus airumulus* Kolenati, *N. stearinus*, *Laccophilus hyalinus* Degeer (Dytiscidae, det. H. Fery) and *Gyrinus distinctus* Aubé (Gyrinidae, det. H. Fery). For a habitat photograph see Fig. 13.

**Distribution:** Southwestern Iran (Fars, Kohkiluyeh & Buyer Ahmad).

**Etymology:** This species is named after Hans Fery (Berlin), in recognition of his contribution to the taxonomy of Dytiscidae.

### *Hydraena* (s.str.) *hajeki* sp. n.

**Type locality:** Stream near Bidkhan village, ca. 29.50° N 56.24° E, SW Bardsir (= Mashiz), ca. 60 km SW of Kerman, Kerman Prov., southern Iran.

**Type material:** **Holotype** ♂ (NMW): “IRAN: Kerman Prov. (IR23) Bardsir, Bitkhan [= Bidkhan] stream near Bitkhan [= Bidkhan] village 26.07.2003, leg. Pešić”.

**Paratypes:** 24 ♂♂, 35 ♀♀ (CSH, HMIM, NMPC,

NMW): “IRAN: Kerman Prov. 5km NE Deh Bakri 29°05'N 57°55'E 7.–8.4.2000”, “IRAN 2000 Czech Biological Expedition leg. J. Hajek & M. Mikát”.

**Description:** Habitus as in Plate 3 Fig. 12. Body length: 2.10–2.30 mm. Black, appendages reddish brown, tips of palpi distinctly darkened. Clypeus sparsely punctate and medially distinctly microreticulate between punctures, anterior margin glabrous. Frons moderately densely punctate, medially glabrous or microreticulate, laterally densely microreticulate.

Pronotum transverse, subcordiform; lateral rim denticulate; anterior margin slightly concave; disc convex, discal foveae distinct, conspicuously microreticulate; middle of disc sparsely punctate, interstices usually densely microreticulate; pronotal margins more densely punctate, distinctly reticulate; discal foveae conspicuously perceptible.

Elytra elongate, subparallel-sided to suboval; elytral punctures small, star-shaped, very densely arranged in 15 quite regular lines; intervals and interstices glabrous or rugose; explanate margin moderately wide, anteriorly denticulate; apices acuminate, separately or almost commonly rounded.

Metaventral plaques moderately wide, very slightly converging anteriorly.

Legs not strongly sexually dimorphic.

Secondary sexual characters: Metaventral plaques slightly more slender in male; metaventrite of male more distinctly impressed between plaques in posterior half. All femora of male enlarged; male mesotibia very slightly curved, mesal face subapically inconspicuously denticulate (usually with three tiny denticles and a bluntly rounded gibbosity); mesal face of male metatibia hardly noticeably widened in posterior 0.2–0.5; apical three abdominal segments of male enlarged.

Male terminal sternite and spiculum (Fig. 6e): Sternite subtriangular, attenuate subapically; not firmly connected with spiculum.

Aedeagus (Fig. 6a–b): Main piece strongly curved subbasally, then straight, apex wide, obliquely truncate (lateral view), dorsal margin with two, rather short, curved setae subapically and with six or seven moderately long, curved setae in basal 0.6; phallobase asymmetrical. Distal lobe not very complex, but with very long, looped flagellum. Parameres inserted near base; right paramere almost reaching apex of main piece, apically moderately enlarged, with a group of moderately



long to very long apical and subapical setae on ventral side; left paramere slightly longer than main piece, moderately enlarged apically, ventral margin subapically with a group of setae of moderate length.

Gonocoxite (Fig. 6c): Subtriangular, apically subtruncate, basal apophyses very long; inner plate projecting, laterally retracted, medially acuminate, cavea very large. Female tergite X (Fig. 6d): Transverse; anterior margin concave, subapical fringe with rather short trichoid setae; disc in basal half with short squamose, bi- to multifid setae, apical half with very few very short trichoid setae.

**Differential diagnosis:** On account of its weakly developed sexual dimorphism this species is somewhat similar to *H. verstraeteni*. It is, however, distinguished externally from the latter by the less elongate body form and by the denticulate male mesotibia.

**Discussion:** At present it is not clear where this species should be placed phylogenetically. It is probably very basal within the *H. rufipes* group.

**Ecology:** The holotype was collected together with *Ilybiosoma kermanensis* (Balfour-Browne) (det. H. Fery). The paratypes were collected in a residual pool with gravel bottom (diameter ca. 1m), together with *Hydraena bakriensis* (Hydraenidae), *Bidessus calabricus*, *Deronectes elmii* and *Nebriporus stearinus* (Dytiscidae, det. J. Hájek). For habitat photograph see Fig. 11.

**Distribution:** Southern Iran (Kerman).

**Etymology:** This species is named after Jiří Hájek (Národní muzeum, Praha, Czech Republic), who collected the paratypes.

### *Hydraena* (s.str.) *nurabadensis* sp. n.

**Type locality:** Small stream in grassland, near Nurabad, ca. 2000 m, 30°21'N, 51°30'E, Fars Prov., southwestern Iran.

**Type material:** **Holotype** ♂ (NMW): "IRAN: Fars 20km N Nurabad 25.4.1996, rivulet leg. Wewalka (14)". **Paratypes:** 2 ♂♂, 8 ♀♀ (NMW): same locality data as holotype; 6 ♂♂, 3 ♀♀ (HMIM, NMW): "IRAN: Fars 30km N Nurabad 25.4.1996, rivulet leg. Wewalka (13)"; 1 ♂ (NMW): "IRAN: Fars, 22.9.1997 75km NW Shiraz Sarbast, 2000m leg. Schödl (28)"; 6 ♂♂, 9 ♀♀ (CSH, NMW): "3,2 – IRAN: Fars, 15.8.1998 rd. Yasuj- Sepidan Vesek, 13km S Yasuj leg. Elmi & Fery (# 2107)".

**Description:** Habitus as in Plate 4 Fig. 13. Body length: 2.30–2.70 mm. Black, appendages reddish brown, tips of palpi distinctly darkened. Clypeus sparsely punctate, medially glabrous or more or less superficially microreticulate between punctures, laterally densely microreticulate. Frons moderately densely punctate, medially glabrous, laterally densely microreticulate.

Pronotum transverse, moderately convergent to anterior angle, sinuately convergent to posterior angle; anterior margin slightly concave; disc convex, posterior foveae well impressed; middle of disc moderately densely punctate, interstices glabrous or superficially reticulate; lateral pronotal margins more densely punctate, rather distinctly reticulate.

Elytra wide, subparallel-sided; shoulders prominent; elytral punctures small, partly star-shaped, and densely arranged in 15 quite regular lines; intervals narrow, flat or slightly convex; interstices small, more or less smooth; explanate margin moderately wide, anteriorly denticulate, not reaching apex; apices widely rounded, almost subtruncate.

Legs sexually dimorphic.

Metaventral plaques large and very wide, hardly noticeably converging anteriorly. Legs sexually dimorphic. Secondary sexual characters: Males on average slightly larger than females. Metaventricle of male more strongly impressed between plaques in posterior half. Legs, especially femora stronger than in female; male prothorchanter distinctly ridged; male protibia slightly curved, subapically bluntly toothed on ventral face; male mesotibia very slightly curved in apical half; male metatibia (Fig. 7d) curved, lateral margin distinctly convex, posterior face flattened or even partly concave, mesal margin of posterior face with prominent rounded extension medially, with distinct ridge in apical 0.25 and a fringe of not very long setae in apical half, mesal face of male metatibia flattened or partly concave, with numerous setae in posterior half, anterior margin of mesal face with two prominent rounded extensions subapically, anterior one slightly larger than posterior one. Apical three abdominal segments of male enlarged.

Male terminal sternite and spiculum (Fig. 7c): Sternite somewhat toilet seat-like, basal angles distinctly produced laterad; not firmly connected with spiculum.

Aedeagus (Fig. 7a–b): Main piece stout, apically strongly attenuate, spur-like, pointing ventrad, acute (lateral view); apical spur with one tiny seta on dor-

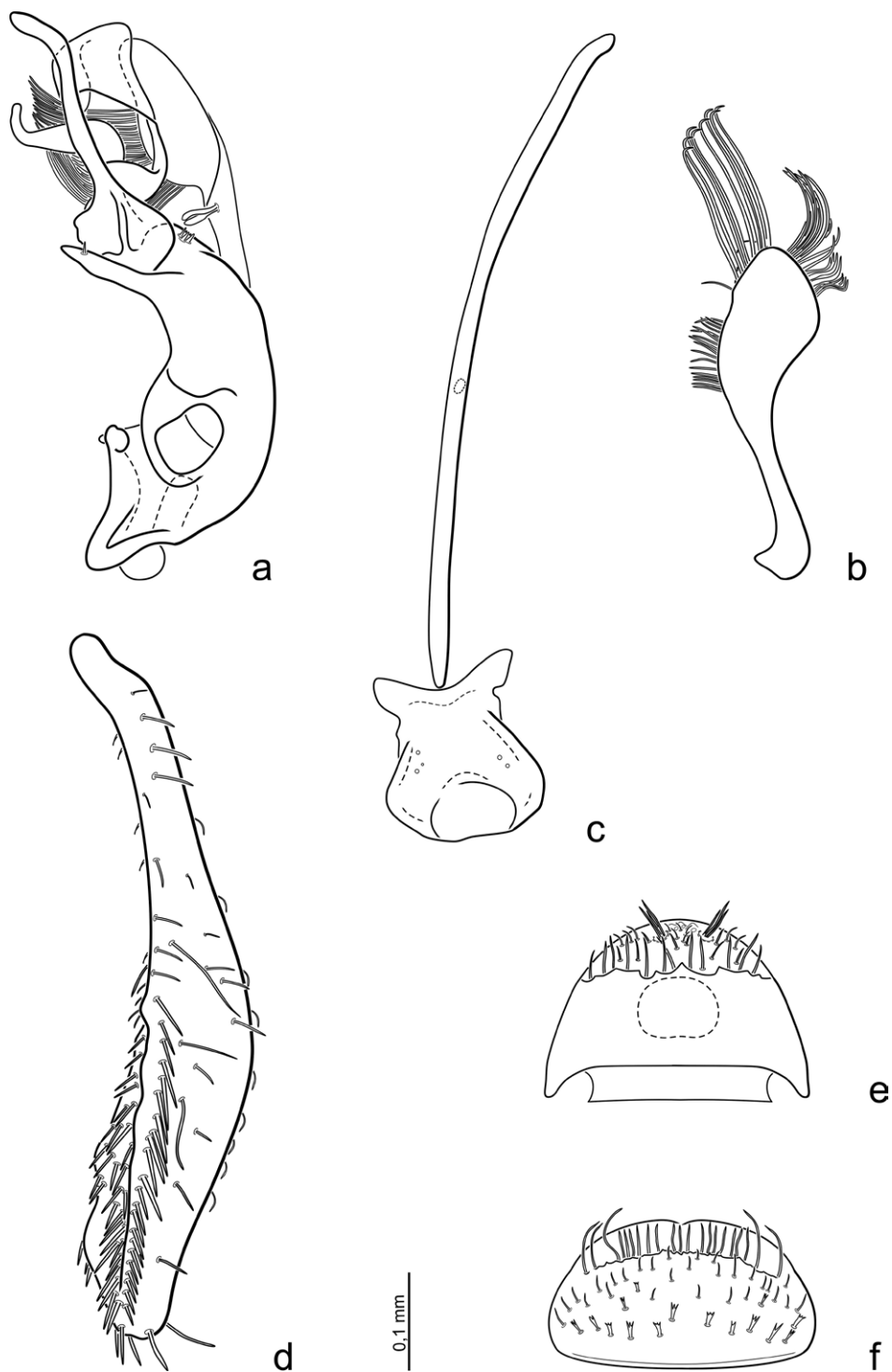


Fig. 7: *Hydraena nurabadensis*: a) aedeagus, lateral view; b) right paramere, lateral view; c) male sternite X and spiculum; d) right metatibia of male; e) gonocoxite; f) female tergite X.

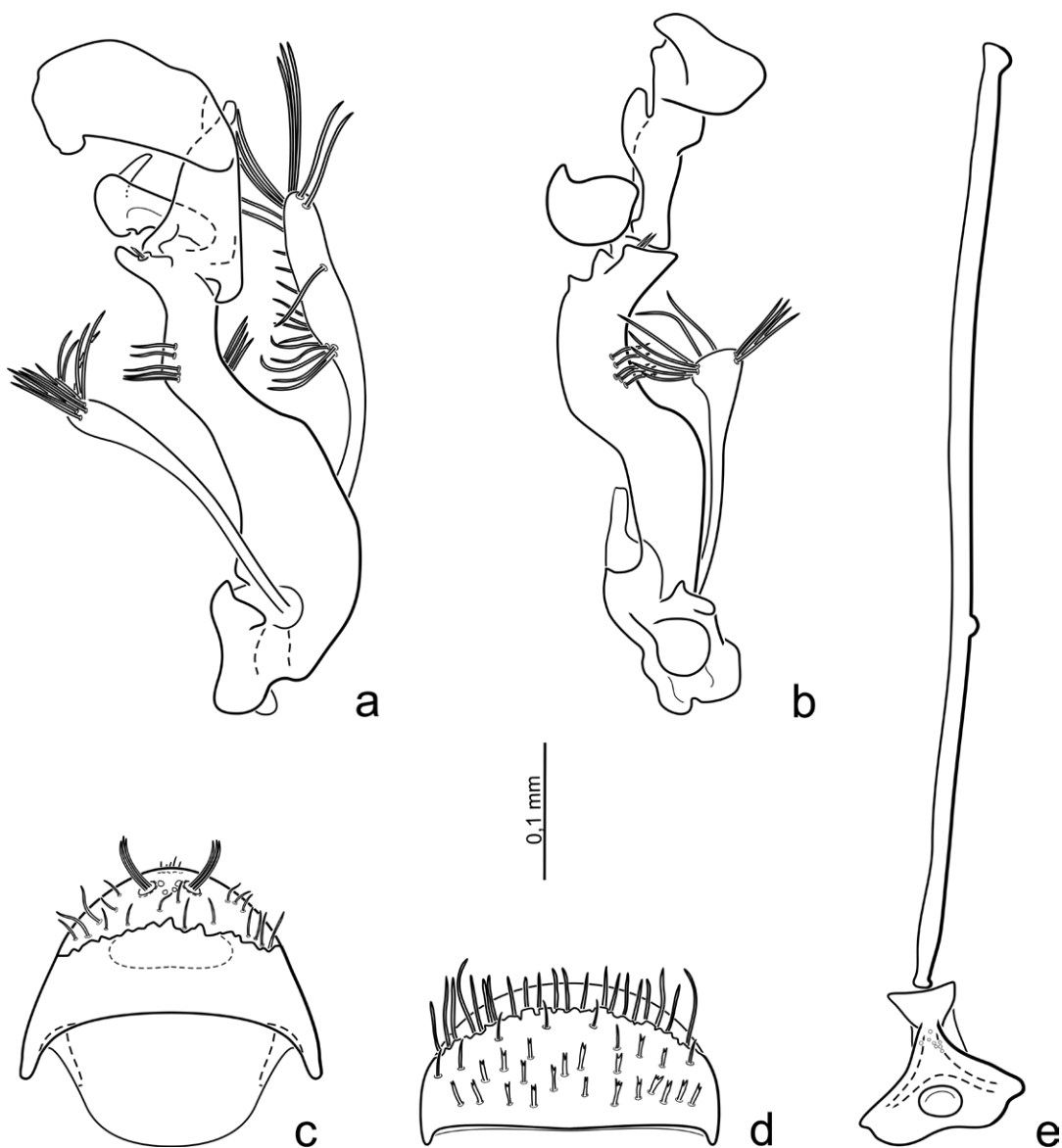


Fig. 8: *Hydraena parysatis*, specimen from Armenia: a–b) aedeagus, lateral and ventral view; c) gonocoxite; d) female tergite X; e) male sternite X and spiculum.

sal side just before apex, and with three very short, densely set, peg-like setae on dorsal face near base of distal lobe; phallobase distinctly asymmetrical. Distal lobe with three major appendages, longest one elongate and slender, sinuous, bulbous at base, second one almost as long, flattened, medially twisted, third one similar to second one, but distinctly shorter. Parameres inserted near phallobase; right paramere sinuous,

spatulate, setae varying from short to long, forming several rows along margins of apex and ventral margin of apical half; left paramere considerably longer than main piece, strongly enlarged in apical 0.3, with a row of very long setae along ventral margin of basal 0.7 of enlarged part, and with two short, conspicuously clubbed setae on mesal face, before base of enlarged part.

Gonocoxite (Fig. 7e): Subsemicircular; basal apophyses distinct; inner plate surpassing outer plate, base straight, laterally abruptly constricted, cavea moderately large.

Female tergite X (Fig. 7f): Transverse, apical margin medially excised; setae of subapical fringe trichoid, short, laterally with a few longer ones; disc in apical half with short trichoid setae, in basal half with short bi- and multifid squamose setae.

**Differential diagnosis:** *Hydraena nurabadensis* is a member of the *H. eichleri* complex (see under *H. feryi*). It can be distinguished from all other species of this complex by the remarkable shape of the male metatibia (Fig. 7d).

**Ecology:** This species was collected together with *Ochthebius ragusae* Kuwert, *O. scitulus* Ferro (Hydraenidae), *Hydroglyphus geminus*, *Hydroporus tessellatus* Drapiez, *Deronectes longipes* Sharp (Dytiscidae, det. Wewalka), and *Gyrinus distinctus* (Gyrinidae, det. Wewalka).

**Distribution:** Southwestern Iran (Fars).

**Etymology:** Named in reference to the type locality.

### *Hydraena* (s.str.) *orientalis* Breit, 1916

*Hydraena orientalis* Breit 1916: 54.

**Type locality:** Bojnurd, Kuh-e Aladagh, North Khorasan Prov., Iran.

**Iranian material examined:** 1 ♂, teneral (NMW): "IRAN: Khorasan Prov. Mashad-Kalat road 35km to spring (IR 66a) leg. V.Pesic 06.05.2005"; 1 ♂, 1 ♀ (NMW): "IRAN: Khorasan Prov. spring near Mashad [= Mashad] town small rheocrenic spring 6.6.[20]05 leg. V.Pesic (IR 68a)".

**Taxonomy:** The taxonomy of this species is still in need of revision. The three Iranian specimens listed above very probably belong to *H. orientalis*. However, specimens from Khrebet Bol'shoy Balkhan (western Turkmenistan), deposited at the NMW differ from the specimens from Mashad in the less prominent mesotibial tooth and in some minor aedeagal characters. More material has to be examined to clarify the taxonomy and distribution of this species.

**Differential diagnosis:** Habitus as in Plate 4 Fig. 14. Body length: 2.25–2.50 mm. On account of external similarities this species resembles *Hydraena feryi*, from

which it can be distinguished in the following characters: elytral striae less regular; metaventral plaques slenderer; mesotibial subapical swelling on mesal face slightly larger; posterior face of metatibia not concave in posterior 0.2–0.5, with fringe of moderately densely set, thin, long bristles in posterior half.

Aedeagus (see JACH 1987: Fig. 2): Characterized by the enormously enlarged right paramere.

**Distribution:** Northeastern Iran (North Khorasan, Razavi Khorasan), Turkmenistan.

### *Hydraena* (s.str.) *parysatis* Janssens, 1981

*Hydraena parysatis* Janssens 1981:

334. – JÄCH & SKALE 2011.

**Type locality:** Kandovan, Elburz Mts., 2545 m, Tehran Prov., northern Iran.

**Type material:** **Holotype** ♂ (NMPC): "N. Iran, C. Elburz Kandavan [= Kandovan], Val. 2545 m 10.-11. 8. 1970", "Loc. no. 86 Exp. Nat. Mus. Praha", "Prép. Micr. No 730109.1", "TYPE", "E. Janssens det., 1973 *Hydraena* s.str. *parysatis* n.sp.".

**Additional material examined:** 7 exs. (2 exs. CSH, 5 exs. NMW): Southern Armenia, Kapan – Kadzharan, Darmanadzor gorge, ca. 1700 m, 30.V.2001, leg. H. Shaverdo "(74)"; 1 ♀ (NMW): same label data, but "(75)".

**Note:** The aedeagus of the holotype is crunched under a cover glass and mutilated (see original description by JANSSENS 1981: Fig. 1). Although we have not seen any undissected males from Iran, we think that the specimens from Armenia are identical with *H. parysatis*. However, this can only be confirmed after undissected material from Iran becomes available.

**Redescription** (based on specimens from Armenia): Habitus as in Plate 4 Fig. 15. Body length: 2.05–2.20 mm. Black, appendages reddish brown, tips of palpi distinctly darkened.

Clypeus sparsely punctate, laterally densely microreticulate between punctures. Frons moderately densely punctate, medially glabrous between punctures, laterally densely microreticulate.

Pronotum transverse, subcordiform, lateral rim denticulate; anterior margin slightly concave; disc convex, sparsely punctate, interstices glabrous or very superficially reticulate; discal posterior foveae usually hardly apparent, rarely distinct, lateral pronotal

margins more densely punctate, rather distinctly reticulate. Elytra suboval; shoulders moderately well developed; elytral punctures not very densely arranged in 15 partly irregular, partly fused lines; intervals and interstices more or less glabrous; explanate margin moderately wide, not reaching apex, anteriorly denticulate. Metaventral plaques sexually dimorphic, wide, slightly converging anteriorly.

Legs sexually dimorphic.

Secondary sexual characters: Males on average larger than females. Elytral apices of male wide, almost subtruncate, more acuminate in female. Metaventral plaques of male distinctly wider. Femora very slightly stronger in male; male mesotibia slightly and evenly curved, with short spines on distal 0.2–0.4 of mesal face and an inconspicuous subapical swelling; male metatibia with a rather distinct subapical swelling. Apical three abdominal segments of male enlarged.

Male terminal sternite and spiculum (Fig. 8e): Sternite subsymmetrical, very small, subtriangular, base truncate; spiculum very long in relation to small sternite, not firmly connected with sternite.

Aedeagus (Fig. 8a–b): Main piece elongate, sinuous, gradually tapering toward pointed apex, two very small, closely set, very short setae on dorsal margin just before apex, and two rows of longer setae in apical 0.25 (four sinistro-dorsal and five dextro-ventral). Distal lobe with two major appendages, largest one blunt, strongly angulate in middle (lateral view), second distinctly shorter, with spur-like apex; phallobase strongly asymmetrical. Parameres simple, left one longer than right one.

Gonocoxite (Fig. 8c): Subtriangular, subcrescentic, apically rounded, basal margin concave, apophyses distinctly produced; inner plate very widely projecting basally, strongly convex, cavea small, transverse.

Female tergite X (Fig. 8d): Transverse, apical margin convex; subapical fringe densely set with moderately long trichoid setae, laterally with some longer ones; disc covered with numerous bi- and trifid squamose setae, which are apically replaced by a few trichoid setae.

**Differential diagnosis:** Among the Iranian species, *Hydraena parysatis* is characterized by the somewhat irregular elytral striae, thereby resembling *H. tauricola*. It can be distinguished from the latter mainly in the presence of a rather distinct subapical swelling on the male metatibia.

**Distribution:** Armenia and northern Iran (Tehran). This species has never been rediscovered in Iran, despite the fact that its type locality is in one of the best explored areas of this country.

### *Hydraena* (s.str.) *persica* Janssens, 1981

*Hydraena persica* Janssens 1981: 333.

**Type locality:** Darband Sar, Elburz Mts., 2500–3000 m, Tehran Prov., northern Iran.

Contrastingly, in the original description (JANSSENS 1981: 334, 335) the type locality of *H. persica* is the same as that of *H. parysatis*: “N. Iran, Elburz, Kandavan, Val., 2545 m, 11. VIII. 1970 (loc. no. 86)”. However, the locality data of the labels of the holotype suggest that the author had confounded the locality data.

**Type material:** Holotype ♂ (NMPC): “N Iran, C Elburz Val, Darband Sar 2500–3000 m, 16. 7. 70”, “Loc. no. 58 Exp. Nat. Mus. Praha”, “Prép. Micr. No 730109.2”, “TYPE”, “E. Janssens det., 1973 *Hydraena* s.str. [str.] *persica* n.sp.”.

**Note:** The aedeagus of the holotype is crunched under a cover glass and mutilated (see original description by JANSSENS 1981: Fig. 1).

**Additional material examined:** 9 exs. (CPE, HMIM): “IRAN, Prov. Zanzjan [= Zanjan] [IR08–31] Abbar County, 3 km north Gilvan spring, small stream, 36°49'08.8"N, 49°08'32.6"E, 529 m, 09.VI.2008, leg. A. Pütz”; 1 ♂, 2 ♀♀ (CSH): “N-Iran, Prov. Teheran, S-Elburz, Aghasht, 36°00'20"N 50°52'84"E, 1600–1700m, 27.05.2008, leg.A.Skale (04)”; 1 ex. (NMW): “IRAN: Tehran Prov. (IR47) Sijan stream in Sijan village under Dareh Bridge 14.08.2003 leg. Pesic & Saboori”; 4 exs. (HMIM): “TEHRAN, Dizin, Ski-resort, 3225m., N36 2 18.7 E51 26 27.0 10.VI. 2008 leg.Nass. [= Nassezadeh]/Serri/Putz”, “IRAN Hayk Mirzayans Insect Museum (HMIM)”; 1 ♂ (SMNS): “IRAN Elburs Geb. N Teheran, Tal Ö [= valley east of] Fasham”, “5.VII.1978 2350–2900 m leg.Martens & Pieper”, “*Hydraena persica* JANSS. Det. Jäch 91”; 3 exs. (NMW): “TEHRAN, Fasham Ahar 2100m., N35 56 11.3 E51 27 8.3 10.VI. 2008 leg.Nass.[= Nasserzadeh]/Serri/Putz”, “IRAN Hayk Mirzayans Insect Museum (HMIM)”; 1 ♂ (NMW): “Iran:Elburs,Kendevan-Pass, ca. 3000m”, “3.–9.VII. 1936 leg.Dr.R.EBNER”, “Österreichische Demawend – Exped. 1936”, 9 exs. (NMW): “IRAN,

Tehran Province N Tehran, Darake: Palanchal (Elburz Mts), 2250m N 35°51'09" E 051°22'47" 31.05.2010, leg. Frisch"; 1 ♂ (CSH): "N-Iran, Prov. Mazandaran, C-Elburz, Kandovan, Tunnel, 36°09'61"N, 51°19'31"E, 2650m 05.06.2008, leg.A.Skale (26)"; 3 exs. (CPE): "IRAN, North Teheran [IR08-34] S Ahar, small stream, 35°56'11,3"N, 51°27'08,3"E, 2100 m, 10.VI.2008, leg. A. Pütz"; 7 exs. (CSH, NMPC): "IRAN, 31.V.-1.VI.2006 Mazandaran prov., "Alborz" Mts. (alpine meadow, lake) 36°14,0'N 51°26,0'E; 2855-3020 m Jiri Håjek & Pavel Chvojka leg"; 1 ♂, 2 ♀♀ (NMW): "IRAN: Tehran, Lasem 14 km SE de Polur 2616m, N35°48'27.1" E52°11'44.4", 14.9.07 [= 2007] P. Ponek leg. (14-2)".

**Diagnosis:** Habitus as in Plate 4 Fig. 16. Body length: 2.25-2.55 mm. Quite similar to *Hydraena nurabadensis*, from which it can be distinguished in the following external characters: Metaventral plaques slightly slenderer; male protibia hardly noticeably enlarged subapically on mesal face (without distinct tooth), male mesotibia straight, anterior margin of mesal face of male metatibia without two prominent rounded extensions subapically, fringe of setae in apical 0.5 very dense. Male terminal sternite and spiculum (Fig. 9d): Sternite subrectangular, longer than wide, slightly and asymmetrically widened subapically; not firmly connected with spiculum.

Aedeagus (Fig. 9a-c): Main piece more or less straight, apical 0.2 (apical extension) angulately curved ventrad in lateral view; basal 0.8 stout with large tooth-like ventral projection, apical 0.2 slender, apex bluntly rounded; dorsal face with two clusters of about seven comparatively short setae, one on middle of apical extension and one near base of distal lobe. Distal lobe with two major appendages, largest one elongate, distinctly curved in apical half, second one extended into short flagellum; phallobase distinctly asymmetrical. Parameres inserted near phallobase; right paramere foot-like, setae moderately long to long, forming rows along margins of apex and on ventral margin of basal half of enlarged part; left paramere longer than main piece, strongly enlarged in apical 0.3, with three rows of short to very long setae along margins.

Gonocoxite (Fig. 9e): Subsemicircular; basal apophyses short, slanting; inner plate not surpassing outer plate, cavea very small.

Female tergite X (Fig. 9f): Transverse, apical margin convex, not excised medially; subapical fringe with

short to moderately long trichoid setae, laterally with some longer, curved ones; disc anteriorly and laterally with sparsely set trichoid setae, basally with a few bi- or trifid squamose setae.

**Distribution:** Northern Iran (Mazandaran, Tehran, Zanjan).

### *Hydraena* (s.str.) *tauricola* Jäch, 1988

*Hydraena tauricola* Jäch 1988: 244.

**Type locality:** Pamuk River, between Tarsus and Namlun, ca. 200 m, Mersin Prov., southern Turkey.

**Iranian material examined:** 4 exs. (CPE, CSH, NMW): "IRAN, Prov. Zanzjan [= Zanjan] [IR08-31] Abbar County, 3 km north Gilvan spring, small stream, 36°49'08.8"N, 49°08'32.6"E, 529 m, 09.VI.2008, leg. A. Pütz".

**Note:** The aedeagus of this species is quite variable. However, after examination of numerous specimens from Armenia, Turkey, and Iran we were not able to detect significant differences of taxonomic importance.

**Differential diagnosis:** Habitus as in Plate 5 Fig. 17. *Hydraena tauricola* resembles *H. parysatis* in the elytral punctation. Its body size (2.0 mm) and asymmetrical metatibial tooth (directed apicad) on posterior 0.3-0.5 distinguish this species from all other Iranian members of the group.

Aedeagus (see JACH 1988b: Fig. 2).

**Distribution:** Armenia, eastern Turkey, northwestern Iran (Zanjan) (first record).

### *Hydraena* (s.str.) *verstraeteni* Ferro, 1984

*Hydraena verstraeteni* Ferro 1984: 69.

**Type locality:** Isin, Bandar Abbas, Hormozgan Prov., southern Iran.

**Type material:** **Holotype** ♂ (NMPC): "S Iran Isin 26. 5. 1973", "Loc. No. 213 Exp. Nat. Mus. Praha", "Hydraena s.str. verstraeteni det. FERRO 83 HOLO-TYPUS". **Paratype** ♂ (NMPC): same label data as Holotype; "Hydraena s.str. verstraeteni PARATYPUS Ferro", "Hydraena s.str. verstraeteni n.sp. DET FERRO 1983 Paratypus".

**Differential diagnosis:** Habitus as in Plate 5 Fig. 18. Body length: 2.4 mm (holotype). This species is characterized by the following features: body very elongate (pronotal length/elytral length = 0.3, elytral

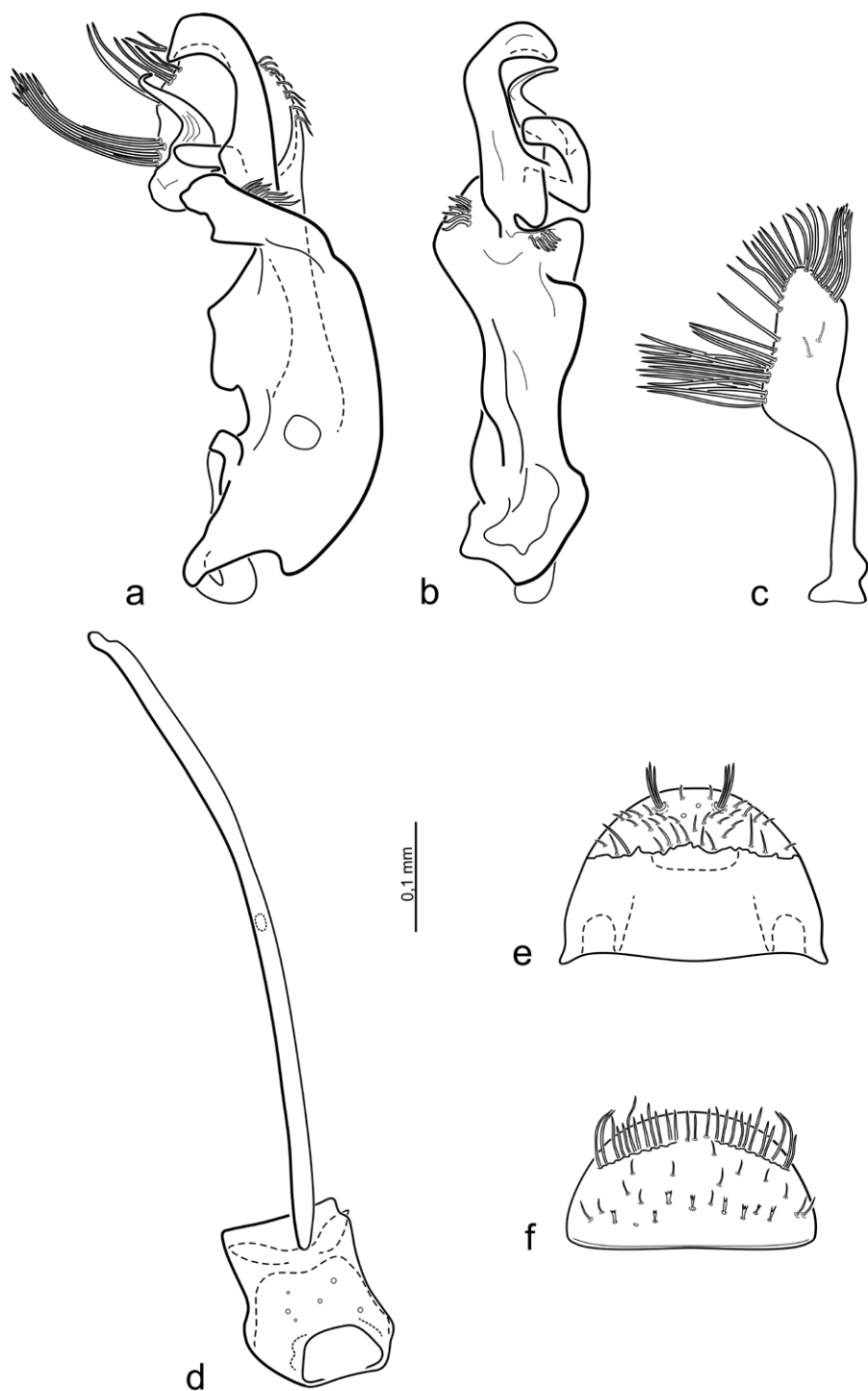


Fig. 9: *Hydraena persica*: a–b) aedeagus, lateral and dorsal view; c) right paramere, lateral view; d) male sternite X and spiculum; e) gonocoxite; f) female tergite X.

length/elytral width = 1.7); tips of palpi darkened; elytral punctures densely arranged in more or less regular lines; tibiae very thin, mesal face of male metatibia weakly expanded in apical 0.15–0.50.

Aedeagus (see JÄCH 1992: Fig. 41).

**Distribution:** Southern Iran (Hormozgan).

### *Hydraena scythica* species group

Obviously, *Hydraena pesici* (described below) is related with a number of species known from Tajikistan, Afghanistan and Pakistan: *H. ariana* Janssens, *H. cryptostoma* Jäch, *H. pakistanica* Jäch, *H. pamirica* Jäch, *H. schuelkei* Jäch, *H. scythica* Janssens, and *H. wrasei* Jäch. These species share a similar type of aedeagus, which somewhat resembles the *H. riparia* group. However, the aedeagal setation deviates from the typical pattern (3 subapical + 1 dorsal) of the *H. riparia* group. In the *H. scythica* group, which is here newly established, all setae are found in the apical area of the main piece. The number of aedeagal setae varies: two or three in *H. scythica*, three in *H. cryptostoma* and *H. pesici*, and four in the remaining species of this group.

### *Hydraena* (s.str.) *pesici* sp. n.

**Type locality:** Small rheocrenic spring (source of Mashad), Mashad, Razavi Khorasan Prov., northeastern Iran.

**Type material:** **Holotype** ♂ (NMW): “IRAN Khorasan Prov. spring near Mashad [= Mashad] town small rheocrenic spring 6.6.05, [= 2005] leg. Pesic (IR 68a)”. **Paratypes:** 4 ♂♂, 1 ♀ (CSH, NMW): same locality data as holotype.

**Description:** Habitus as in Plate 5 Fig. 19. Body length: 1.90–2.10 mm. Brown, head almost black, middle of pronotum darker brown, appendages reddish brown, tips of palpi distinctly darkened. Clypeus sparsely punctate, strongly microreticulate between punctures. Frons densely punctate, medially more or less glabrous between punctures, laterally densely microreticulate. Pronotum subcordiform to subhexagonal, wider than long; anterior margin slightly concave; posterior admedian foveae more or less distinct; middle of disc strongly punctate, interstices usually very densely microreticulate, matt, with few shiny spots.

Elytra elongate, subparallel-sided, widest behind middle; disc with rather distinct impression; shoulders prominent; elytral punctures usually round or elongate, small, very densely arranged in 15 regular lines, intervals very narrow, partly convex, smooth; interstices small, more or less smooth; explanate margin moderately wide, anteriorly distinctly serrate, posteriorly weakly serrate, not reaching apex; apices separately rounded.

Metaventral plaques long and wide, more or less parallel, without apparent sexual dimorphism.

Legs slightly sexually dimorphic.

Secondary sexual characters: Mesal face of male mesotibia with one or two short spines in apical 0.2–0.3. Apical three abdominal segments of male slightly enlarged.

Male terminal sternite and spiculum (Fig. 10b): Sternite subpentagonal; not firmly connected with spiculum.

Aedeagus (Fig. 10a): Main piece more or less straight in apical 0.6 (lateral view), dorsal margin bisinuous, with a very conspicuous preapical emargination (lateral view), with three subapical setae, two moderately long ones on right side and a rather short one dorsal of the emargination; phallobase more or less symmetrical. Distal lobe short, sinuous, not much longer than the larger subapical setae. Parameres inserted near phallobase; right paramere almost reaching apex of main piece, slender, apically not distinctly enlarged, with about 10 moderately long setae on apex and subapical ventral margin; left paramere short, reaching about 0.5 of main piece, setation similar to that of right paramere. Gonocoxite (Fig. 10c): Subquadrate, basal apophyses distinctly projecting; base of inner plate exposed, with strongly projecting basal apophyses; cavity large.

Female tergite X (Fig. 10d): Transverse, apical margin medially excised; with a fringe of subapical trichoid setae and a few longer ones laterally; disc with rather long, usually trifid, squamose setae.

**Differential diagnosis:** Externally, *Hydraena pesici* differs from all other Iranian species in the combination of the following characters: tips of palpi distinctly darkened; pronotum strongly punctate, interstices usually very small and densely microreticulate; elytral punctures very densely arranged; sexual dimorphism of legs hardly apparent.

**Distribution:** Northeastern Iran (Razavi Khorasan).

**Etymology:** Named for Vladimir Pešić (Podgorica, Montenegro), excellent specialist of water mites.



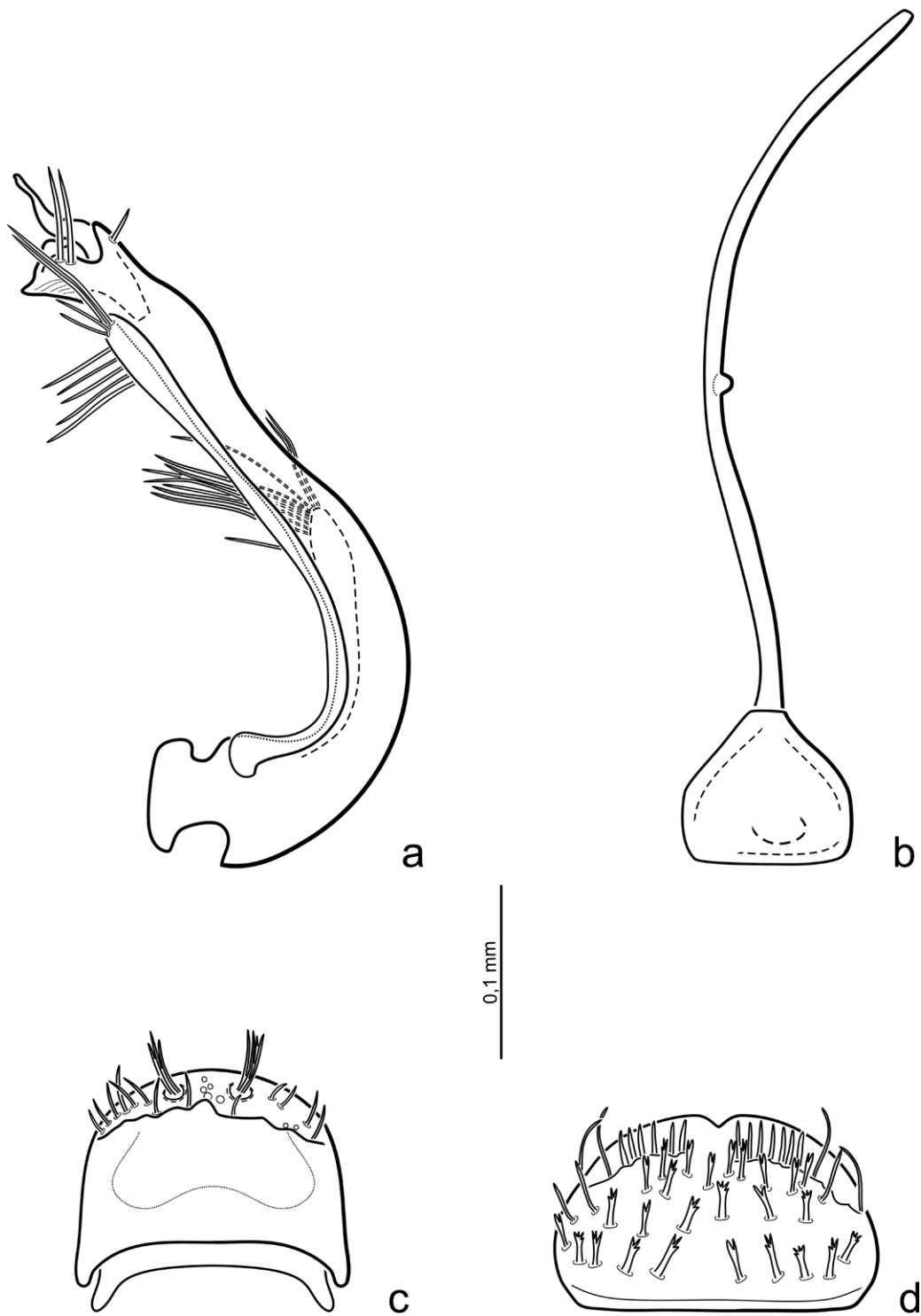


Fig. 10: *Hydraena pesici*: a) aedeagus, lateral view; b) male sternite X and spiculum; c) gonocoxite; d) female tergite X.



Fig. 11: Type locality of *Hydraena bakriensis* and habitat of *H. hajeki*. River valley near Deh Bakri, Kerman Prov., southern Iran, 1925 m (photo: J. Hájek).

### Species incertae sedis

#### *Hydraena* (s.str.) *calcarifera* Janssens, 1959

*Hydraena calcarifera* Janssens 1959: 2.

**Type locality:** Concrete pool, Abbasabad, Hamedan Prov., western Iran.

**Type material:** Not located. The holotype is not deposited in the Zoological Museum Lund (see <http://130.235.149.100:591/ZML/Insekter/Insekt.html>), where the other species, which were described together with *H. calcarifera*, are housed. And it is obviously neither deposited in the Institut royal des Sciences naturelles de Belgique, Bruxelles nor in the Université Libre de Bruxelles (P. Limbourg, email, 2.VIII.2011).

**Note:** This species was described from western Iran in a paper on Hydraenidae and Elmidae from Afghanistan! The aedeagus was damaged during preparation and thus not illustrated in the original description. JANSSENS (1959) described the aedeagus as particularly long and thin (“particulièrement long et mince”).



Fig. 12: Type locality of *Hydraena proesei* and habitat of *H. motzfeldi* and *H. janeceki*. Small stream near Ramsar, Mazandaran Prov., northern Iran, ca. 450 m (photo: A. Skale).



Fig. 13: Habitat of *Hydraena feryi*. Small stream near Qalat, Fars Prov., southern Iran, ca. 2150 m (photo: A. Skale).

The hind tibia is very significant (JANSSENS 1959: Fig. 1): curved, mesal face distinctly widened between middle and apex, with a fringe of long setae.

This species has never been collected since its description. JANSSENS (1959) placed *Hydraena calcarifera* in the *H. riparia* group. However, according to its metatibia this placement is most doubtful. It might instead be a member of the polymorphic *H. rufipes* group.

**Distribution:** Western Iran (Hamedan).

### Discussion

The genus *Hydraena* is so far recorded from only 13 of the 31 currently recognized Iranian provinces: East Azarbaijan, Fars, Gilan, Golestan, Hamedan, Hormozgan, Kerman, Kohkiluyeh & Buyer Ahmad, Mazandaran, North Khorasan, Razavi Khorasan, Tehran, Zanjan. Remarkably, no species has for instance ever been recorded from West Azarbaijan, Kermanshah and Kurdistan, three mountainous provinces that together comprise more than 90,000 km<sup>2</sup> and are supposed to be quite speciose.

Only 20 species are so far known from Iran. Further field trips will probably yield dozens of undescribed species.

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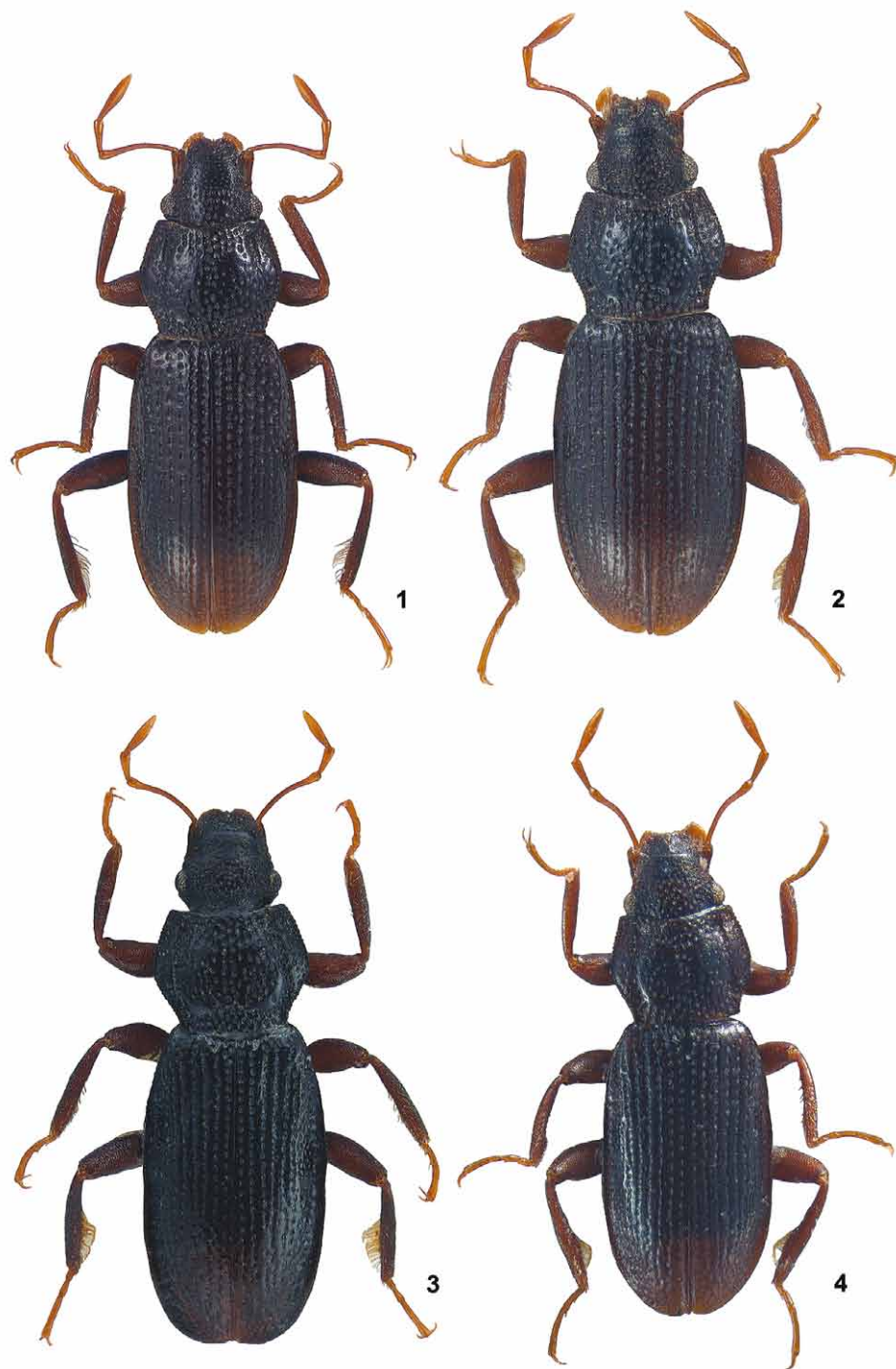


Plate 1: Habitus of *Hydraena*: 1 – *H. anatolica* Janssens, 1963 (male); 2 – *H. fontiscarsavii* Jäch, 1988 (male);  
3 – *H. hosseinteorum* Bilton & Jäch, 1998 (holotype, male); 4 – *H. khnzoriani* Janssens, 1968 (male).

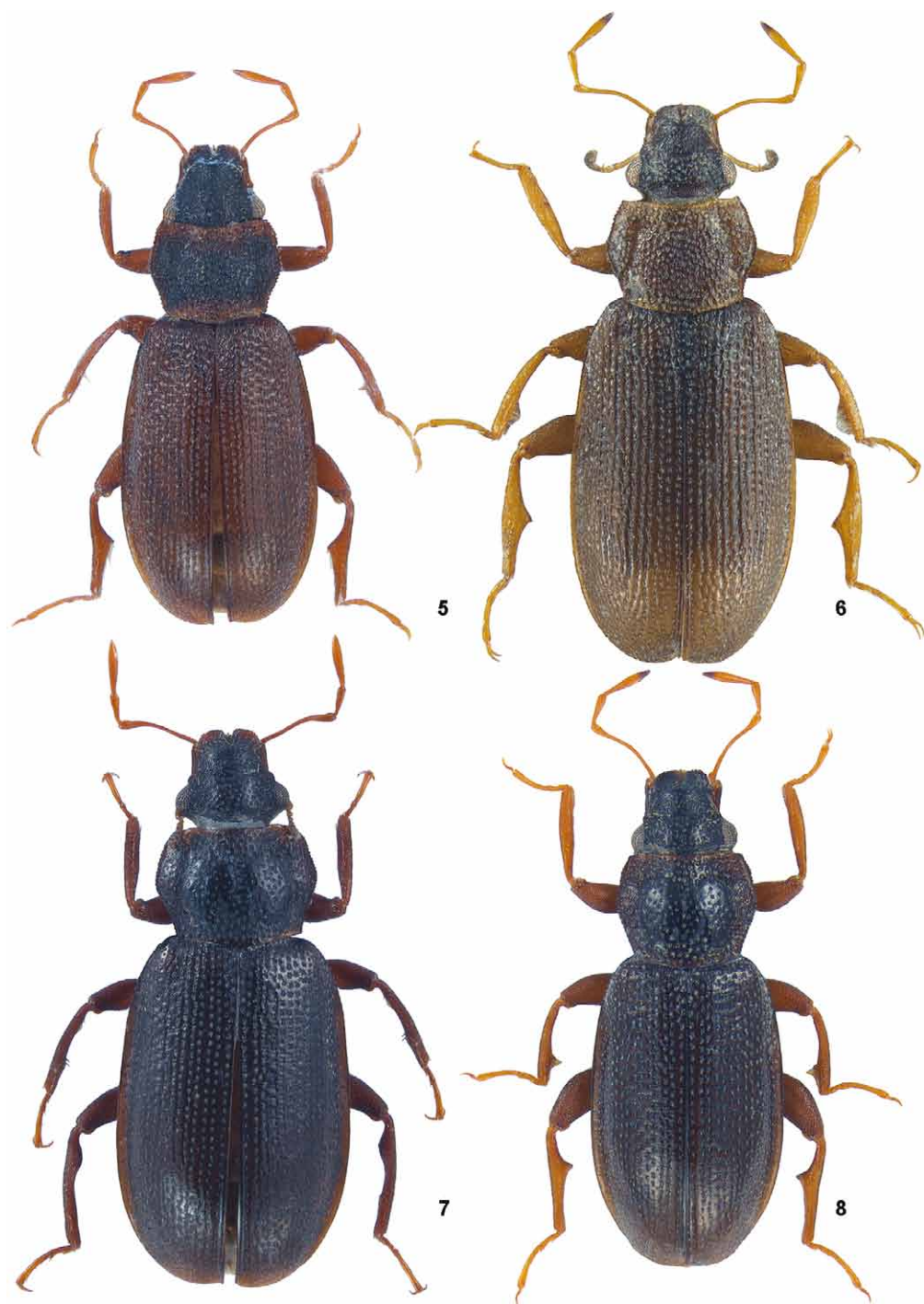


Plate 2: Habitus of *Hydraena*: **5** – *H. farsensis* sp. n. (holotype, male); **6** – *H. grandis* Reitter, 1885 (male); **7** – *H. motzfeldi* sp. n. (holotype, male); **8** – *H. proesei* sp. n. (holotype, male).

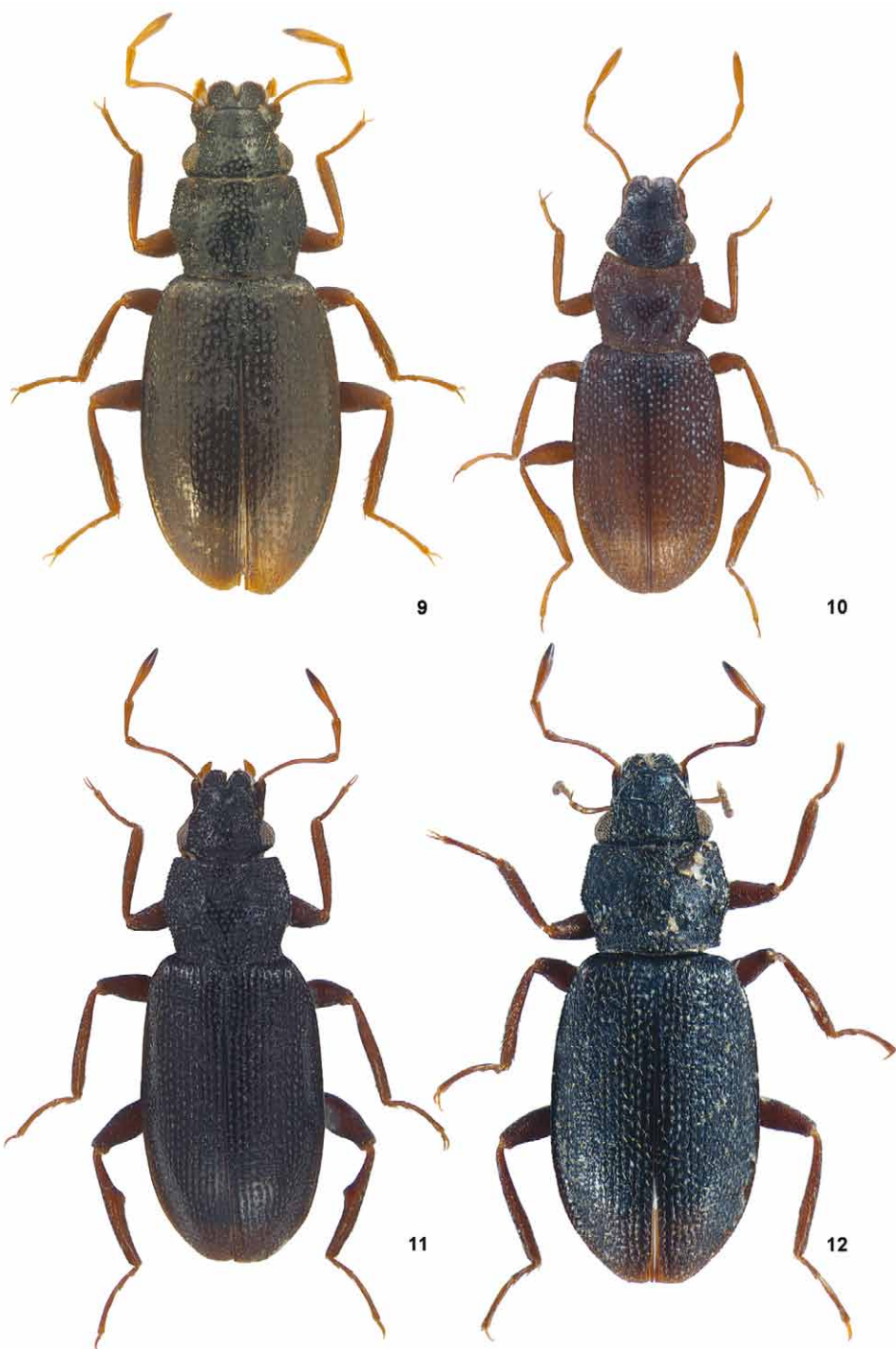


Plate 3: Habitus of *Hydraena*: **9** – *H. janeceki* sp. n. (male); **10** – *H. bakriensis* sp. n. (holotype, male); **11** – *H. feryi* sp. n. (holotype, male); **12** – *H. hajeki* sp. n. (paratype, male).



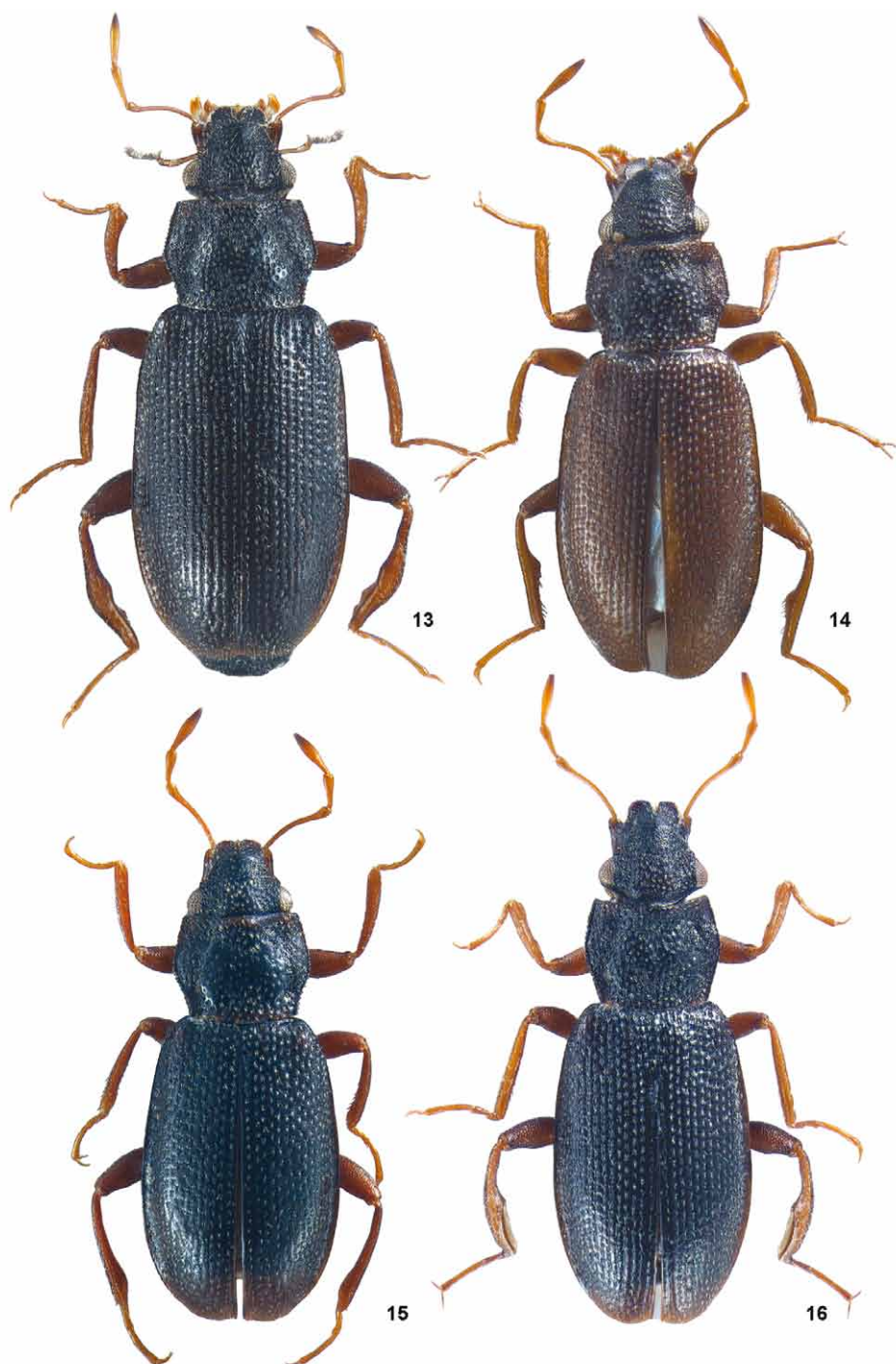


Plate 4: Habitus of *Hydraena*: **13** – *H. nurabadensis* sp. n. (paratype, male); **14** – *H. orientalis* Breit, 1916 (male);  
**15** – *H. parysatis* Janssens, 1981 (male); **16** – *H. persica* Janssens, 1981 (male).

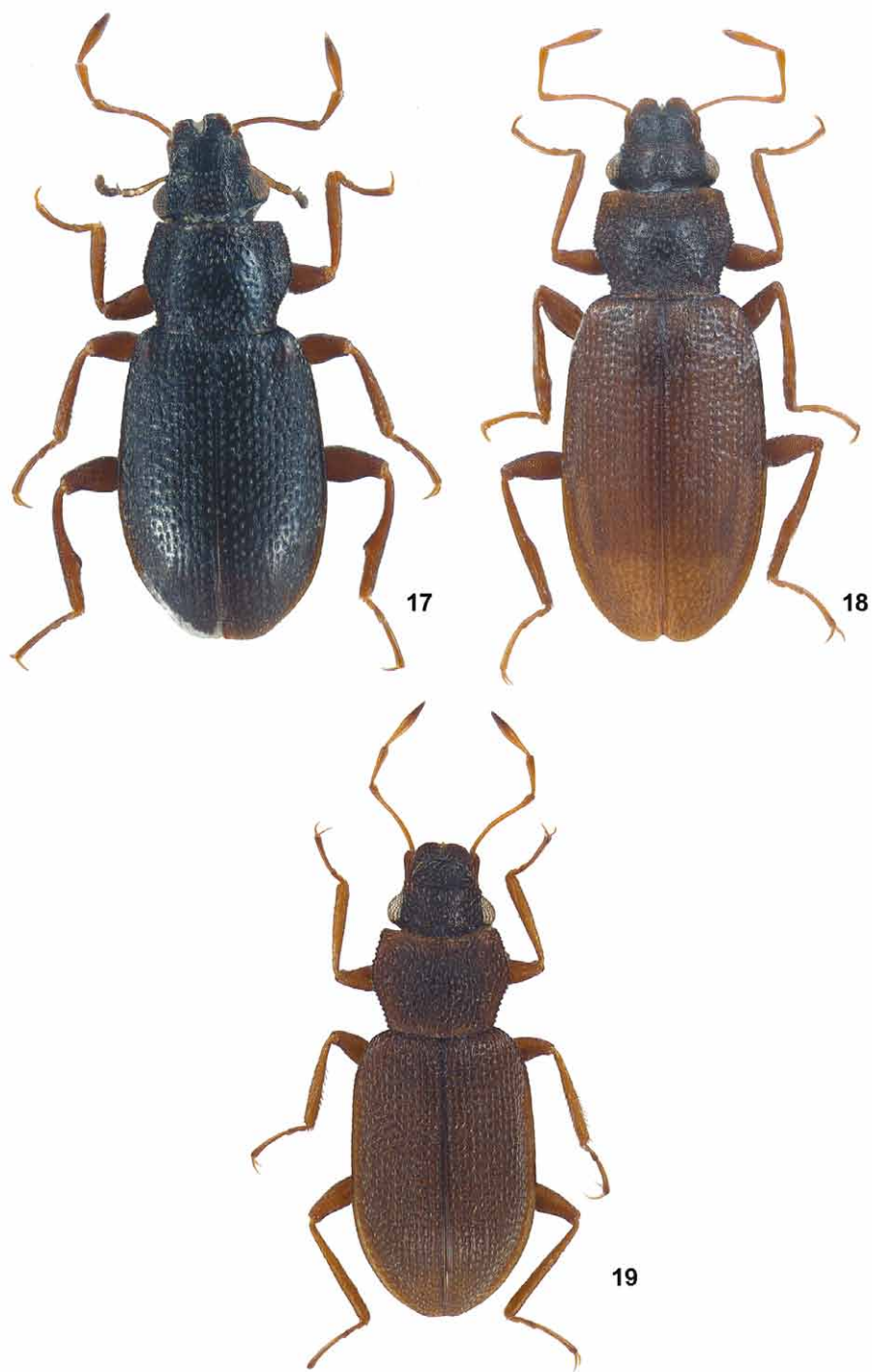


Plate 5: Habitus of *Hydraena*: 17 – *H. tauricola* Jäch, 1988 (paratype, male); 18 – *H. verstraeteni* Ferro, 1984 (holotype, male); 19 – *H. pesici* sp. n. (holotype, male).



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