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Two new *Bruchus* species from the Iranian highlands, with biological data (Chrysomelidae: Bruchinae)

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Abstract. Description of two *Bruchus* species from the highlands of Western and Northern Iran: *Bruchus nikdeli* reared from *Vicia canescens* seeds, and *Bruchus barimanii* reared from *Vicia canescens variegata (= V. persica)* seeds.

Key words: entomology, taxonomy, new species, Bruchinae, *Bruchus*, Iran.

Bruchus is a medium-sized genus of Bruchinae, with 37 species (including two *incertae sedis*) recognized by Anton (2010) in the "Catalogue of Palaearctic Coleoptera". A large number of species listed as *Bruchus* in Udayagiri & Wahdi's "Catalogue of Bruchidae" (1989) have since been or should be moved to other genera, mainly to *Bruchidius* (in particular, many African *Bruchidius* species were described by Pic as *Bruchus*). In fact, no true *Bruchus* occurs outside the Palearctic region, except for a few cosmopolitan or accidentally introduced species. *Bruchus* species are well characterized by a combination of four main morphological features: sides of pronotum usually with a pair of teeth, apex of middle tibia modified in males, aedeagus straight, and presence of a specialized genital plate (eighth abdominal sternite).

After Borowiec's pioneering work (1988) on *Bruchus* species groups, a combined analysis of molecular data and shape variation of the eighth abdominal sternite was performed on 25 *Bruchus* species by Kergoat & Alvarez (2008). It showed that these species cluster into seven phylogenetic groups, namely the *affinis, atomarius, loti, rufipes, tristis, pisorum,* and *brachialis* species groups. *Bruchus* species usually feed in

Vicieae seeds (genera *Lathyrus, Vicia* and *Lens*), and their diet breadth is very narrow (Delobel & Delobel 2006). Two remarkable *Bruchus* specimens were reared from seeds of *Vicia canescens* Labill. collected on the slopes of Mt. Sahand in the vicinity of Maraghe, Azarbaijan province. A second species was reared from *Vicia persica* Boiss., which is usually considered to be a synonym of *Vicia canescens* Labill. subsp. *variegata (*Willd.)P.H.Davis (Davis 1970, Pakravan 2000). Infested seeds were collected in the Alborz mountain range near the village of Poloor (or Polur), Mazandaran province. Both seed beetles are new to Science, and are described hereafter.

***Bruchus nikdeli* sp. nov.**

Type material

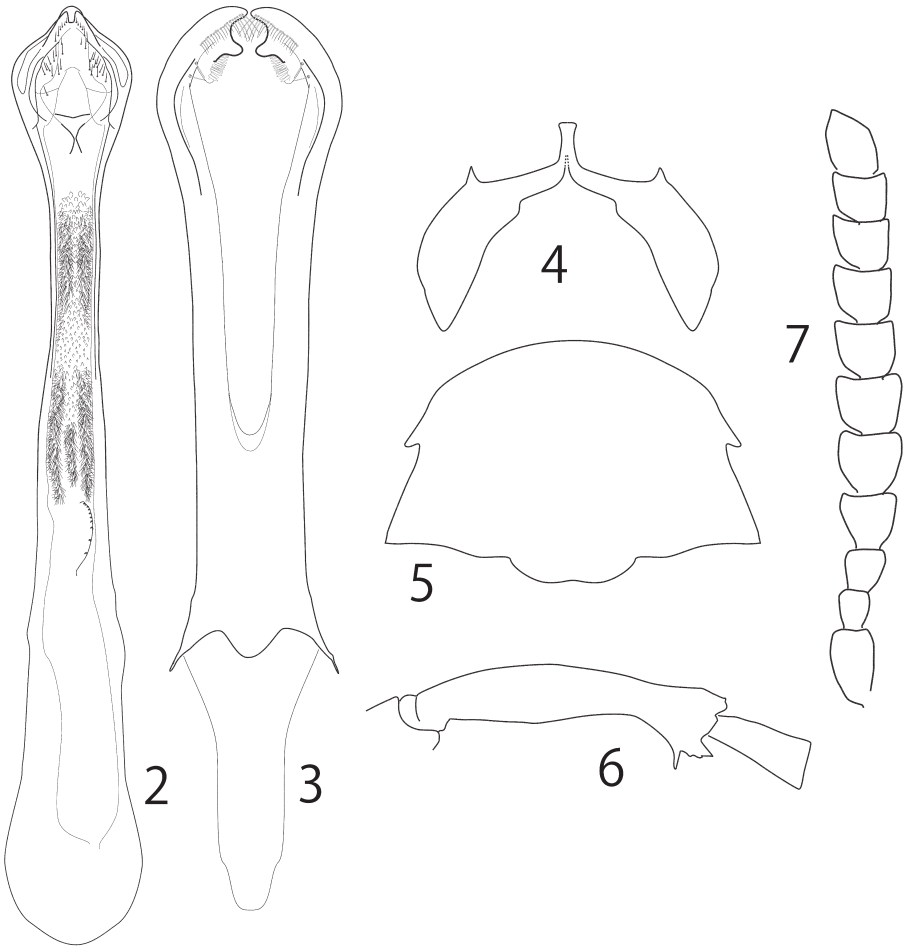
Holotype: Male, "IRAN, Azarbaijan, Maraghe-Sahand, 19.vi.2011, ex *Vicia canescens*, M. Nikdel coll." "*Bruchus nikdeli* n.sp., Delobel & Sadhegi des. 2013", dissected (Delobel 02413), MNHN. Paratype, male, same data as holotype, dissected (Delobel 02513), MNHN.

1. Male of *Bruchus nikdeli*, habitus

Description

Length: 2.2 (PT)- 4.1 (HT) mm; width: 1.1(PT)- 2.3 (HT) mm.

Body (Fig. 1) black, except three basal antennal segments, fore legs from middle of femur, mesotarsi and very briefly mesotibial apex, reddish-orange. Dorsal vestiture thin and long, dense to very dense, yellowish grey to light olive; postocular lobes and a circular spot on temple with dense white setae; elytra with whitish (white in holotype) elongated spot on interval 5, interrupted by two black spots, and apex of intervals 3, 5-7, and 9; dark (black in holotype) rounded spot beyond middle of elytral side, surrounded by whitish or white setation, rest of elytral apex dark or black; pygidium yellowish-grey, with a pair of large lateral, ill-defined dark spots; ventral vestiture thin, light greyish to white.



2-4. Male of *Bruchus nikdeli*: 2 – median lobe; 3 – lateral lobes and tegminal strut; 4 – eighth ventrite; 5 – pronotum; 6 – mesotibia; 7 – antenna

Male. Head short, eyes moderately bulging, separated by 0.24 times head width including eyes; face wide, distance between posterior rim of eyes and apex of clypeus / distance between eyes = 3.1; ocular sinus two thirds length of eye, width at bottom of sinus composed of 8 ommatidia; frontal carina absent. Punctation of face very dense, small, rugose, apex of clypeus straight. Antenna (Fig. 7) measuring 0.4 times body length; antennal segments 1-3 submoniliform, 4 subtriangular, 5-10 subserrate, slightly wider than long, 11 apically pointed (L/W = 1.7). Length of antennomeres: 1.8: 1; 1.1; 1.4; 1.5; 1.4; 1.4; 1.3; 1.3; 1.2; 1.9.

Pronotum (Fig. 5) moderately transverse (W/L = 1.55), broadly semicircular, lateral tooth near middle, well developed, sticking backwards; cervical sulcus visible only laterally; basal lobe sulcate, oblique impression on sides of basal lobe. Disc convex, shining with very dense punctuation, partly foveolate and coalescent. Elytra distinctly wider than pronotal base, 1.2 times longer than combined width, their sides convex, maximum width beyond middle; no teeth at base of striae; humeral callus moderate; striae on disc thin and sharp; interstriae flat, with thin puncation on alutaceous background.

Mesofemur broadened, mesotibia (Fig. 6) short, arcuate and bisinuate on mesal side, widened apically into a bifid plate, distal point a strong hook pointing distally, recess between denticles about as large as maximum width of first mesotarsal segment. Hind femur moderately incrassated; mesoventral margin with well-defined preapical notch; apex of hind tibia with mucro much longer than lateral and dorsal denticles, measuring about 0.4 apical width of tibia.

Abdomen with ventrite 5 emarginated. Last visible abdominal tergite shield-shaped, slightly longer than wide at base, with apex convex, slightly turned under.

Genitalia: Median lobe (Fig. 2) of moderate length, slender (maximum width excluding basal hood / total length = 0.13), apically widened; basal hood hardly sclerotized, long and slender, not emarginate; ventral valve strongly sclerotized, subovate, strongly curved ventrally, with blunt apex, bearing two lateral groups of about 18 setae, 4-5 of which very small; internal sac with two distinct masses of dense spicules, separated by an almost smooth area with numerous sensillae; a curved dentate sclerite towards apex. Basal strut (Fig. 3) transparent; lateral lobes cleft to 68% their length; apex of parameres strongly bowed, highly modified, with strongly sclerotized dented plate, transparent wing and numerous setae of different types. Eighth tergite (Fig. 4) strongly sclerotized, wide, with apical margin thickened and dented.

Female. Unknown

Etymology

The species is dedicated to its first collector, Mostafa Nikdel, Agricultural and Natural Resource Center of East Azarbaijan (Iran).

Host plants

Larvae develop in the seeds of *Vicia canescens* Labillardière (Leguminoseae, Fabaceae, Vicieae), a montane species native to Western Asia (Iran, Iraq, Turkey,

Lebanon). To the best of our knowledge, no seed beetle was ever reared from *V. canescens* seeds.

Discussion

Differs from closely related *B. barimanii* in the following features: elytron with striking colour pattern, mesotibia strongly curved, with a strong hooked denticle oriented distally; antenna slightly shorter and stouter, with 6th segment 1.12 times wider than long (slightly longer than wide in *barimanii*); eighth ventrite with a single pair of teeth.

Distribution

Mountains of North Western Iran, between 2800 and 3400 m. a.s.l.

***Bruchus barimanii* sp. nov.**

Type material

Holotype: Male, "IRAN, Mazandaran, Amol, Polor, 30.vi.2010, ex *Vicia persica,* H. Barimani coll." "*Bruchus barimanii* n.sp., Delobel & Sadhegi des. 2013", MNHN. Paratypes, 3 males, 7 females, same data as holotype, two males dissected (Delobel 03613 & 03713), MNHN.

Description

Length: 4.0- 4.5 mm; width: 1.8-2.3 mm.

Body black, except two basal segments of antenna (in some specimens only one, rarely also base of third), fore legs from base or middle of femur, reddish-orange. Dorsal vestiture dense, head yellowish grey on vertex and frons, whitish on clypeus; postocular lobes and a circular spot on temple with dense white setae; pronotum yellowish to orange, with base lighter, scutellum whitish, elytra uniformly dull yellowish-orange, with slightly lighter elongated spots visible in some specimens on intervals 5 and 7; pygidium light grey, with yellowish lateral areas; ventral vestiture whitish.

Male. Head short, eyes moderately bulging, separated by 0.29 times head width including eyes; distance between posterior rim of eyes and apex of clypeus / distance between eyes = 2.3; ocular sinus three quarters length of eye, width at bottom of sinus composed of 5-6 ommatidia; frontal carina absent. Punctation of face very dense, small, rugose, apex of clypeus straight. Antenna (Fig. 13) measuring almost half body length; antennal segments 1-3 submoniliform, 4 subtriangular, 5-10 subserrate, 4-6 slightly longer than wide, 11 apically pointed (L/W = 1.7). Length of antennomeres: 1.8: 1; 1.3; 1.6; 1.9; 1.7; 1.6; 1.6; 1.5; 1.4; 2.3.

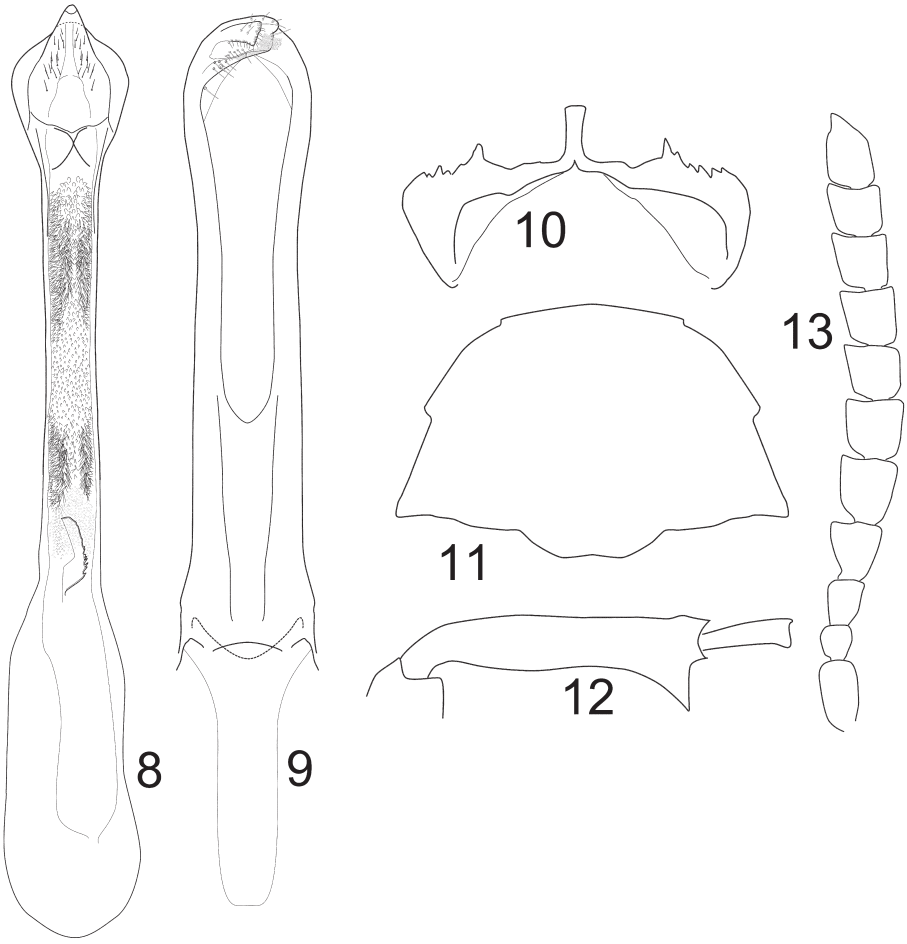
Pronotum (Fig. 11) moderately transverse (W/L = 1.57), broadly semicircular, strong lateral tooth near middle; cervical sulcus well visible laterally; basal lobe sulcate, oblique impression very faint on sides. Disc convex, shining, with very dense punctuation, partly foveolate and coalescent. Elytra distinctly wider than pronotal base, 1.1 times longer than combined width, their sides convex, maximum width at basal third; no teeth at base of striae; humeral callus moderate; striae on disc thin and sharp;

interstriae flat, with thin puncation on alutaceous background.

Mesofemur broadened, mesotibia (Fig. 12) slightly bisinuate on mesal side, widened apically into a bifid plate with distal tooth much smaller than proximal denticle, recess between them slightly wider than maximum width of first mesotarsal segment. Hind femur moderately incrassated; mesoventral margin with well-defined preapical notch; apex of hind tibia with mucro much longer than lateral and dorsal denticles, measuring about 0.3 apical width of tibia.

Abdomen with ventrite 5 emarginated. Last visible abdominal tergite shield-shaped, slightly longer than basal width, with apex stongly bulging, slightly turned under.

Genitalia: Median lobe (Fig. 8) of moderate length, slender (maximum width excluding basal hood / total length = 0.12), apically widened; basal hood hardly sclerotized, long and slender, not emarginated; ventral valve strongly sclerotized, subovate,



5-9. Male of *Bruchus barimanii*: 8 – median lobe; 9 – lateral lobes and tegminal strut; 10 – eighth ventrite; 11 – pronotum; 12 – mesotibia; 13 – antenna

recurved, with blunt apex, bearing two lateral groups of about 15 setae; internal sac with two distinct masses of dense spicules, separated by a large smooth area bearing sensillae; towards apex a curved sclerite with strong teeth in distal half only. Basal strut transparent; lateral lobes cleft to 64% their length; apex of parameres (Fig. 9) highly modified, with a strongly sclerotized plate, a transparent wing and numerous setae of different types. Eighth tergite (Fig. 10) strongly sclerotized, wide, with apical margin thickened and dented.

Female. Similar to male, usually a little larger (length = 4.5 mm, width = 2.4 mm). Ventrite 5 not emarginated, last visible tergite without apical boss, but with two wide lateral depressions in apical half, setation converging towards median longitudinal ridge.

Etymology

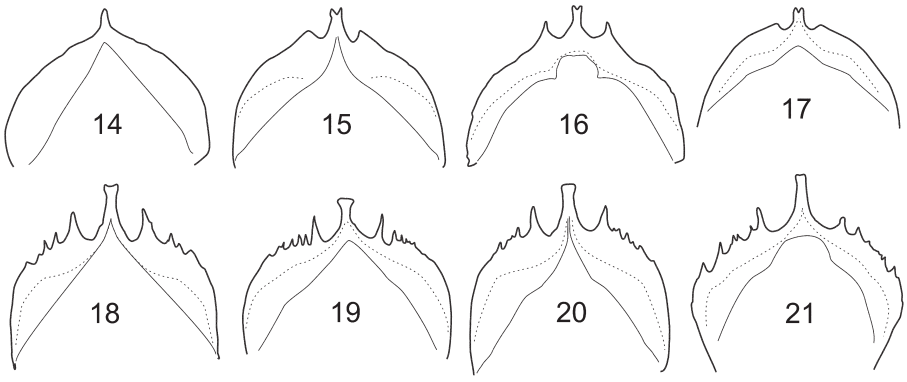
The species is dedicated to its first collector, Hassan Barimani, Agricultural and natural resource Center of Mazandaran province, Iran.

Host plants

Larvae develop in the seeds of *Vicia canescens* Labillardière subsp. *variegata (*Willd.)P.H.Davis., also known as *V. persica* Boiss.

Discussion

Specimens in this taxon could represent mere color forms of *B. nikdeli* because external differences are rather tenuous. Clear differences in genital morphology however point to the existence of a distinct species. *B. barimanii* also shows strong morphological similarities with *B. lugubris* Fähr., the type (not seen) of which is a female from Western Iran with three basal segments of antenna and apex of front tibia testaceous, rest of body and appendages being entirely black. Elytral vestiture in *B. lugubris* is a mixture of brown and white setae (Fähraeus 1839), whereas it is homogeneously yellowish in the new species.



14-21. Species-group *Bruchus rufipes*, eighth ventrite of male: 14 – *griseomaculatus*; 15 – *loti;* 16 – *rufipes*; 17 – *luteicornis*; 18 – *libanensis*; 19 – *sibiricus*; 20 – *occidentalis*; 21 – *lugubris*

Distribution

Alborz (or Elburz) mountain range, Northern Iran.

CONCLUSION

The shape of the eighth abdominal sternite in the two new species (Fig. 4 & 10), although distinct, shows some similarity with members of the *rufipes* species group, which comprises (Fig. 16-21) *Bruchus libanensis* Zampetti*, B. lugubris, B. luteicornis* Illiger, *B. occidentalis* Lukjanovitsch & Ter-Minassian*, rufipes* Herbst*, sibiricus* Germar*,* and (with doubt) *griseomaculatus* Gyllenhal (Fig. 14). *Bruchus loti* Paykull (Fig. 15) may also belong to the same group, but its status is not fully resolved (Kergoat & Alvarez 2008). Main traits supporting the placement of *nikdeli* and *barimanii* within the *rufipes* group include the following (see Borowiec 1988): pronotal teeth near middle of side, mesotibial plate ending in two sharp teeth, metatibial mucro distinctly longer than rest of coronal denticles, median lobe slender, its apex widened, internal sac with two distinct groups of dense spicules. A crescent-shaped dented sclerite is met, not only in the internal sac of members of the *rufipes* group, but in the *atomarius* group as well. It is however absent in *B. griseomaculatus*, a presumptive member of the group. It is also worth mentioning here that *B. nikdeli* and *B. barimanii*, as most members of the r*ufipes* group (Delobel & Delobel 2006), feed on *Vicia* seeds.

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