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Amara (*Amara*) *elborzensis* sp. n. (Coleoptera: Carabidae) from Iran

Amara (*Amara*) *elborzensis* sp. n. (Coleoptera: Carabidae) z Íránu

Jiří HEJKAL

Wolkerova 711/48, CZ-358 01 Kraslice, Czech Republic

Taxonomy, new species, Coleoptera, Carabidae, Zabrini, *Amara*, Palaearctic region

Abstract. *Amara* (*Amara*) *elborzensis* sp. n. from Iran is described, figured, and compared with closely related species *A.* (*A.*) *ovata* (Fabricius, 1792), *A.* (*A.*) *saphyrea* Dejean, 1828, *A.* (*A.*) *similata* (Gyllenhal, 1810), and with additional related species. It belongs to the *Amara* (*A.*) *similata* species-aggregate which is here re-defined. Males in this species-aggregate are characterized by a row of setae on the inner side of the mesotibiae. *Amara* (*Amara*) *elborzensis* sp. n. is described from Caspian provinces of Mazandaran and Gilan, and from northwestern part of Khorasan province. It lives in the Talesh Mountains and on the northern slopes of the Elborz Mountains (i.e. in Hyrcanian zoogeographical subregion) in moist, deciduous forests at the altitude of ca. 300-2000 m a.s.l. It inhabits also oak forests in the neighboring mountains of the northwestern part of Khorasan province.

Nine species of the nominotypical subgenus of the genus *Amara* Bonelli, 1810 are known from Iran. Lindroth (1945) listed from Iran *A. famelica* Zimmermann, 1832, *A. lucida* (Duftschmid, 1812), *A. lunicollis* Schiödte, 1837, and *A. ovata* (Fabricius, 1792). Hieke (1981a) identified carabids of the genus *Amara*, collected during the Czechoslovak-Iranian expeditions to Iran in the years 1970 and 1973, listing the following species: *A. ovata* (Fabricius, 1792), *A. aenea* (Degeer, 1774), and *A. familiaris* (Duftschmid, 1812). The latter author mentioned the occurrence of *A. bamidunyae* Bates, 1878 in Iran (Hieke 1981b) or in the mountains of northern Iran (Hieke 1995). Hieke & Wrase (1988) cited some of Lindroth's (1945) data, adding to the list of Iranian species *A. littorea* Thomson, 1857, and *A. proxima* Putzeys, 1866. Additional Iranian species of the nominotypical subgenus of the genus *Amara* closely related to *A. ovata,* and recently distinguished, is described below. Also, another species of the subgenus *Amara* is recorded from Iran for the first time in this paper.

Amara (*Amara*) *elborzensis* sp. n.

(Figs 1, 2, 5, 6, 11, 13, 14)

Type material. Holotype: ♂, labelled "Iran, NE Mazandarán, NAHÁR KHORÁN, 36.45 N / 4.28 E, (6 km S Gorgán), 8.-25.iv.1999, J. Kaláb leg.", northern slopes of the Elborz Mountains, moist and shadowy deciduous forest, ca. 500 m a.s.l. (J. Kaláb, pers. comm.), coll. J. Hejkal. Paratypes: Nos 1-3, 1 ♂, 2 ♀♀, same data as for the holotype, coll. J. Hejkal; Nos 4-5, 1 ♂, 1 ♀, teneral specimens, labelled "Iran, NW Mazandarán, JAVÁHER DEH, leafy forest, 36.52 N / 50.28 E, 7.-8.viii.1999, J. Kaláb leg.", northern slopes of the Elborz Mountains, moist deciduous forest, ca. 1000-1500 m a.s.l. (J. Kaláb, pers. comm.), coll. J. Hejkal; No 6, 1 ♀, labelled "N Iran, W Elburz, Kalardasht pl. NE Rudbarak, 1350 m, 12.8.70, Loc. no. 90, Exp. Nat. Mus. Praha" and "Amara (s. str.) ovata F., det. Hieke 1972", Mazandaran province, coll. National Museum, Praha; Nos 7-11, 3 ♂♂, 2 ♀♀, labelled "Mazanderan (Iran), 30 km s.ö. Behshar, Wälder, 400 m,

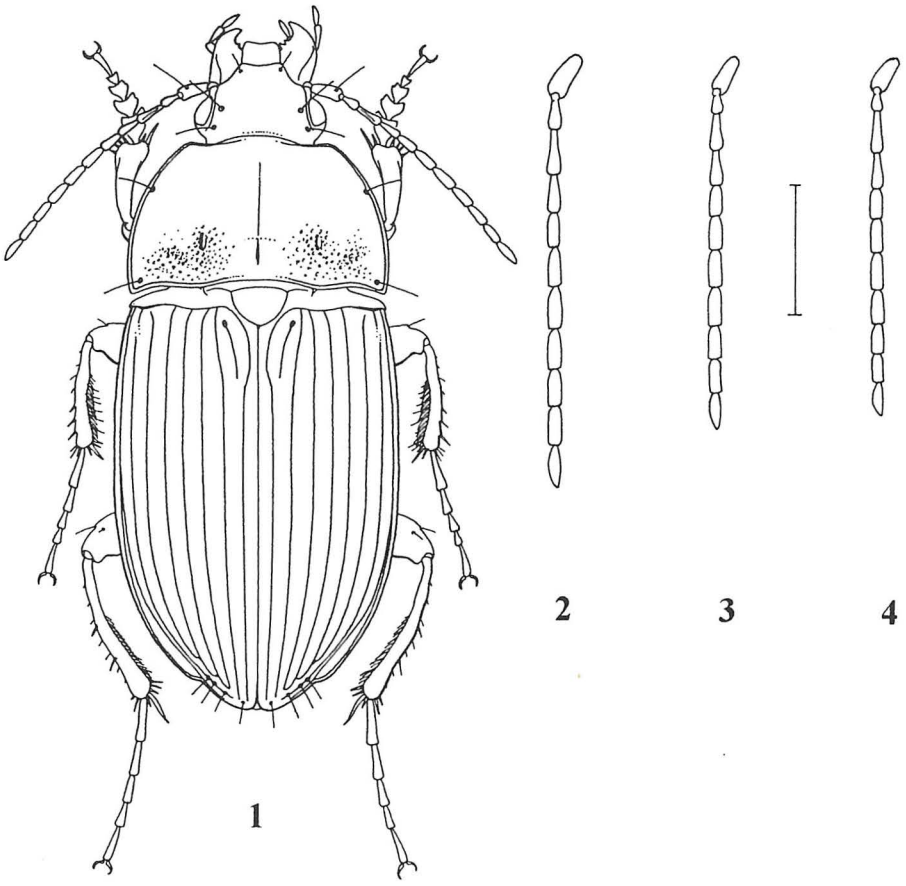
9.VIII.67, Heinz leg." and No 7 labelled "similata Gyll., Heinz det. 72", coll. W. Heinz and coll. J. Hejkal; No 12, 1 ♂, labelled "IR(Mazanderan), Wald ca. 10 km nw. Kelardasht, (Makarud), ca. 1100 m, 12/13.VI.98, Heinz leg." and "Amara (s. str.) ovata F., det. F. Hieke 1999", coll. W. Heinz; No 13, 1 ♂, labelled "Iran sept., Mazendaran, Galandrud, s. Alamdeh, ca. 300 m, 7.IV.1996, Heinz leg." and "Amara (s. str.) ovata F., det. F. Hieke 1997", coll. W. Heinz; No 14, 1 ♂, labelled "Iran, Assalam-Hero-abad, 1800/2350 m, II.5.1970, Wittmer, v. Bothmer, 1970 Freiwill. Museumsverein" and "Amara (s. str.) similata Gyll., det. F. Hieke 1973", Gilan province, coll. W. Heinz; No 15, 1 ♀, labelled "IR (Mazanderan), zw. Chorteh u. Rämsar, 900 m, 10/12.VI.1998, Heinz leg." and "Amara (s. str.) ovata F., det. F. Hieke 1999", coll. W. Heinz; No 16, 1 ♀, labelled "IR (Mazanderan), Kelerd, ca. 20 km s. Amol, 300 m, 29.III./7.IV.96, Heinz leg." and "Amara (s. str.) ovata F., det. F. Hieke 1996", coll. W. Heinz; No 17, 1 ♂, labelled "IR (Gilan), Masuleh, ca. 1400 m, 13.IV.1996, Heinz leg." and "Amara (s. str.) ovata F., det. F. Hieke 1997", coll. W. Heinz; Nos 18-22, 3 ♂♂, 2 ♀♀, same data as for the holotype, but 28.iv.2000, coll. J. Hejkal and coll. J. Kaláb; No 23, 1 ♀, teneral specimen, labelled "Iran: Gilan, Lunak, S Langrud, ca. 400 m, 12/20.VII.1999, Heinz leg.", coll. W. Heinz; Nos 24-26, 1 ♂, 2 ♀♀, Nos 24-25, teneral specimens, labelled "IRAN (Khorasan), Lowe, ne. Minudasht, ca. 700 m, 25/28.VII.1999, Heinz leg.", oak forest (W. Heinz, pers. comm.), coll. W. Heinz and coll. J. Hejkal.

Description. Macropterous species related to *Amara* (*Amara*) *ovata* (Fabricius, 1792) with relatively large and elongate body (Fig. 1). Length from anterior margin of labrum to elytral apices 8.7-10.1 mm (holotype 10.1 mm, average of 27 specimens 9.3 mm). Dorsal side black with dark metallic green lustre (paratype No 12 black, bluish to violetish, shiny). Head, pronotum and male elytra shiny, female elytra dull. Ventral side dark brown. Antennae black-brown, antennomeres 1-3 and basal third of antennomere 4 pale red-brown. Femora dark brown, tibiae dark brown to brown (holotype), tarsi brown to dark brown, bases of tarsomeres in some specimens pale brown.

Head smooth, with very slightly convex eyes. Anterior margin of labrum with 6 setiferous punctures. Anterior part of clypeus without callus or with only suggested convexity. Frontal furrows shallow, in some specimens almost absent. Antennae long (Fig. 2), surpassing posterior margin of pronotum. Mentum with bifid median tooth.

Pronotum very variable, widest at posterior third to sixth (holotype at fourth), at basal half dilated, parallel or narrowed. Width of pronotum intermediate between values in *A. ovata* and *A. similata*. Anterior margin of pronotum very deeply emarginate, anterior angles acute. Posterior angles acute, usually markedly protruding, pronotal base arcuately sinuate toward posterior angles. Inner basal impression shallow and wide, with short longitudinal median groove. Outer basal impression shallow or absent. Pronotal base around inner impression mostly densely punctate or around both impressions densely punctate (holotype) or around inner impression in some specimens sparsely punctate. Setiferous puncture at pronotal posterior angle touching widened lateral bead posteriorly.

Elytra large, broad and elongate, declivity of elytra before apex steep (lateral view). Striae conspicuously distinct, moderately deepened at anterior part, strongly deepened and widened apicad, impunctate. Row of setiferous punctures in stria 8 not interrupted. Stria 7 with three distinct setiferous punctures before apex, apical part of interval 2 mostly with additional setiferous puncture 4. Scutellar stria continuous, in some specimens interrupted at posterior part, not touching stria 1. Scutellar setiferous puncture present. Basal margination slightly arcuate to almost straight. Humeral tooth distinct. Microsculpture of regular meshes, coarser in females.

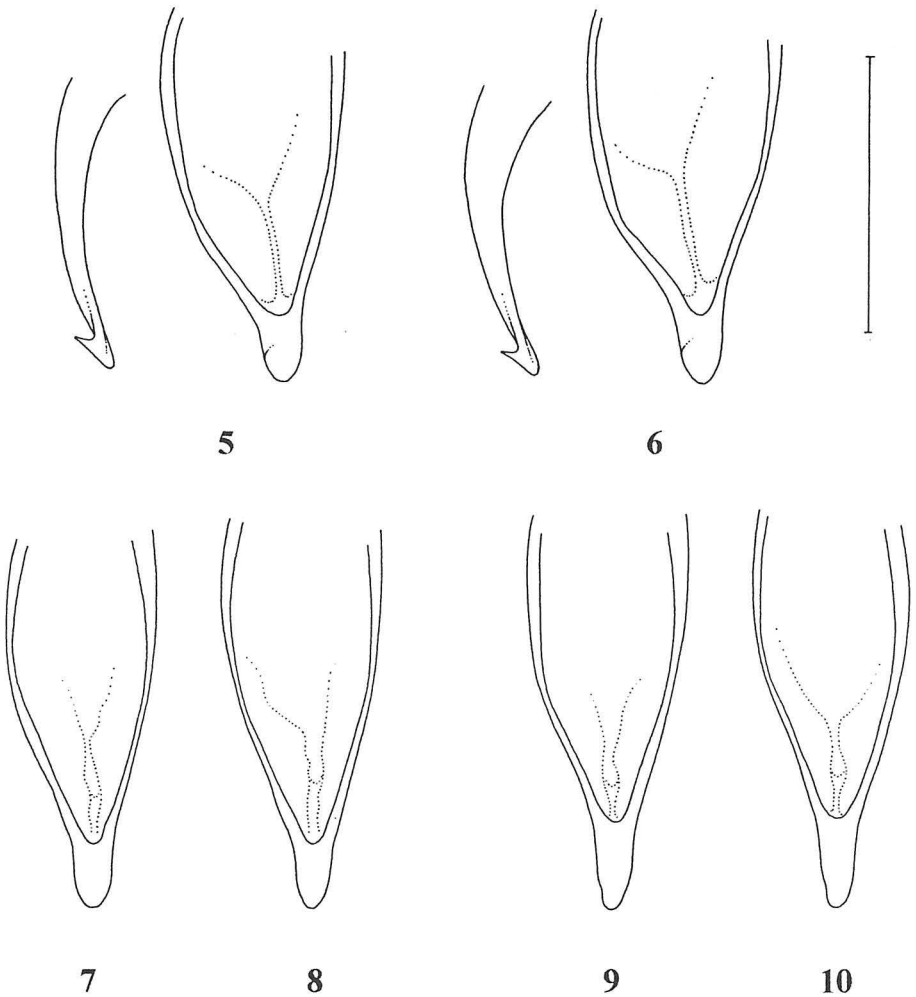


Figs 1-4: *Amara* spp. 1: habitus, dorsal view; 2-4: left antenna. 1, 2: *A. elborzensis* sp. n. (1: holotype, male, body length 10.1 mm; 2: paratype No 1, male, body length 9.6 mm). 3: *A. ovata* (Fabricius, 1792), male, body length 9.6 mm, Bohemia. 4: *A. similata* (Gyllenhal, 1810), male, body length 9.3 mm, northern Turkey. Scale: Fig. 1 not to scale; 1 mm for Figs 2-4.
Obr. 1-4: *Amara* spp. 1: habitus, dorsální pohled; 2-4: levé tykadlo. 1, 2: *A. elborzensis* sp. n. (1: holotypus, samec, délka těla 10,1 mm; 2: paratypus č. 1, samec, délka těla 9,6 mm). 3: *A. ovata* (Fabricius, 1792), samec, délka těla 9,6 mm, Čechy. 4: *A. similata* (Gyllenhal, 1810), samec, délka těla 9,3 mm, severní Turecko. Měřítka: obr. 1 bez měřítka; 1 mm pro obr. 2-4.

Episternum of prothorax sparsely and finely to very finely (holotype) punctate. Episternum of mesothorax sparsely and coarsely punctate. Episternum of metathorax sparsely and coarsely punctate, longer than wide. Sides of abdominal ventrites 1 and 2 sparsely and coarsely punctate, sides of ventrites 3 to 6 almost smooth. Abdominal ventrites 1 to 5 with one pair of setiferous punctures. Males with two to four (holotype), females with four setiferous punctures apically at last abdominal ventrite.

Inner side of male meso- and metatibiae with dense row of setae (posterior 2/3 of mesotibia length and posterior 1/2 to 3/5 of metatibia length) and sparse row of spines (almost all length of mesotibia and posterior 3/5 to 4/5 of metatibia length).

Aedeagus large and broad (Figs 5, 6). Apex of median lobe elongate and broad above, median lobe markedly dilated to left and elevated on left side. Right paramere with broad apex and long hook (Figs 5, 6). Internal sac of median lobe without sclerotized, but with specific structures (Fig. 11). Styli tongue-shaped, relatively small and short in comparison with *A. ovata*, with long lateral spurs (Figs 13, 14).



Figs 5-10: *Amara* spp. 5, 6: aedeagus: right paramere and median lobe (dorsal view); 7-10: aedeagus: median lobe (dorsal view). 5, 6: *A. elborzensis* sp. n. (5: paratype No 1; 6: holotype). 7, 8: *A. ovata* (Fabricius, 1792) (7: northern Turkey; 8: the Tian Shan Mts.). 9, 10: *A. similata* (Gyllenhal, 1810) (9: Morocco; 10: northern Turkey). Scale: 1 mm for Figs 5-10.
Obr. 5-10: *Amara* spp. 5, 6: aedeagus: pravá paramera a penis (dorsální pohled); 7-10: aedeagus: penis (dorsální pohled). 5, 6: *A. elborzensis* sp. n. (5: paratypus č. 1; 6: holotypus). 7, 8: *A. ovata* (Fabricius, 1792) (7: severní Turecko; 8: Ťan-Šan). 9, 10: *A. similata* (Gyllenhal, 1810) (9: Maroko; 10: severní Turecko). Měřítka: 1 mm pro obr. 5-10.

Differential diagnosis. *Amara* (*Amara*) *elborzensis* sp. n. belongs to the *Amara* (*Amara*) *similata* species-aggregate, in which species are characterized by acute anterior angles of pronotum, striae deepened toward the end of the elytra, and the presence of the scutellar setiferous puncture (Hieke 1975). Other characters typical for this species-aggregate are: antennomeres 1-3 being pale red-brown in color, setiferous puncture at pronotal posterior edge touching widened lateral bead, and the presence of a row of setae on the inner side of the mesotibiae of males. The latter character, unique for the genus *Amara*, is most developed and most apparent in *A. elborzensis* sp. n. This species-aggregate includes *A. chalcites* Dejean, 1828, *A. elborzensis* sp. n., *A. ovata* (Fabricius, 1792), *A. saphyrea* Dejean, 1828, *A. similata* (Gyllenhal, 1810), and *A. subconvexa* Putzeys, 1865. My material is insufficient for resolving the question, whether the following three species from East Asia, treated as members of the *A.* (*A.*) *similata* species-aggregate by Hieke (1975), belong to this species-aggregate or not: *A. congrua* Morawitz, 1862, *A. nila* Andrewes, 1924, and *A. silvestrii* Baliani, 1936.

Some individuals of *Amara elborzensis* sp. n. were formerly identified as *A. ovata* or as *A. similata* (see chapter "Type material").

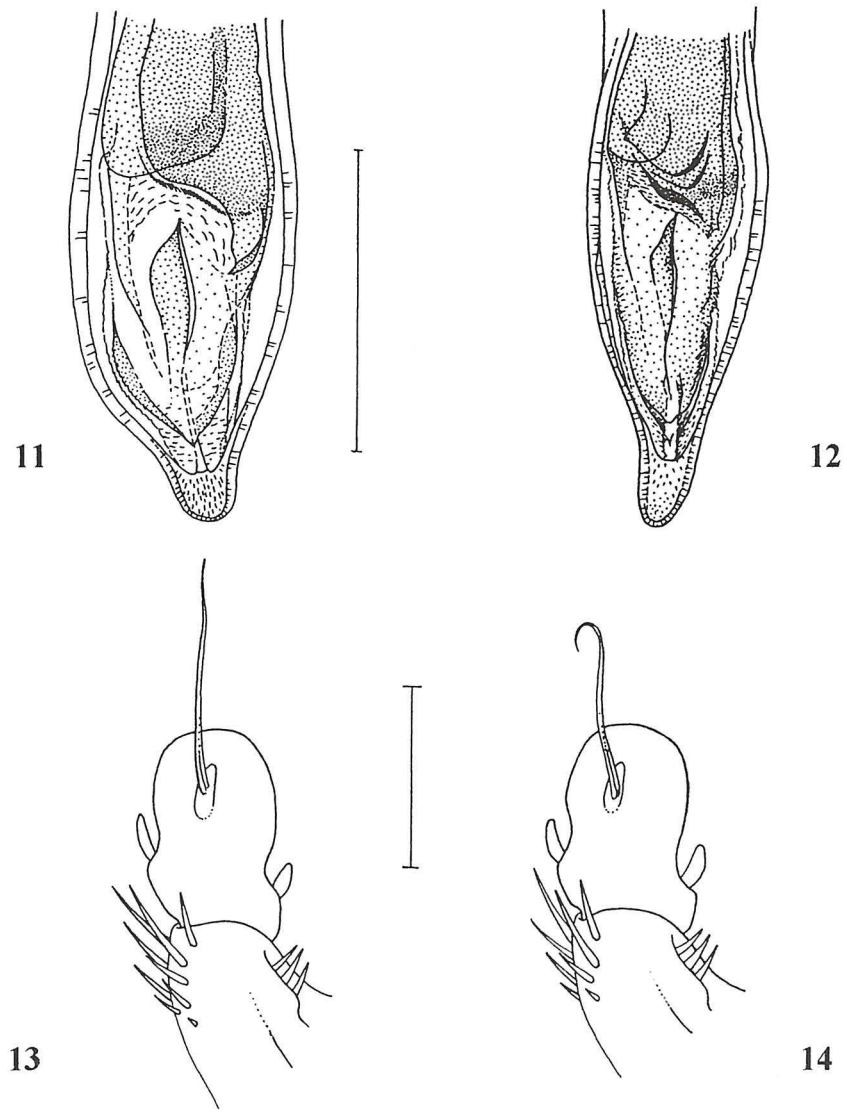
Amara elborzensis sp. n. is most closely related to *A. ovata*, with which it shares a number of characters (appearance, dark body coloration, dark legs, dull elytra in females, similarly shaped aedeagus). *A. ovata* differs especially in the shape of the pronotum, extent of its punctation, extent of setae on the mesotibiae of males, in the shape and inner structure of aedeagus, and usually also in having shorter antennae (Fig. 3). Pronotum of *A. ovata* is broader, usually broadest just before its basis, and more narrowed toward its anterior margin. Posterior angles of the pronotum are less elongated in this species. Pronotal base is usually not punctate, or very sparsely punctate (with the exception of some specimens from Sichuan). Setae on the inner side of the mesotibiae of males are shorter and thinner than in *A. elborzensis* sp. n., reaching usually only till the half of the tibia. Median lobe of aedeagus, and its apex (Figs 7, 8) are markedly narrower in *A. ovata*, and also the internal sac is differently shaped (Fig. 12). Styli are probably larger and longer in this species. *A. ovata* is smaller in mean (8.7 mm), and its coloration is more variable (mostly dark metallic brown, upper surface of the specimens from Turkey and Caucasus being usually blue-green to green-blue in color).

A. elborzensis sp. n. agrees with *A. saphyrea* in the extent of the setae on the mesotibiae of males, and in some cases also in the shape of pronotum. However, the upper surface of the latter species is usually lighter, blue or green-blue, femora and tibiae, incl. setae, are light reddish brown, and the shape of aedeagus is very different.

A. similata is another closely related species, with markedly punctate pronotal base, similar to that in *A. elborzensis* sp. n. *A. similata* differs in having pronotum and elytra narrower, and in being smaller in mean (8.7 mm). Its upper surface is usually lighter than in *A. elborzensis* sp. n., being usually brown-green. Setae on the inner side of the mesotibiae of males are reaching usually only till the half of the tibia in *A. similata*. Lenght of antennae (Fig. 4), shape of pronotum, which is broadest just before its base, and shape of aedeagus (Figs 9, 10) are also different.

The remaining related species differ especially in the following characters: *A. chalcites* in the shape of the pronotum (pronotum of *A. chalcites* is more narrowed toward its anterior end), in having dorsal side and tibiae paler (tibiae of *A. chalcites* are pale red-brown to pale brown), and in the shape of aedeagus (aedeagus of *A. chalcites* is narrower and shorter); *A. congrua* in having pronotum more convex, elytra more shiny in females, and elytra shorter; *A. nila* in having elytra more shiny in females, and dorsal side paler, blue or green; *A. silvestrii* in having dorsal side and

tibiae paler (tibiae of *A. silvestrii* are pale red-brown), elytra of females more shiny, and pronotum more convex; *A. subconvexa* in being smaller (mostly 7-8 mm), in having elytra shorter, and elytra of females more shiny.



Figs 11-14: *Amara* spp. 11, 12: aedeagus: internal sac of median lobe, dorsal view; 13, 14: styli, ventral view. 11, 13, 14: *A. elborzensis* sp. n. (11: holotype; 13: paratype No 21; 14: paratype No 22). 12: *A. ovata* (Fabricius, 1792), northern Turkey. Scale: 1 mm for Figs 11, 12; 0.5 mm for Figs 13, 14.

Obr. 11-14: *Amara* spp. 11, 12: aedeagus: vnitřní vak penisu, dorsální pohled; 13, 14: styly, ventrální pohled. 11, 13, 14: *A. elborzensis* sp. n. (11: holotypus; 13: paratypus č. 21; 14: paratypus č. 22). 12: *A. ovata* (Fabricius, 1792), severní Turecko. Měřítka: 1 mm pro obr. 11, 12; 0,5 mm pro obr. 13, 14.

Distribution and chorology. *A. elborzensis* sp. n. was found in northern Iran. It inhabits Caspian provinces of Mazandaran and Gilan, and northwestern part of Khorasan province. It lives in the Talesh Mountains and on the northern slopes of Elborz Mountains (i.e. in Hyrcanian zoogeographical subregion), and in the neighboring mountains of the northwestern part of Khorasan province. All individuals, for which the data are available, were collected in moist deciduous forests or in oak forests at altitude of ca. 300-2000 m a.s.l. A related species, *A. ovata*, inhabits probably a more northern area (with the exception of some Chinese provinces, and of Tibet), with the southern border in central Spain, northern Greece, northern Turkey, the Caucasus and the mountains system of Transcaucasia, and the Tian Shan Mountains. The records of *A. ovata* from Iran (first published by Lindroth (1945)) probably refer to *A. elborzensis* sp. n. The paratype No 6 was originally identified as *A. ovata* (Hieke 1981a). I re-identified specimens from Afghanistan, originally identified by Jedlička (1967) as *A. ovata* and deposited in the collections of the Moravian Museum in Brno, as *A. similata*. *A. similata* has a more southern distribution than *A. ovata*, occurring e.g. in Morocco, Iran (provinces of Tehran and Gilan), Turkmenistan, Afghanistan, and Tajikistan. *A. similata* was not yet recorded from Iran. Unlike *A. elborzensis* sp. n. it shows no exact habitat preferences. The remaining related species have a very different appearance, and inhabit remote areas, such as western Mediterranean (*A. subconvexa*), southeastern Europe (*A. saphyrea*), or eastern Asia (*A. chalcites*, *A. congrua*, *A. nila*, and *A. silvestrii*).

Name derivation. The specific name is derived from the name of the mountains, in which the type locality is located (the Elborz Mountains).

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SOUHRN

V této taxonomické studii je popsán nový druh střevlíčka *Amara* (*Amara*) *elborzensis* sp. n. ze severního Íránu. Byl sbírán v kaspických provinciích Mazandaran a Gilan a v severozápadní části provincie Khorasan.

A. elborzensis sp. n. patří do druhové skupiny *Amara* (*Amara*) *similata* (jež je v této práci redefinována), ve které samci vlastní řadu chloupků na vnitřní straně středních holení. Tento znak, který je v rodu *Amara* unikátní, je u *A. elborzensis* sp. n. nejvyvinutější a nejnápadnější. Další společné znaky uvedené druhové skupiny jsou: zašpičatělé přední rohy štítu, prohloubené rýhy na konci krovek, přítomnost skutelární porojamky, světlé zbarvení tří bazálních článků tykadel a porojamka v zadním rohu štítu dotýkající se postranního vroubení štítu. Do této skupiny kromě *A. elborzensis* sp. n. patří palearktické druhy *A. ovata* (Fabricius, 1792) a *A. similata* (Gyllenhal, 1810), západomediteránní druh *A. subconvexa* Putzeys, 1865, jihovýchodoevropský druh *A. saphyrea* Dejean, 1828 a východoasijský druh *A. chalcites* Dejean, 1828. Pro nedostatek materiálu zůstává otázkou, zda do této druhové skupiny patří také další tři druhy řazené do ní Hiekem (1975), obývající východní Asii (*A. congrua* Morawitz, 1862, *A. nila* Andrewes, 1924 a *A. silvestrii* Baliani, 1936).

A. elborzensis sp. n. je blízce příbuzný druhům *A. ovata* a *A. similata*. Od *A. ovata* se liší především tvarem štítu (štít *A. elborzensis* sp. n. je užší a slaběji se zužuje dopředu) a větším rozsahem jeho tečkování, větším rozsahem chloupkování středních holení samců, tvarem a vnitřní strukturou aedeagu, větší průměrnou velikostí a relativně delšími tykadly. Od *A. similata* se liší širším štítem a širšími krovkami, větším rozsahem chloupkování středních holení samců, větší průměrnou velikostí, tmavším zbarvením, relativně delšími tykadly a tvarem aedeagu. Další příbuzný druh *A. saphyrea* je na první pohled rozeznatelný světlou barvou stehen a holení a u většiny jedinců modrou barvou vrchní části těla.

Z blízce příbuzných druhů obývá Írán *A. similata*. Tento druh byl doposud nalezen v provinciích Gilan a Tehran. Dosud publikované údaje o rozšíření *A. ovata* v Íránu se týkají (Hieke 1981a) nebo zřejmě týkají (Lindroth 1945) *A. elborzensis* sp. n.

A. elborzensis sp. n. žije v pohoří Talesh a na severních svazích pohoří Elborz (tj. v hyrkánské zoogeografické podoblasti), a také v sousedních horách severozápadní části provincie Khorasan. Všichni jedinci z kaspických provincií Mazandaran a Gilan, u kterých jsou mi známy okolnosti nálezu, byli sbíráni ve vlhkých listnatých lesích v nadmořské výšce cca 300-2000 m n.m. V provincii Khorasan byl nový druh nalezen v dubovém lese v nadmořské výšce 700 m n.m.