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New genera of Alleculinae (Coleoptera: Tenebrionidae: Alleculinae: Alleculini) from the Palaearctic Region. Part V - *Gammanorus* gen. nov.

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Abstract. A new genus of Alleculini Laporte, 1840 - *Gammanorus* gen. nov. with the type species *Gammanorus iranicus* sp. nov, *Gammanorus gracilis* sp. nov. from Iran and Iraq and *Gammanorus rakovici* sp. nov. both from Iran are described and illustrated. New combinations are proposed as follows: *Gammanorus evae* (Novák, 2006) comb. nov. and *Gammanorus gerdae* (Novák, 2006) comb. nov. transferred from genus *Hymenorus* Mulsant, 1852, both from Iran. New genus *Gammanorus* gen. nov. is compared with habitually similar genera known from Iran or european part of the Palaearctic Region.

INTRODUCTION

Mulsant (1852) described the Alleculine genus *Hymenorus* Mulsant, 1852 with the type species *Hymenorus doublieri* Mulsant, 1852, which is widely distributed in the Palaearctic Region (Novák, 2020a). In this genus Novák (2006) described species *Hymenorus evae* Novák, 2006 and *Hymenorus gerdae* Novák, 2006 from Iran. One species was also in this work wrongly determined as *Hymenorus indicus* Fairmaire, 1896 described from India (Himachal Pradesh). Specimens of this species are presently described in the new genus *Gammanorus iranicus* gen. and sp. nov. as the type species. Also the species *Hymenorus evae* Novák, 2006 and *Hymenorus gerdae* Novák, 2006 are transferred to the genus *Gammanorus* as *Gammanorus evae* (Novák, 2006) comb. nov. and *Gammanorus gerdae* (Novák, 2006) comb. nov.

Novák & Ghahari (2015) listed four genera in the subtribe Alleculina Laporte, 1840 (*Hymenalia* Mulsant, 1856, *Hymenorus* Mulsant, 1852, *Mycetocharina* Seidlitz, 1896 and *Prionychus* Solier, 1835) from the territory of Iran. Later Novák (2020b) added further species of different three genera (*Havanalia* Novák, 2020, *Magdanalia* Novák, 2020 and *Prionalia* Novák, 2020b) from this territory. Species of the genera *Prionychus* and *Prionalia* are very different from *Gammanorus* species. Differences between *Gammanorus* and other genera are shown in Table 1. Thus, presently we know species of seven genera of the subtribe Alleculina living in the territory of Iran. The most similar genus is *Hymenorus*, species of the new genus *Gammanorus* differ from *Hymenorus* species mainly by the shape of the body, the antenna is longer than half the body length, the pronotum is widest near the middle and the space between the eyes is approximately as wide as the diameter of one eye.
New species *Gammanorus iranicus* sp. nov., *Gammanorus gracilis* sp. nov. and *Gammanorus rakovici* sp. nov. are described, illustrated (including male genitalia) and keyed together.

MATERIAL AND METHODS

Two important morphometric characteristics used for the descriptions of species of the subfamily Alleculinae, the 'ocular index' dorsally (Campbell & Marshall 1964) and 'pronotal index' (Campbell 1965), are used in this paper as well. The ocular index equals (100 × minimum dorsal distance between eyes) / (maximum width of head across eyes). The pronotal index is calculated as (100 × length of pronotum along midline) / (width across basal angles of pronotum).

'Type material' information is taken from recent locality labels.

In the list of type material, a slash (/) separates data in separate rows, a double slash (//) separates data on different labels.

The following collection codes are used:

HNHM Hungarian Natural History Museum, Budapest, Hungary;
LPBC Luboš Purchart, private collection, Brno, Czech Republic;
VNPC Vladimír Novák, private collection, Praha, Czech Republic.

Measurements of body parts and corresponding abbreviations used in text are as follows: AL - total antennae length, BL - maximum body length, EL - maximum elytral length, EW - maximum elytral width, HL - maximum length of head (visible part), HW - maximum width of head, OI - ocular index dorsally, PI - pronotal index dorsally, PL - maximum pronotal length, PW - pronotal width at base, RLA - ratios of relative lengths of antennomeres 1-11 from base to apex (3=1.00), RL/WA - ratios of length / maximum width of antennomeres 1-11 from base to apex, RLT - ratios of relative lengths of tarsomeres 1-5 respectively 1-4 from base to apex (1=1.00).

Measurements were made with an Olympus SZ 40 stereoscopic microscope with continuous magnification and with the Soft Imaging System AnalySIS. Snapshots were taken by using camera Canon EOS 550 D and a Canon Macro Photo Lens MP-E and software Helicon Focus 7.7.5.

TAXONOMY

Genus *Gammanorus* gen. nov.

(Figs. 7-23)

Type species: *Gammanorus iranicus* sp. nov.

Description (male). Habitus as in Figs. 7, 12, 17, 22, 23, small or medium-sized, elongate, slightly oval, parallel, shiny, dorsal surface with pale setae, punctures and very fine microgranulation, widest near two thirds elytral length. Head (Figs. 8, 13, 18) through the eyes narrower than base of pronotum. Dorsal surface shiny, clypeus transverse, mandibles glabrous, shiny. Eyes large, transverse, excised, space between eyes narrow, approximately as wide as diameter of one eye. Antenna (Figs. 9, 14, 19) long, distinctly exceeding half body length. Dorsal surface with short, recumbent, pale setae and dense, small punctures and

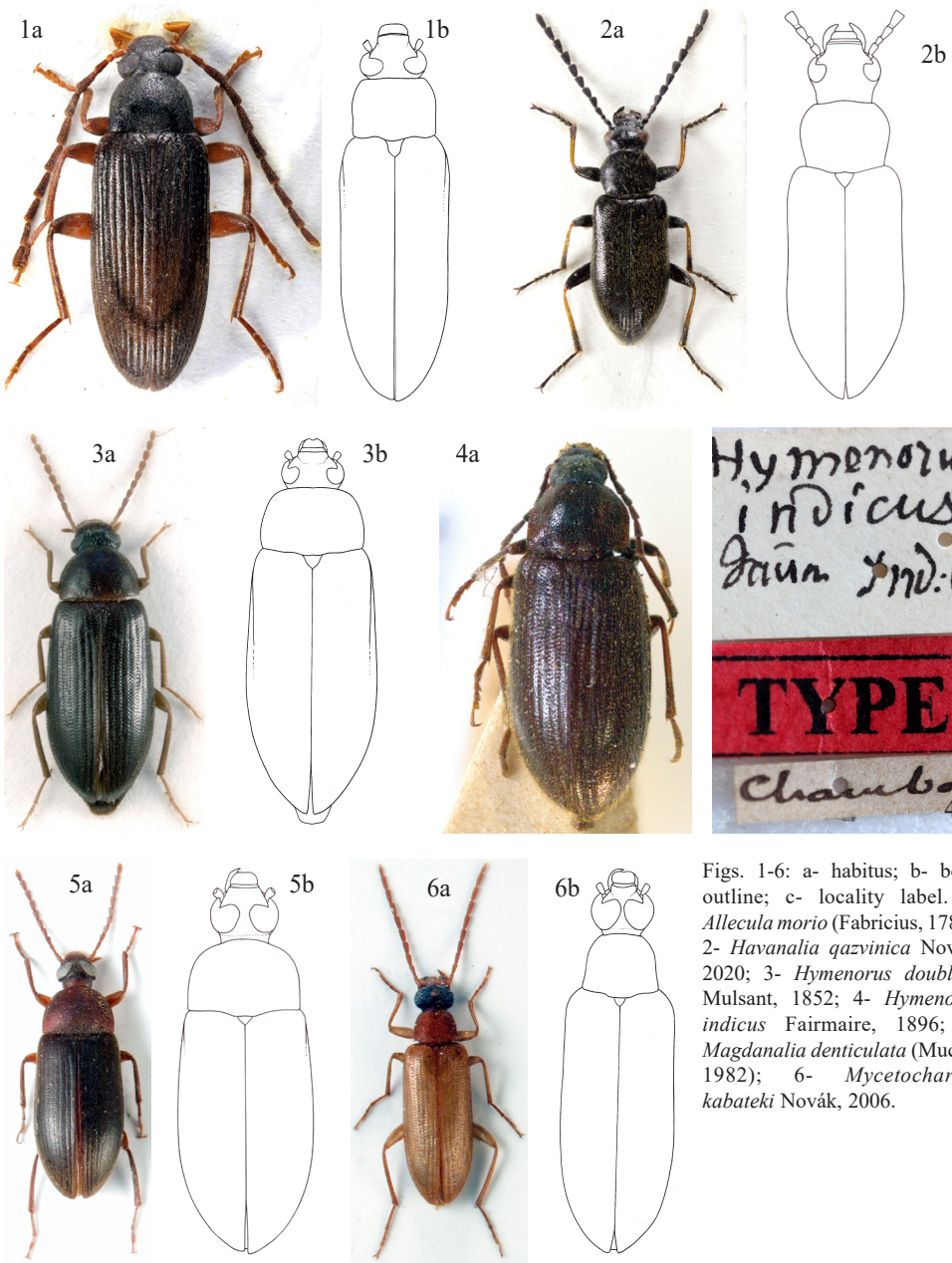
microgranulation. Antennomere 2 shortest, antennomeres 4-11 longer than antennomere 3. Ultimate maxillary palpomere widened apically, axe-shaped. Pronotum (Figs. 8, 13, 18) shiny, widest near middle of lateral margins, in base distinctly narrower than elytra at humeri. Lateral margins straight in basal half, arcuate in apical part. Border lines narrow, margins conspicuous from dorsal view. Anterior margin almost straight, base with two deep impressions between middle and posterior angles. Elytra elongate, slightly oval, shiny, widest near two thirds elytra length. Elytral striae with rows of punctures. Elytral intervals flat. Elytral epipleura well-developed. Legs long and narrow, penultimate tarsomeres slightly widened and lobed. Both protarsal claws with teeth. Aedeagus as in Figs. 10, 11, 15, 16, 20, 21.

Female. Body slightly wider than in male, space between eyes a little wider than in male.

Differential diagnosis. Species of the new genus slightly habitually resemble species of the subtribe Alleculina Laporte, 1840 genera known from Iran or the western part of the Palaearctic Region.
New species of the new genus *Gammanorus* gen. nov. distinctly differ from similar species by distinguishing characters listed in Table 1.

Table 1. Characters distinguishing *Gammanorus*.

Genus male	Body form/ ultimate maxillary palpomere	Antenna/ RLA/WA	Pronotum	Elytra	Antennomere 4-10/3	Space between eyes
Allecula Fabricius, 1801 (Figs. 1a, b)	Elongate/ shoe-shaped	Longer than half body lenght	Quadratish, shiny	Parallel, shiny	Longer	Wider than diameter of one eye
Gammanorus gen. nov. (Figs. 7-23)	Elongate, pale/axe-shaped	Longer than half body lenght	Widest near middle of lateral margine, shiny	Elongate, widest near two thirds elytra length, shiny	2.2-3.3 times longer than wide	As wide or slightly wider than diameter of one eye
Havanalia Novák, 2020 (Figs. 2a, b)	Elongate, parallel, dark/narrow elongate	Longer than half body length	Widest near middle of lateral margine, shiny	Parallel, shiny	1.7-2.1 times longer than wide	Wide (OI 50) approximately as wide as half width through the eyes
Hymenorus Mulsant, 1852 (Figs. 3a, b, 4a, c)	Elongate, oval/ axe shaped	Short	Semi circular, shiny	More flat, elongate oval, shiny	Shorter	Wider than diameter of one eye
Magdanalia Novák, 2020 (Figs. 5a, b)	Elongate oval/ axe-shaped	Short	Semi circular, matte	Elongate oval, matte	Shorter or as long	Narrower than diameter of one eye
Mycetocharina Seidlitz, 1896 (Figs. 6a, b)	Narrow, elongate/ elongate triangular	Long	Quadratish or semicircular, matte	Flat, parallel, matte	Longer	Narrower than diameter of one eye



Figs. 1-6: a- habitus; b- body outline; c- locality label. 1- *Allecula morio* (Fabricius, 1787); 2- *Havanalia qazvinica* Novák, 2020; 3- *Hymenorus doublieri* Mulsant, 1852; 4- *Hymenorus indicus* Fairmaire, 1896; 5- *Magdanalia denticulata* (Muche, 1982); 6- *Mycetocharina kabateki* Novák, 2006.

Etymology. The name is compound from Greek letter (*gamma*) and ending (*-norus*) marking similarity to the genus *Hymenorus* Mulsant, 1852. Gender: masculine.

Distribution. Iran and Iraq.

Gammanorus iranicus sp. nov.
(Figs. 7-11)

Type locality. Central Iran, Fars province, Yâsûg northwestern of Šîraâz (Kâkân village), 30° 40' N 51° 43' E.

Type material. Holotype (♂): C Iran p. Fars, Yâsûg NW / Širaaz (vill. Kâkân), / 3040N 5143E 13.VI.1999 / lgt. P. Kabátek, (VNPC). Paratypes: (1 ♀): IRAN, Lorestan, 50km N / Andimeshk, Sar Takht / 2000m, 3. - 7. V. 2007, / Anichtchenko A. leg., (VNPC); (1 ♂): IRAN, Kerman, Sirjan / 8 km N Balvard / 11. - 12. V. 2007, / Anichtchenko A. leg., (VNPC); (1 ♂, 1 ♀): IRANm prov. Yazd, / Shirkuh Mts, / 6 km W of Taft Aliabad // 2200 m / 4-5. X. 2002, / leg.P. Gyulai & A.Garai, (HMNH, VNPC); (3 ♂♂): IRAN, Prov. Fars / Saadat -Shan, 1900 m / 53°12´38´´E; 30°05´21´´N / 02. V. 2001 / leg: Gy. Fábián & K. Vig., (HMNH, VNPC); (1 ♂, 2 ♀♀): IRAQ, Sulaymaniyah / Dukan, Zarzi vill. / 25.05.2022 / Farhad A. Khundhur leg., (LPBC, VNPC). The types are provided with a printed red label: 'Gammanorus / iranicus sp. nov. / HOLOTYPUS or PARATYPUS / V. Novák det. 2025'.

Description of holotype. Habitus as in Fig. 7, medium-sized, elongate-oval, parallel, slightly convex, shiny, from pale reddish brown to brown, dorsal surface with pale setae, punctures and very fine microgranulation, BL 6.98 mm. Widest near two thirds elytral length; BL/EW 2.92.

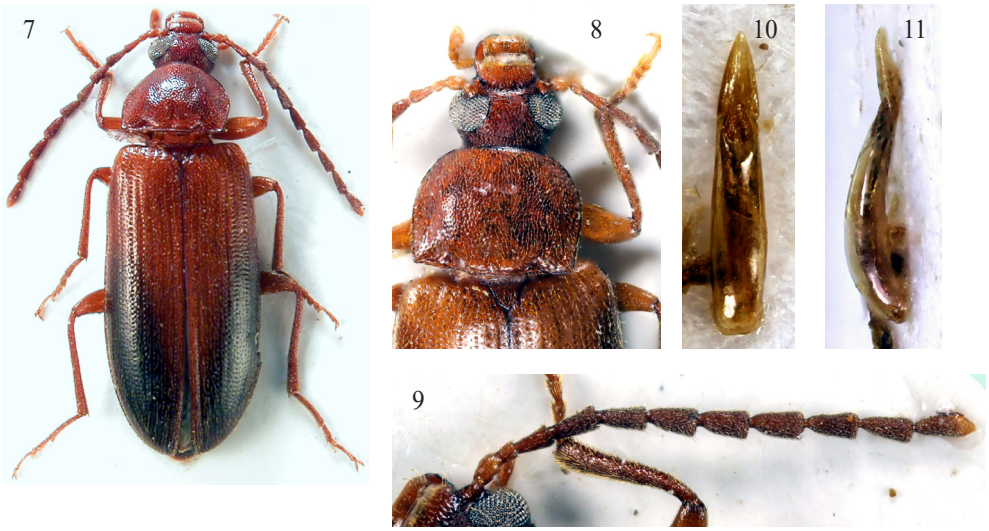
Head (Fig. 8) wider than long, through the eyes narrower than base of pronotum. Dorsal surface reddish brown, shiny with sparse, pale setae, and coarse punctures. Clypeus transverse, shiny, pale reddish brown, with dense long, pale setae, and a few punctures, distinctly excised in middle of apex. Mandibles pale reddish brown, glabrous, shiny with pale setae in sides, margins and apex darker. HW 1.13 mm; HW/PW 0.67; HL (visible part) 0.93 mm. Eyes large, transverse, excised, space between eyes narrow, approximately as wide as diameter of one eye; OI equal to 35.00.

Antenna (Fig. 9). Long, brown (AL 3.89 mm, exceeding half body length - AL/BL 0.57). Dorsal surface with short, recumbent, pale setae and dense, small punctures and microgranulation. Antennomeres 1 and 2 slightly shiny, remainder matte, antennomere 2 shortest, antennomeres 4-11 longer than antennomere 3. Antennomeres 1-3 pale reddish brown, antennomeres 3-10 widest in apex.
RLA(1-11): 1.12 : 0.57 : 1.00 : 1.31 : 1.37 : 1.34 : 1.34 : 1.55 : 1.49 : 1.55 : 1.49.
RL/WA(1-11): 2.21 : 1.65 : 1.97 : 2.20 : 2.24 : 2.05 : 2.31 : 2.74 : 2.56 : 2.84 : 2.90.

Maxillary palpus pale reddish brown, semi-matte, with pale setae and microgranulation. Palpomeres 2 and 3 distinctly narrowest at base and widest at apex, ultimate palpomere widened apically, axe-shaped.

Pronotum (Fig. 8). Reddish brown, shiny, convex, widest near middle of lateral margins, in base distinctly narrower than elytra at humeri. Dorsal surface with pale setae and punctures. Lateral margins straight in basal half, arcuate in apical part. PL 1.27 mm; PW (base) 1.69 mm; PI equal to 75.90. Border lines narrow, margins conspicuous from dorsal view. Anterior margin almost straight, base with shallow impression in middle and two deep impressions between middle and posterior angles. Anterior angles indistinct, posterior angles obtuse.

Elytra. Pale reddish brown with dark brown parts in apical half (as ín Fig. 7), elongate oval, convex, shiny, widest near two thirds elytra length. Dorsal surface with dense, pale setae. EL 4.98 mm; EW 2.79 mm; EL/EW 2.08. Elytral striae with rows of small, coarse



Figs. 7-11. *Gammanorus iranicus* sp. nov. (male holotype): 7- habitus; 8- head, pronotum and maxillary palpus; 9- antenna; 10- aedeagus, dorsal view; 11- aedeagus, lateral view.

punctures. Elytral intervals flat, with punctures smaller than those in striae and very fine microgranulation.

Scutellum. Pale reddish brown with sides darker, shiny, with a few pale setae, and punctures.

Elytral epipleura well-developed, reddish brown, with sparse punctures and sparse, pale setae leads parallel from mesoventrite.

Legs. Long and narrow, pale reddish brown, dorsal surface with dense, recumbent, pale setae, and small punctures. Penultimate tarsomeres slightly widened and lobed. RLT: 1.00 : 0.61 : 0.46 : 0.71 : 1.47 (protarsus); 1.00 : 0.42 : 0.34 : 0.38 : 0.97 (mesotarsus); 1.00 : 0.40 : 0.27 : 0.74 (metatarsus).

Protarsal claws pale reddish brown, both with 8 teeth.

Ventral side of body reddish brown with pale setae and punctures. Abdomen shiny, with recumbent, pale setae, small punctures and fine microgranulation.

Aedeagus (Figs. 10, 11) ochre yellow, shiny. Basal piece rounded laterally and slightly narrowing in dorsal view, apical piece triangular in dorsal view, beak-shaped dorsally and laterally. Ratio of length of apical piece to length of basal piece in dorsal view 1: 2.60.

Female. Body slightly wider than in male, space between eyes a little wider than in male.
Measurements of female body. BL 7.39 mm; HL 0.92 mm; HW 1.11 mm; OI 43.48; PL 1.33 mm; PW 1.86 mm; PI 71.50; EL 5.14 mm; EW 2.62 mm; AL 3.24 mm; AL/BL 0.44; HW/PW 0.60; BL/EW 2.82; EL/EW 1.96.
RLA(1-11): 1.03 : 0.63 : 1.00 : 1.26 : 1.38 : 1.48 : 1.52 : 1.74 : 1.61 : 1.48 : 2.10.
RL/WA(1-11): 1.78 : 1.63 : 2.07 : 1.95 : 1.72 : 1.70 : 1.96 : 2.35 : 1.79 : 1.43 : 2.83.

Variability. The type specimens somewhat vary in size; each character is given as its mean value, with full range in parentheses. Males (n= 7). BL 6.27 mm (4.93-7.50 mm); HL 0.86 mm (0.76-0.93 mm); HW 1.07 mm (0.89-1.25 mm); OI 33.38 (31.99-35.08); PL 1.13 mm (0.88-1.34 mm); PW base 1.55 mm (1.22-1.87 mm); PI 73.16 (70.81-75.91); EL 4.30 mm (3.29-5.24 mm); EW 2.21 mm (1.65-2.79 mm). Females (n= 3). BL 6.97 mm (6.55-7.39 mm); HL 0.93 mm (0.92-0.93 mm); HW 1.12 mm (1.11-1.12 mm); OI 42.50 (41.58-43.48); PL 1.26 mm (1.19-1.33 mm); PW 1.71 mm (1.55-1.86 mm); PI 74.14 (71.50-76.77); EL 4.79 mm (4.43-5.14 mm); EW 2.43 mm (2.24-2.62 mm).

Differential diagnosis. The new species *Gammanorus iranicus* sp. nov. distinctly differs from the similar species *Gammanorus evae* (Novák, 2006) comb. nov. and *Gammanorus gerdae* (Novák, 2006) comb. nov. mainly by the anterior angles of pronotum being indistinct, rounded; while *G. evae* and *G. gerdae* have the anterior angles of the pronotum distinct.

G. iranicus is clearly different from the similar species *G. gracilis* sp. nov. mainly by the body wider and shorter (BL/EW less than 3), by the antenna shorter, exceeding half body length and by antennomeres 4-10 1.4-2.9 times longer than wide; while *G. gracilis* has a narrower and longer body (BL/EW 3.20), the antenna is longer, exceeding three quarters the body length and by antennomeres 4-10 3.1-4.4 times longer than antennomere 3.
G. iranicus distinctly differs from the similar species *Gammanorus rakovici* sp. nov. mainly by antennomere 4 being 1.35 times longer than antennomere 3, antennomeres 5-10 1.35-1.5 times longer than antennomere 3; while *G. rakovici* has antennomere 4 2.44 times longer than antennomere 3 and antennomeres 5-10 are 2.4-2.9 times longer than antennomere 3.

Etymology. Toponymic, after the name of the country of its origin (Iran).

Distribution. Iran and Iraq.

Gammanorus gracilis sp. nov.
(Figs. 12-16)

Type locality. Western Iran, Lorestan Province, 10 km southwestern of Dorud, N 33°26´, 49°00´E, 1431 m.

Type material. Holotype (♂): W IRAN (Lorestan) / 10 km SW Dorüd 1431 m / 3326N / 4900E (lux) / 9.7.2004 M. Rejzek, (VNPC). The type is provided with a printed red label: 'Gammanorus / gracilis sp. nov. / HOLOTYPUS / V. Novák det. 2025'.

Description of holotype (male). Habitus as in Fig. 12, small-sized, narrow, elongate, parallel, shiny, from ochre yellow to reddish brown, dorsal surface with pale setae, punctures and fine microgranulation, BL 5.22 mm. Widest near two thirds elytral length; BL/EW 3.20.

Head (Fig. 13) as wide as long, through the eyes wider than anterior margin and slightly narrower than base of pronotum. Dorsal surface shiny with sparse, long, pale setae and punctures. Posterior part reddish brown, anterior part slightly paler with sparse microgranulation. Clypeus transverse, shiny, pale reddish brown, with long, pale setae and a few punctures. Mandibles pale reddish brown with apex blackish brown, glabrous, shiny with pale setae in dark sides. HW 0.92 mm; HW/PW 0.86; HL (visible part) 0.92 mm. Eyes

large, transverse, excised, space between eyes narrow, approximately as wide as width of one eye; OI equal to 33.83.

Antenna (Fig. 14). Long, (AL 4.03 mm, exceeding three quarters body length - AL/BL 0.78). Dorsal surface with long, recumbent, pale setae, dense, small punctures and microgranulation. Antennomeres 1-3 very short, shiny, antennomere 2 shortest, antennomeres 4-11 matte, more than three times longer than antennomere 3. Antennomeres 3-10 widest in apex, slightly serrate.

RLA(1-11): 1.29 : 0.82 : 1.00 : 3.06 : 3.29 : 3.48 : 3.94 : 3.88 : 4.35 : 3.88 : 4.47.

RL/WA(1-11): 1.22 : 1.00 : 1.00 : 2.36 : 2.44 : 2.58 : 2.66 : 2.75 : 2.96 : 3.30 : 4.75.

Maxillary palpus ochre yellow, semi-matte, with pale setae, microgranulation and very small punctures. Palpomeres 2 and 3 distinctly narrowest at base and widest at apex, ultimate palpomere axe-shaped.

Pronotum (Fig. 13). Pale reddish brown, shiny, widest near middle of lateral margins, in base distinctly narrower than elytra at humeri. Dorsal surface with long, pale setae, punctures and fine microgranulation. Lateral margins almost parallel in basal half, arcuate in apical part. PL 0.92 mm; PW (base) 1.25 mm; PI equal to 76.92. Border lines narrow, margins conspicuous from dorsal view. Anterior margin almost straight, base very slightly rounded. Anterior angles indistinct, posterior angles obtuse.

Elytra. Ochre yellow, long and narrow, almost parallel, shiny, widest near two thirds elytra length. Dorsal surface with pale setae. EL 3.51 mm; EW 1.63 mm; EL/EW 1.82. Elytral striae with rows of coarse punctures. Elytral intervals flat, with microgranulation and sparse punctures.

Scutellum. Pale reddish brown, pentagonal, semi-matte, with a few long, pale setae, a few shallow punctures and microgranulation.

Elytral epipleura well-developed, ochre yellow, with pale setae, distinctly narrowing to ventrite 1, then narrowing and parallel on apical part.

Legs. Long and narrow, pale reddish brown or ochre yellow, dorsal surface with dense, pale setae, and small punctures. Protibiae distinctly widened apically. Penultimate tarsomeres slightly widened and lobed. RLT: 1.00 : 0.64 : 0.38 : 0.46 : 0.91 (protarsus); 1.00 : 0.50 : 0.40 : 0.27 : 0.87 (mesotarsus); 1.00 : 0.48 : 0.19 : 0.57 (metatarsus).

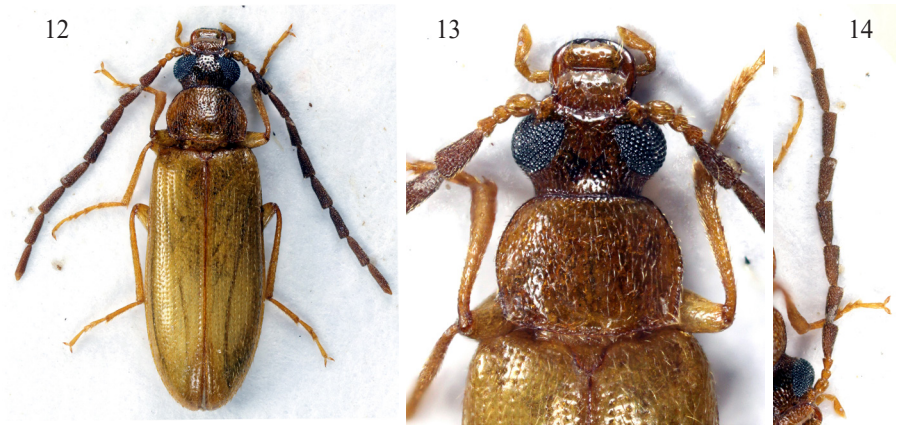
Protarsal claws pale reddish brown, both with 9 teeth.

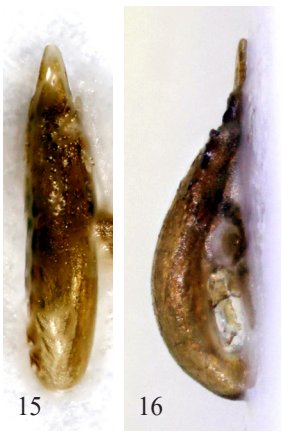
Ventral side of body reddish brown with punctures. Abdomen ochre yellow, shiny, with pale setae, small punctures and microgranulation.

Aedeagus (Figs. 15, 16) ochre yellow, semi-matte. Basal piece rounded laterally, apical piece widely triangular in dorsal view, beak-shaped from dorsal and lateral views. Ratio of length of apical piece to length of basal piece in dorsal view 1: 4.16.

Female unknown.

Differential diagnosis. The new species *Gammanorus gracilis* sp. nov. distinctly differs from the similar species *Gammanorus evae* (Novák, 2006) comb. nov. and *Gammanorus gerdae* (Novák, 2006) comb. nov. mainly by the anterior angles of the pronotum indistinct, rounded; while *Gammanorus evae* and *G. gerdae* have anterior angles of the pronotum distinct.





Figs. 12-16. *Gammanorus gracillis* sp. nov. (male holotype): 12- habitus; 13- head, pronotum and maxillary palpus; 14- antenna; 15- aedeagus, dorsal view; 16- aedeagus, lateral view.

G. gracilis is clearly different from the similar species *Gammanorus iranicus* sp. nov. and *Gammanorus rakovici* sp. nov. mainly by the narrower and longer body (BL/EW 3.20) and by the antenna long, exceeding three quarters the body length and by antennomeres 4-10 3.1-4.4 times longer than antennomere 3; while *G. iranicus* and *G. rakovici* have the body wider and shorter (BL/EW less than 3), the antennae are shorter than three quarters of the body length, and antennomeres 4-10 are 1.4-2.9 times longer than wide.

Etymology. From the Latin *gracilis* („slim“).

Distribution. Iran.

***Gammanorus rakovici* sp. nov.**
(Figs. 17-21)

Type locality. Southwestern Iran, Zagros mountains, Kuhgiloyeh & Boyerahmad province, 30°59′36′′-31°00′15′′, N 50°08′47′′- 09′01′′E, 45 km easter of Behbahan, Maghan ridge, 1500-1650 m.

Type material. Holotype (♂): IRAN-SW, Zagros Mts. / Kuhgiloyeh & Boyerahmad prov., / 30°59′36′′-31°00′15′′N 50°08′47′′- / 09′01′′E, Behbahan (45km NNW): / MAGHAR Ridge, 1500-1650m, / 7.v.2016 Vít Kubáň leg. // IRAN 2016 collecting trip: Vít Kubáň, Marek Kafka, / Roman Rejzek, David Frank / At light, (VNPC). Paratypes: (2 ♀♀): same data as holotype, (VNPC) ; (1 ♂, 1 ♀): IRAN, Fars prov. / 59 km W Shiraz, 15 km E / Dasht-e Arzhan / 27.-29.V.2015, 2200 m / N29°33′23.44′′, E51°56′45.47′′ / M. Obořil lgt., (LPBC, VNPC); (1 ♀): IRAN, Fars prov. / 58 km W Shiraz, 2 km W Sangar / 25.-26.V.2015, 2194 m / N29°59′37.08′′, E52°7′56.64′′ / M. Obořil lgt., (VNPC). The types are provided with a printed red label: 'Gammanorus / rakovici sp. nov. / HOLOTYPUS or PARATYPUS / V. Novák det. 2025'.

Description of holotype (male). Habitus as in Fig. 17, medium-sized, narrow, elongate, slightly oval, parallel, shiny, from ochre yellow to reddish brown, dorsal surface with pale setae, punctures and fine microgranulation, BL 6.33 mm. Widest near two thirds elytral length; BL/EW 2.96.

Head (Fig. 18) reddish brown, slightly wider than long, through the eyes slightly wider than anterior margin and narrower than base of pronotum. Dorsal surface shiny with pale setae (anterior part with longer erect setae), fine microgranulation and coarse punctures. Clypeus transverse, reddish brown, with long, erect pale setae, punctures and fine microgranulation. Mandibles reddish brown with apex blackish brown, glabrous, shiny with pale setae in sides. HW 1.09 mm; HW/PW 0.80; HL (visible part) 1.03 mm. Eyes large, transverse, excised, space between eyes narrow, approximately as wide as diameter of one eye; OI equal to 32.69.

Antenna (Fig. 19). Long, (AL 4.56 mm, exceeding two thirds body length - AL/BL 0.72). Dorsal surface with short, recumbent, pale setae, dense, small punctures and microgranulation. Antennomere 2 shortest, antennomeres 1-3 pale reddish brown, semi-matte, antennomeres 4-11 reddish brown, matte. Antennomeres 1 and 4-10 longer than antennomere 3. Antennomeres 3-10 widest in apex, slightly serrate.
RLA(1-11): 1.30 : 0.74 : 1.00 : 2.44 : 2.44 : 2.52 : 2.70 : 2.87 : 2.74 : 2.70 : 3.13.
RL/WA(1-11): 2.00 : 1.42 : 1.77 : 2.80 : 2.80 : 2.90 : 3.10 : 3.67 : 3.71 : 3.88 : 5.14.

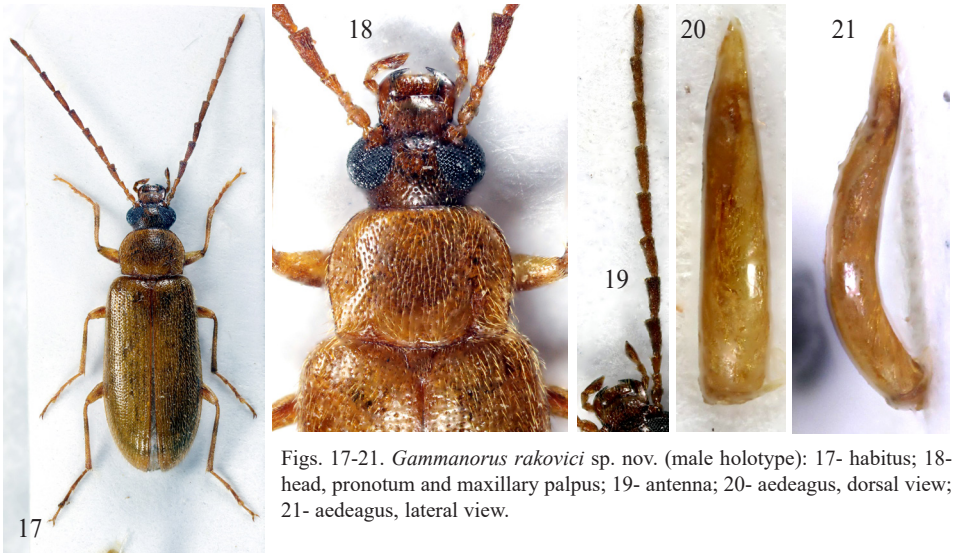
Maxillary palpus pale reddish brown, semi-matte, with long, pale setae and microgranulation. Palpomeres 2 and 3 distinctly narrowest at base and widest at apex, ultimate palpomere axe-shaped.

Pronotum (Fig. 18). Ochre yellow, shiny, widest near middle of lateral mergins, in base slightly narrower than elytra at humeri. Dorsal surface with long, pale setae, coarse punctures and fine microgranulation. Lateral margins almost parallel in basal half, arcuate in apical third, with shallow impression near middle. PL 1.09 mm; PW (base) 1.36 mm; PI equal to 80.15. Border lines very narrow, margins conspicuous from dorsal view. Anterior margin almost straight, base with two deep impressions between middle and posterior angles. Anterior angles indistinct, posterior angles obtuse.

Elytra. Ochre yellow, elongate, parallel, shiny, widest near two thirds elytra length. Dorsal surface with dense, pale setae. EL 4.21 mm; EW 2.14 mm; EL/EW 1.97. Elytral striae with rows of coarse punctures. Elytral intervals flat, with fine microgranulation and a few small punctures.

Scutellum. Ochre yellow pentagon, shiny, with long, pale setae, and dense punctures.

Elytral epipleura well-developed, ochre yellow, with pale setae distinctly narrowing to ventrite 1, then becoming narrow and parallel on apical part.



Figs. 17-21. *Gammanorus rakovici* sp. nov. (male holotype): 17- habitus; 18- head, pronotum and maxillary palpus; 19- antenna; 20- aedeagus, dorsal view; 21- aedeagus, lateral view.

Legs. Long and narrow, ochre yellow, dorsal surface with dense, recumbent, pale setae, small punctures and microgranulation. Penultimate tarsomeres slightly widened and lobed. RLT: 1.00 : 0.58 : 0.50 : 0.50 : 1.04 (protarsus); 1.00 : 0.62 : 0.31 : 0.46 : 1.23 (mesotarsus); 1.00 : 0.45 : 0.30 : 0.75 (metatarsus).

Protarsal claws ochre yellow, both with 8 teeth.

Ventral side of body brown, prothorax reddish brown. Abdomen brown, with recumbent, pale setae. Ventrites 3-5 dark brown.

Aedeagus (Figs. 20, 21) ochre yellow, semi-matte. Basal piece rounded laterally, apical piece triangular dorsally, beak-shaped in dorsal and lateral views. Ratio of length of apical piece to length of basal piece in dorsal view 1: 2.60.

Female. Body slightly wider than in male, antenna distinctly shorter than in male (AL/BL 0.54), antennomere 1 slightly shorter than antennomere 3.
Measurements of female body. BL 6.95 mm; HL 0.95 mm; HW 1.04 mm; OI 33.90; PL 1.17 mm; PW 1.61 mm; PI 72.67; EL 4.83 mm; EW 2.46 mm; AL 3.78 mm; AL/BL 0.54; HW/PW 0.65; BL/EW 2.83; EL/EW 1.96.
RLA(1-11): 0.90 : 0.57 : 1.00 : 1.34 : 1.38 : 1.41 : 1.41 : 1.54 : 1.38 : 1.41 : 1.71.
RL/WA(1-11): 2.12 : 1.84 : 2.18 : 2.83 : 3.11 : 3.19 : 2.87 : 3.03 : 2.80 : 2.97 : 4.00.

Variability. The type specimens somewhat vary in size; each character is given as its mean value, with full range in parentheses. Males (n= 2). BL 5.75 mm (5.13-6.33 mm); HL 0.95 mm (0.86-1.03 mm); HW 1.02 mm (0.94-1.09 mm); OI 30.38 (29.53-31.22); PL 1.01 mm (0.84-1.09 mm); PW base 1.32 mm (1.02-1.61 mm); PI 81.25 (80.15-82.35); EL 3.84 mm (3.47-4.21 mm); EW 1.90 mm (1.65-2.14 mm). Females (n= 4). BL 6.30 mm (5.96-6.95 mm); HL 0.86 mm (0.78-0.95 mm); HW 1.00 mm (0.95-1.04 mm); OI 32.36 (29.05-34.12);

PL 1.10 mm (1.01-1.17 mm); PW base 1.52 mm (1.46-1.61 mm); PI 72.17 (69.18-74.67); EL 4.34 mm (4.06-4.83 mm); EW 2.19 mm (2.04-2.46 mm).

Differential diagnosis. The new species *Gammanorus rakovici* sp. nov. distinctly differs from the similar species *Gammanorus evae* (Novák, 2006) comb. nov. and *Gammanorus gerdae* (Novák, 2006) comb. nov. mainly by the anterior angles of the pronotum indistinct, rounded; while *G. evae* and *G. gerdae* have the anterior angles of the pronotum distinct.

G. rakovici is clearly different from the similar species *G. gracilis* sp. nov. mainly by the body being wider and shorter (BL/EW less than 3), by the antenna exceeding two thirds body length and by antennomeres 4-10 1.4-2.9 times longer than wide; while *G. gracilis* has narrower and longer body (BL/EW 3.20), antenna exceeding three quarters body length and antennomeres 4-10 are 3.1-4.4 times longer than antennomere 3.

G. rakovici is clearly different from the similar species *Gammanorus iranicus* sp. nov. mainly by antennomere 4 2.44 times longer than antennomere 3, antennomeres 5-10 2.4-2.9 times longer than antennomere 3; while *G. iranicus* has antennomere 4 1.35 times longer than antennomere 3 and antennomeres 5-10 are 1.35-1.5 times longer than antennomere 3.

Etymology. Patronymic, in honour of Miloslav Rakovič, well-known expert in the beetle family Scarabaeidae, and a long time editor of English versions of some Czech entomological journals, who died last year.

Distribution. Iran.

Gammanorus evae (Novák, 2006) comb. nov.
(Fig. 22)

Hymenophorus evae Novák, 2006: 318.
Hymenorus evae (Novák, 2006): Bousquet et al. 2015: 133.

Type locality. Iran, Hormozgan province, environs of Doveri village, 1000 m.

Material examined. (holotype ♂): Iran, prov. Hozmozan / Doveri vill. env. / IV. 2000, 1000 m / Plutenko lgt., (VNPC).

Remark. After checking the habitus of a male specimen as in Novák (2006: 319: fig. 1) and further characters as in Novák (2006: 319: figs. 2, 3 and 320: figs. 9-15) it is clear that the species belongs to *Gammanorus* gen. nov.

Gammanorus gerdae (Novák, 2006) comb. nov.
(Fig. 23)

Hymenophorus gerdae Novák, 2006: 322.
Hymenorus evae (Novák, 2006): Bousquet et al. 2015: 133.

Type locality. Eastern Iran, Deh Bakri, 1700-1750 m.

Fig. 22. *Gammanorus evae* (Novák, 2006) comb. nov. (male holotype): head and pronotum.

Fig. 23. *Gammanorus gerdae* (Novák, 2006) comb. nov. (male holotype): head and pronotum.

Material examined. (holotype ♂): E Iran, Deh Bakri / 1700-1750 m / 30.4.-3.5.1973 // Loc. no. 186 / Exp. Nat. Mus. / Praha, (VNPC).

Remark. After checking the habitus of a male specimen as in Novák (2006: 319: fig. 4) and further characters as in Novák (2006: figs. 5, 323: figs. 16-22) it is clear that the species belongs to *Gammanorus* gen. nov.

KEY TO THE MALES OF *GAMMANORUS* GEN. NOV. SPECIES FROM IRAN

1(2) Anterior angles of pronotum distinct. 3
2(1) Anterior angles of pronotum indistinct, rounded. 5
3(4) Punctuation of pronotum sparse, interspaces between punctures wider than diameter of punctures. Pronotum with impressions near base. Head and pronotum (Fig. 23). *Gammanorus gerdae* (Novák, 2006) comb. nov.
4(3) Punctuation of pronotum dense, interspaces between punctures narrower than diameter of punctures. Pronotum with holes near base. Head and pronotum (Fig. 22). ..... *Gammanorus evae* (Novák, 2006) comb. nov.
5(6) Body narrower, longer (BL/EW 3.20), antenna exceeding three quarters body length, antennomeres 4-10 3.1-4.4 times longer than antennomere 3. Habitus as in Fig. 12, head and pronotum (Fig. 13), antenna (Fig. 14), aedeagus (Figs. 15, 16). ..... *Gammanorus gracilis* sp. nov.
6(5) Body wider and shorter (BL/EW ??, antenna exceeding half body length, antennomere 4-10 1.4-2.9 times longer than antennomere 3. 7
7(8) Antennomere 4 1.35 times longer than antennomere 3, antennomeres 5-10 1.35-1.5 times longer than antennomere 3. Habitus as in Fig. 7, head and pronotum (Fig. 8), antenna (Fig. 9), aedeagus (Figs. 10, 11). .. .. *Gammanorus iranicus* sp. nov.
8(7) Antennomere 4 2.44 times longer than antennomere 3, antennomeres 5-10 2.4-2.9 times longer than antennomere 3. Habitus as in Fig. 17, head and pronotum (Fig. 18), antenna (Fig. 19), aedeagus (Figs. 20, 21). ..... *Gammanorus rakovici* sp. nov.

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