

## ***Bolbelasmus (Bolbelasmus) zagrosensis* (Coleoptera: Scarabaeoidea: Bolboceratidae), a new species from Iran, along with an updated key to the western Palearctic species of the subgenus**

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### **Abstract**

*Bolbelasmus (Bolbelasmus) zagrosensis* Sommer, Hillert, Hružová & Král, **new species**, from Iran is described, illustrated and compared with its congeners known from the western Palearctic region. An updated key to the western Palearctic species of the nominotypical subgenus is provided. New country record of *B. (B.) nireus* (Reitter, 1895) from Greece (island of Rhodes) is reported. Distribution of *B. (B.) makrisi* Miessen, 2011, *B. (B.) nireus* and the new species is summarized and mapped.

**Key words:** Coleoptera, Scarabaeoidea, Bolboceratidae, Bolboceratinae, *Bolbelasmus*, taxonomy, new species, distribution, Iran, Rhodes, Palearctic region

### **Introduction**

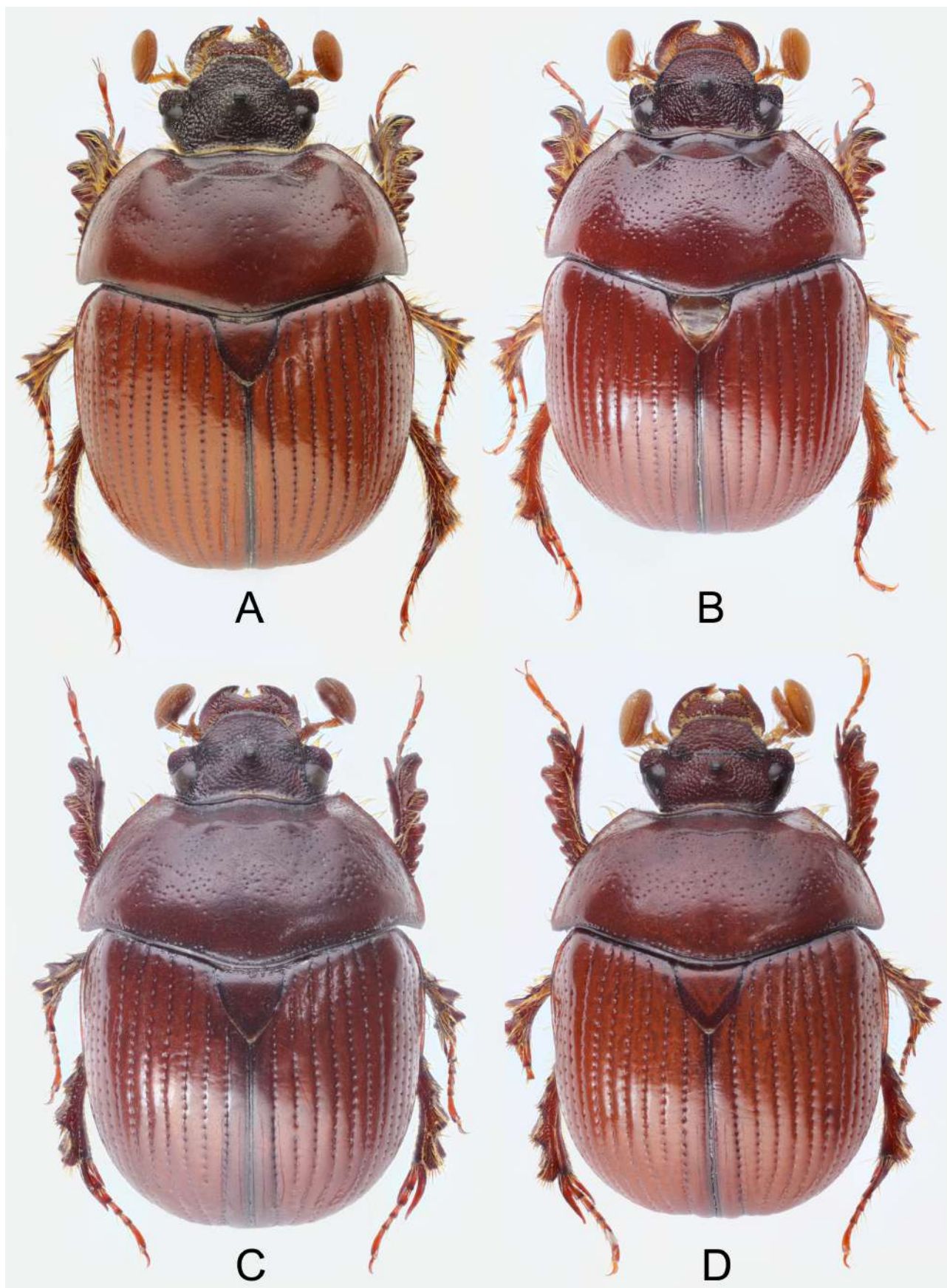
The genus *Bolbelasmus* was described by Boucomont (1911) and in the current concept it is classified into two subgenera (*Bolbelasmus* Boucomont, 1911 and *Kolbeus* Boucomont, 1911) with 28 formally described species (Hillert *et al.* 2016; López-Colón & Bahillo de la Puebla 2016; Nikolajev *et al.* 2016; Schoolmeesters 2020). Eight taxa are distributed throughout the New World (Howden 1964; Howden & Solís 1995), eleven are known from Europe and the Mediterranean Region (Krikken 1977; Hillert *et al.* 2016) and nine are native to the Himalaya, Far East of Russia, eastern and south-eastern Asia (Krikken 1977; Li *et al.* 2008).

### **Material and methods**

Material was examined with an Olympus SZ61 stereomicroscope and a Nikon SMZ 745 stereomicroscope, measurements were taken with an ocular grid. The habitus photographs were taken using a Canon EF-S 60mm f/2.8 Macro USM lens attached to a Canon EOS 70D camera. Partially focused images of each specimen were combined using Zerene Stacker (Zerene Systems LLC, Richland, USA). All pictures were digitally enhanced using Adobe Photoshop CC. The distribution maps were produced and edited in ESRI ArcMap 10.6 of ArcGIS Desktop 10.6 suite. For map layers, free levels 0–1 data from Global Administrative Areas (<http://www.gadm.org>, ver. 2.8), Natural Earth (<http://naturalearthdata.com>, Natural Earth I with Shaded Relief, Water, and Drainages), combined with World Shaded Relief (<https://www.arcgis.com/home/item.html?id=9c5370d0b54f4de1b48a3792d7377ff2>) (with 45% transparency) were used. Coordinates and altitude are assigned for each locality mentioned in the text (material examined in each species) (see gazetteer, Table 1). These data were used in the construction of distribution maps (see Figs. 9–10).

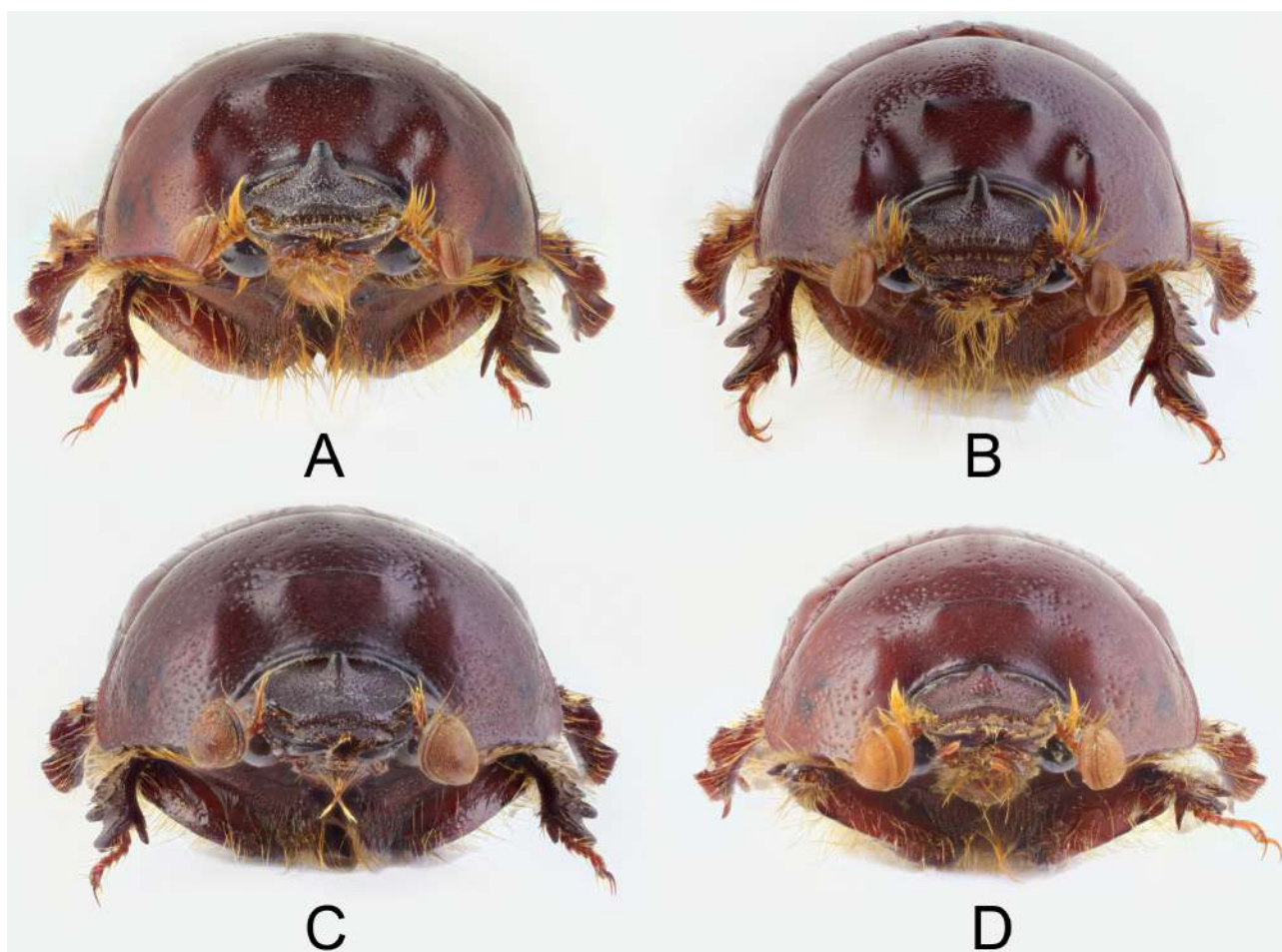
**TABLE 1.** Gazetteer of the known collecting localities of *Bolbelasmus* (*B.*) *makrisi* Miessen, 2011, *B. (B.) nireus* (Reitter, 1895) and *B. (B.) zagrosensis* Sommer, Hillert, Hrušová & Král, **new species**, with their geographic coordinates and altitude data; \* type localities

species	country	locality	N	E	~ altitude m a.s.l.
* <i>B. makrisi</i>	Cyprus	Kourion	34°39'50"N,	32°53'09"E	60
<i>B. makrisi</i>	Cyprus	Lara	34°59'44"N	32°18'57"E	60
<i>B. makrisi</i>	Cyprus	Miliou	34°56'22"N	32°27'35"E	260
<i>B. makrisi</i>	Cyprus	Pegeia	34°53'50"N	32°22'19"E	390
<i>B. makrisi</i>	Cyprus	Rizoelia National Forest Park	34°56'30"N	33°34'17"E	90
<i>B. nireus</i>	Greece	Lalyssos, Rhodes	36°25'01"N	28°08'44"E	20
<i>B. nireus</i>	Greece	Lindos, Rhodes	36°05'32"N	28°05'06"E	40
<i>B. nireus</i>	Iraq	Assur	35°27'20"N	43°15'39"E	170
* <i>B. nireus</i>	Syria	Akbis, see Maydân Akbis			
<i>B. nireus</i>	Syria	Maydân Akbis	36°49'17"N	36°40'35"E	380
<i>B. nireus</i>	Turkey	Adana	36°59'12"N	35°19'18"E	30
<i>B. nireus</i>	Turkey	Kemer	36°31'51"N	30°32'23"E	60
<i>B. nireus</i>	Turkey	Korkuteli	37°03'60"N	30°11'49"E	1000
<i>B. nireus</i>	Turkey	Manavgat, NE	36°50'36"N	31°30'12"E	100
<i>B. nireus</i>	Turkey	Sebil	37°08'02"N	34°33'48"E	1100
<i>B. nireus</i>	Turkey	Side	36°46'09"N	31°23'33"E	10
<i>B. zagrosensis</i>	Iran	Aivan-i-Kherka, see Kabir Kouh			
<i>B. zagrosensis</i>	Iran	Chahchenar, see Chah chenar			
<i>B. zagrosensis</i>	Iran	Chah chenar	28°56'23"N	55°41'25"E	850
<i>B. zagrosensis</i>	Iran	Chorramabad, see Khorramabad			
<i>B. zagrosensis</i>	Iran	Dasht-e-Arzhan	29°39'00"N	51°59'00"E	2000
<i>B. zagrosensis</i>	Iran	Dehbid, see Safasahr			
<i>B. zagrosensis</i>	Iran	Jasuj	30°35'32"N	51°30'31"E	2070
<i>B. zagrosensis</i>	Iran	Kabir Kouh [mts. N of Dehloran]	32°49'47"N	47°17'19"E	1200
<i>B. zagrosensis</i>	Iran	Khoram-Abad, see Khorramabad			
<i>B. zagrosensis</i>	Iran	Khorramabad	33°19'24"N	48°13'44"E	1690
<i>B. zagrosensis</i>	Iran	Kumaz	33°28'39"N	48°38'55"E	1900
<i>B. zagrosensis</i>	Iran	Safasahr, pass 29 km S	30°20'38"N	53°18'43"E	2200
<i>B. zagrosensis</i>	Iran	Sangar	29°59'58"N	52°08'57"E	2200
* <i>B. zagrosensis</i>	Iran	Sarvestan	29°12'42"N	53°18'41"E	1770
<i>B. zagrosensis</i>	Iran	Yasuj, see Jasuj			



**FIGURE 1A–D.** Habitus of males in dorsal view. A, holotype of *Bolbelasmus zagrosensis* Sommer, Hillert, Hrůzová & Král, **new species**; B, *B. makrisi* Miessen, 2011; C, *B. nireus* (Reitter, 1895) from Greece (Rhodes); D, *B. nireus* from Turkey. Not to scale.





**FIGURE 2A–D.** Pronotum of males in frontal view. A, holotype of *Bolbelasmus zagrosensis* Sommer, Hillert, Hrůzová & Král, **new species**; B, *B. makrisi* Miessen, 2011; C, *B. nireus* (Reitter, 1895) from Greece (Rhodes); D, *B. nireus* from Turkey. Not to scale.

The following codes identify the collections housing the material examined (curators are given in parentheses).

- AHCB—Adam Hergovitz collection, Bratislava, Slovakia;
- DKCB—David Kopr collection, Budeč, Czech Republic;
- DNCL—David Navrátil collection, Litomyšl, Czech Republic;
- DSLH—David Sommer & Lucie Hrůzová collection, Prague, Czech Republic;
- GMCL—Geoffrey Miessen collection, Liège, Belgium;
- HMIM—Hayk Mirzayan Insect Museum, Iranian Research Institute of Plant Protection, Tehran, Iran  
(Hiva Nasserzadeh);
- JMCP—Jiří Mička collection, Prague, Czech Republic;
- JSCP—Jan Schneider collection, Prague, Czech Republic;
- JZCJ—Jaroslav Žák collection, Jezernice, Czech Republic;
- KHCB—Karel Hodek collection, Brno, Czech Republic;
- LDCB—Luboš Dembický collection, Brno, Czech Republic;
- LKCC—Ladislav Klapka collection, Česká Lípa, Czech Republic;
- LSCN—Ludger Schmidt collection, Neustadt, Germany;
- MMCP—Martin Mařík collection, Prague, Czech Republic;
- MNHN—Muséum national d’Histoire naturelle, Paris, France (Antoine Mantilleri, Olivier Montreuil);
- NMPC—National Museum, Prague, Czech Republic (Jiří Hájek);
- OBCL—Olivier Boilly collection, Lille, France;
- OHCB—Oliver Hillert collection, Schöneiche bei Berlin, Germany;
- OMCF—Olivier Montreuil collection, Fleury-les-Aubrais, France;

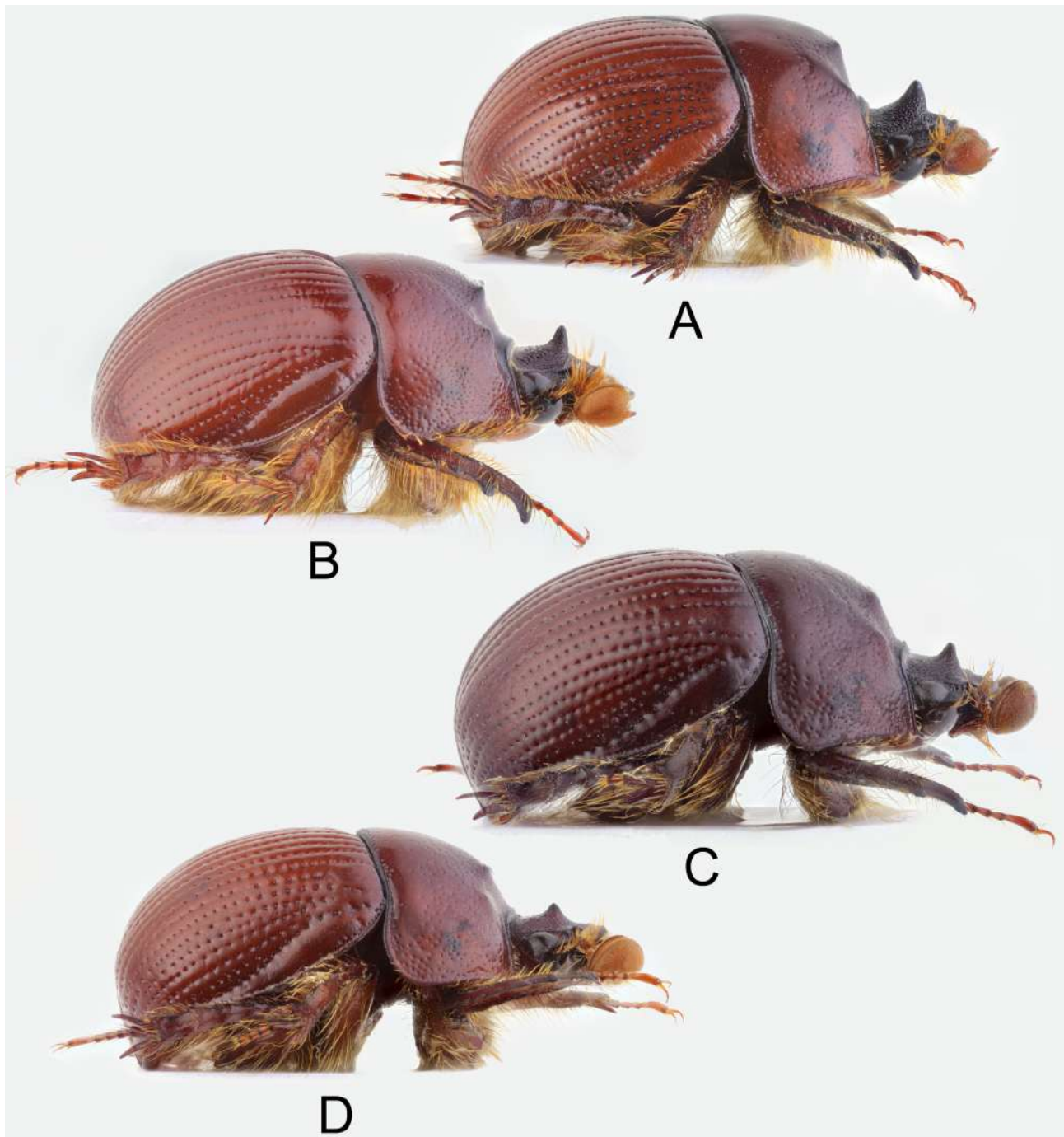
SJCP—Stanislav Jákl collection, Prague, Czech Republic;

ZKCP—Zdeněk Košťál collection, Pardubice, Czech Republic.

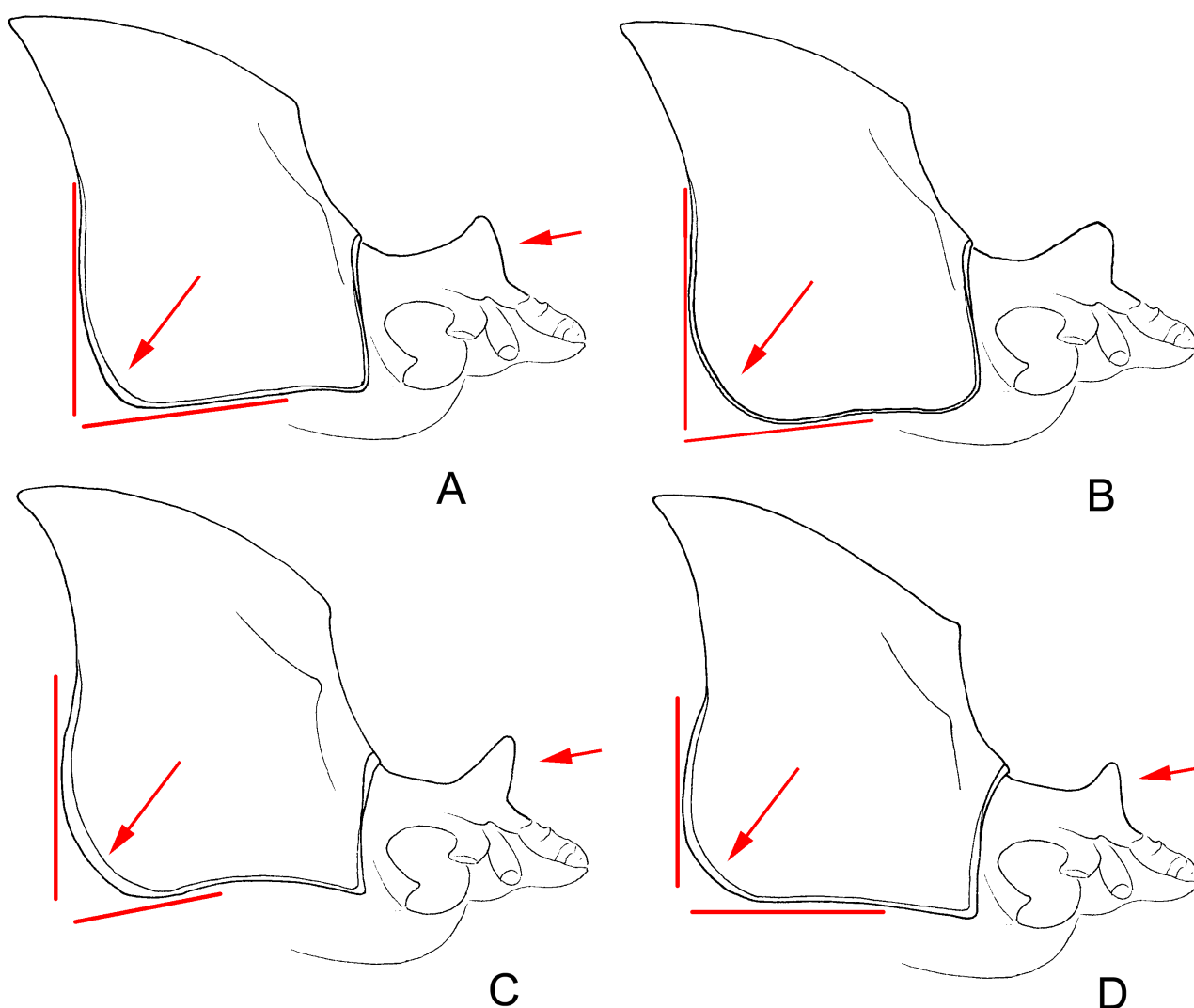
Specimens of the newly described species are provided with one red printed label “*Bolbelasmus* (*Bolbelasmus*) | *zagrosensis* sp. nov. | HOLOTYPUS ♂, ALLOTYPUS ♀ [or] PARATYPUS ♂ [or] ♀ | David Sommer, Oliver Hillert | Lucie Hrůzová & David Král det. 2020”. Verbatim label data are cited for the type material, individual lines of every label are separated by a vertical bar (“|”), individual labels by a double vertical bar (“||”). Information in quotation marks (“ ”) indicates the original spelling. Our remarks and additional comments are found in brackets (“[ ]”), [p]—preceding data within quotation marks are printed, [hw]—the same but handwritten.

Morphological terminology used in the description of adults mainly follows Hillert *et al.* (2016).

Additional specimen information of the two *Bolbelasmus* species were provided as follows.



**FIGURE 3A–D.** Habitus of males in lateral view. A, holotype of *Bolbelasmus zagrosensis* Sommer, Hillert, Hrůzová & Král, new species; B, *B. makrisi* Miessen, 2011; C, *B. nireus* (Reitter, 1895) from Greece (Rhodes); D, *B. nireus* from Turkey. Not to scale.



**FIGURE 4A–D.** Pronotum of males in lateral view. A, *Bolbelasmus zagrosensis* Sommer, Hillert, Hrůzová & Král, **new species**, from Fars province, Iran; B, *B. zagrosensis* Sommer, Hillert, Hrůzová & Král, **new species**, from Lorestan province, Iran; C, *B. makrisi* Miessen, 2011; D, *B. nireus* (Reitter, 1895) from Greece, Rhodes. Not to scale.

***Bolbelasmus (Bolbelasmus) makrisi* Miessen, 2011**

(Figs. 1B, 2B, 3B, 4C, 5B, 9)

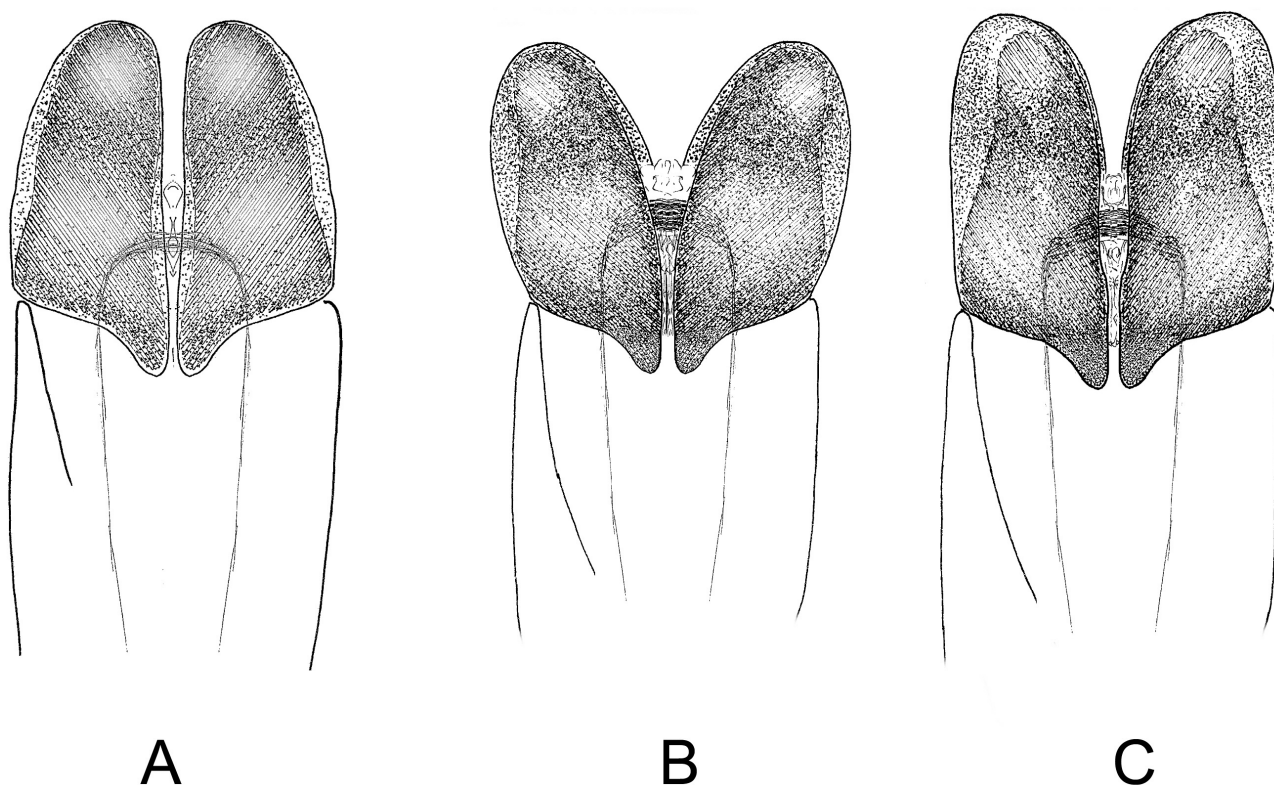
*Bolbelasmus (Bolbelasmus) makrisi* Miessen, 2011: 111, figs. on pp. 116, 118–119 [not numbered] (type locality: “Kourion, Lemesos, alt.: 50 m, Cyprus”).

**Type material examined. Cyprus:** Paratypes, 1 ♂ 1 ♀ (GMCL), “Rizoelia nat. for. Park | Larnaka—CYPRUS || leg.: E. Kakouris | collection: G. Miessen || *Bolbelasmus makrisi* nov. sp. | G. Miessen det. 2011 | PARATYPUS [printed, red label]”.

**Additional material examined. Cyprus:** 1 ♂ 1 ♀ (OHCB), Akamas NP, 5 km N of Lara, 13.–20.iii.2015, O. Hillert lgt.; 1 ♂ (OHCB), Akamas NP, Lara, 13.–20.iii.2015, O. Hillert lgt.; 1 ♂ (OHCB), Miliou, N of Paphos, 13.–20.iii.2015, O. Hillert lgt.; 1 ♂ (OHCB), Miliou, 34°56'22.23"N, 32°27'35.90"E, 7.vi.2014, vivant dans piscine [alive in pool], G. Miessen lgt.; 1 ♂ (OHCB), Miliou, 34°56'21.66"N, 32°27'35.59"E, 7.vi.2014, attiré par lampe UV [attracted by UV light], G. Miessen lgt.; 16 ♂♂ 15 ♀♀ (OHCB) (Figs. 1B, 2B, 3B, 4C, 5B), 2 ♂♂ 2 ♀♀ (NMPC), 5 km NE of Pegeia, Paphos env., 13.–20.iii.2015, O. Hillert lgt.

**Distribution.** Endemic to Cyprus (Nikolajev *et al.* 2016) (see map, Fig. 9).





**FIGURE 5A–C.** Parameres in dorsal view. A, *Bolbelasmus zagrosensis* Sommer, Hillert, Hruřov & Krl, **new species**; B, *B. makrisi* Miessen, 2011; C, *B. nireus* (Reitter, 1895). Not to scale.

***Bolbelasmus (Bolbelasmus) nireus* (Reitter, 1895)**

(Figs. 1C–D, 2C–D, 3C–D, 4D, 5C, 7A–C, 8A–B, 9)

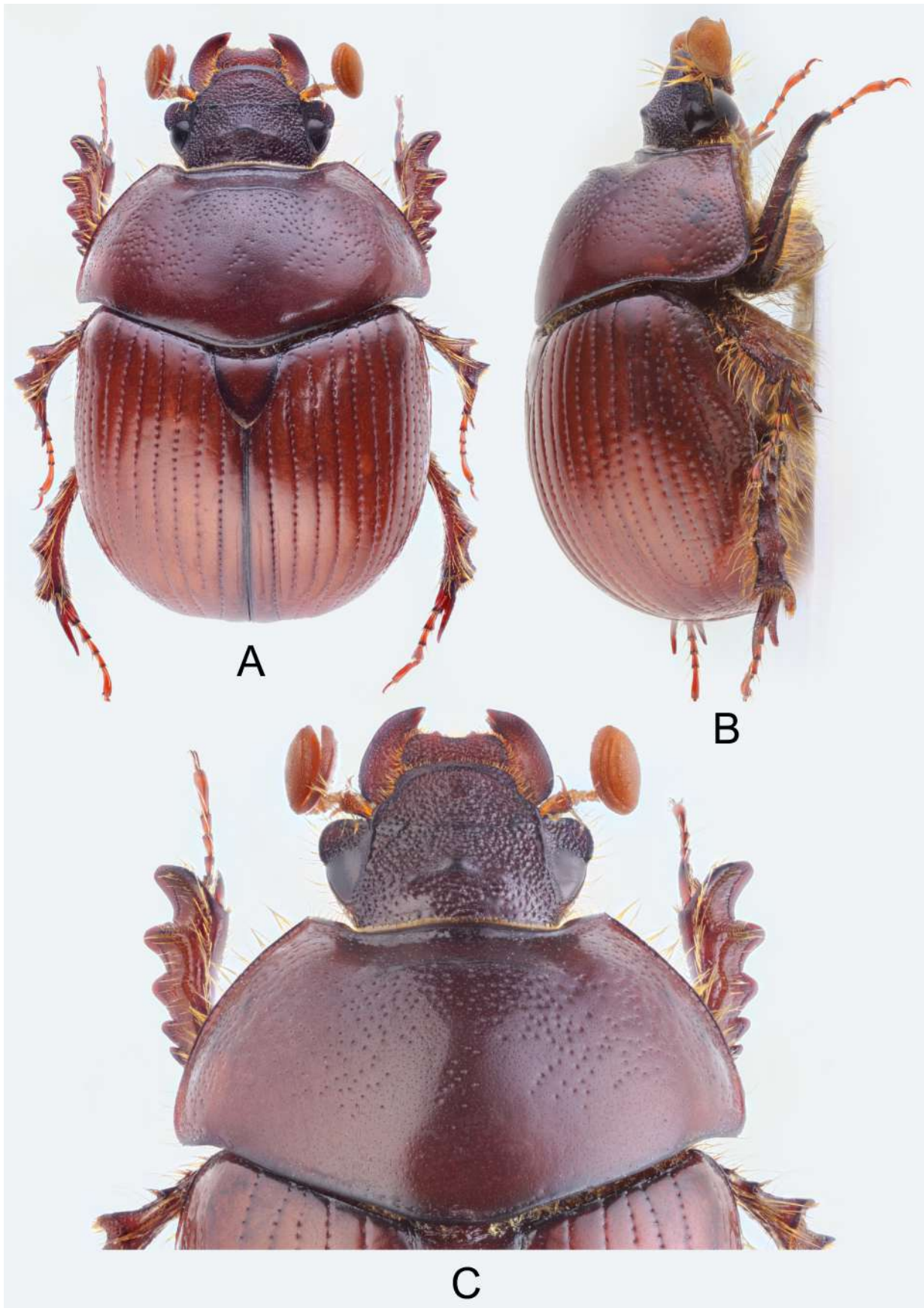
*Bolboceras nireus* Reitter, 1895: 81 (type locality: “Akbes [= Maydn Akbis]”).

**Type material examined.** **Syria:** Holotype, ♀ (MNHN) (Figs. 7A–C, 8A–B) “Bolboceras | Nireus m | n. sp. Akbes [hw, Reitter’s hand] || Typus [p, red label] || jkF720329 || VIO || Bolbelasmus | nireus Rtrr. || det. J. Krikken 197[p]2[hw, Krikken’s hand] || Bolbelasmus nireus | (Reitter, 1895) | D. Krl & D. Sommer det. 2019 [p]”.

**Additional material examined.** **Greece, Rhodes:** 1 ♂ (LSCN), 1 ♂ (OHCB) (Figs. 1C, 2C, 3C, 4D, 5C), Lindos, 36°05’32”N 28°05’06”E, 16.iv.2017, L. Schmidt lgt.; 1 ♂ (OHCB), Lalyssos, 36°25’01.09”N 28°08’44.03”E, 28.iii.2017, R. Dietze lgt.; **Syria:** 1 ♀ (MNHN), Akbs, [without date], [E.] Reitter; **Turkey:** 1 ♀ (OHCB), Side, 27.iv.1973, K. Warncke lgt.; 1 ♀ (NMPC), Korkuteli, 11.vi.1991, B. Nmec lgt.; 1 ♂ (JMCP), el, amlıyayla, Sebil, 24.–26.v.1995, J. Mika lgt.; 1 ♀ (NMPC), 20 km S of Kemer, v.2001, [without collector’s name]; 1 ♂ (AHCB) (Figs. 1D, 2D, 3D), NW of Alanya, NE of Manavgat, 8.iv.2015, M. Snzek lgt.; 2 ♂♂ (MNHN), Adana [without date and collector’s name].

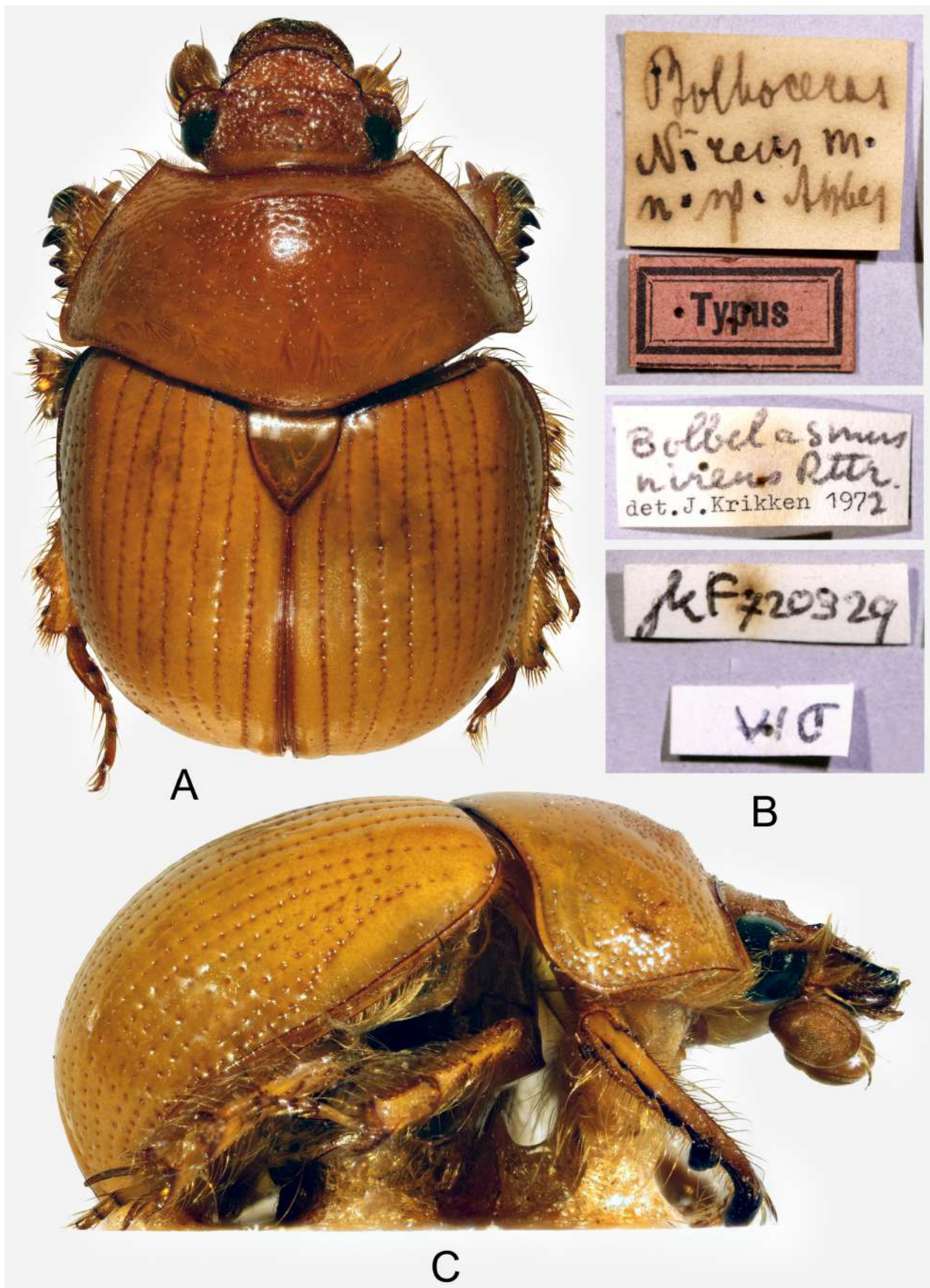
**Disribution.** Iraq, Syria and Turkey (Nikolajev *et al.* 2016). New country record for Greece (island of Rhodes) (see map, Fig. 9). The record of the species *B. (B.) unicornis* (Schrnk, 1789) from the island of Rhodes by Schatzmayr (1936) most likely relates to the species *B. (B.) nireus*.

**Note.** The distribution in Iraq is based on a single female specimen from Assur tentatively assigned to this species by Krikken (1977). We have not studied this specimen, so we cannot confirm with certainty what species it belongs to. In addition, this Iraqi locality of the species is very far from its distribution in Turkey (see map, Fig. 9). Their distribution in Syria is based on two females (including the holotype) collected at “Akbes”. This locality, nowadays a small village Maydn Akbis belongs to the territory of Syria (Aleppo Governorate) and is situated very close to the border with Turkey (see map, Fig. 9). Between 1881–1926 there was the Trappist monastery “Abbaye d’Akbes” (Le Bras *et al.* 1979). The site is not in modern Turkey, as stated in some papers, see Kryřtufk *et al.* (2001), Keith (2005) or Arnone & Massa (2010).



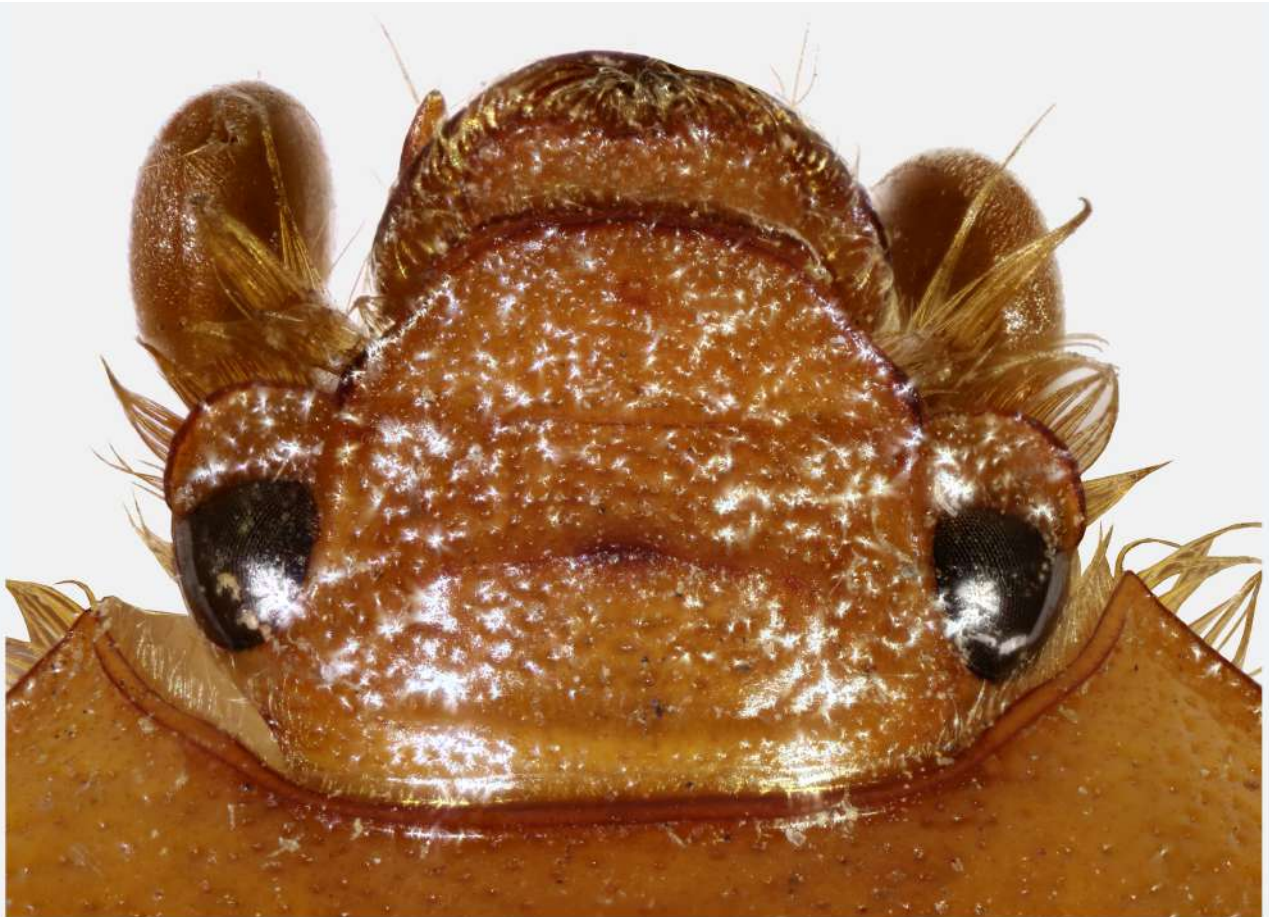
**FIGURE 6A–C.** Allotype of *Bolbelasmus zagrosensis* Sommer, Hillert, Hrůzová & Král, **new species**. A, habitus in dorsal view; B, habitus in lateral view; C, pronotum in dorsal view. Not to scale.





**FIGURE 7A–C.** Holotype of *Bolbelasmus nireus* (Reitter, 1895). A, habitus in dorsal view; B, original labels of holotype; C, habitus in lateral view. Not to scale.





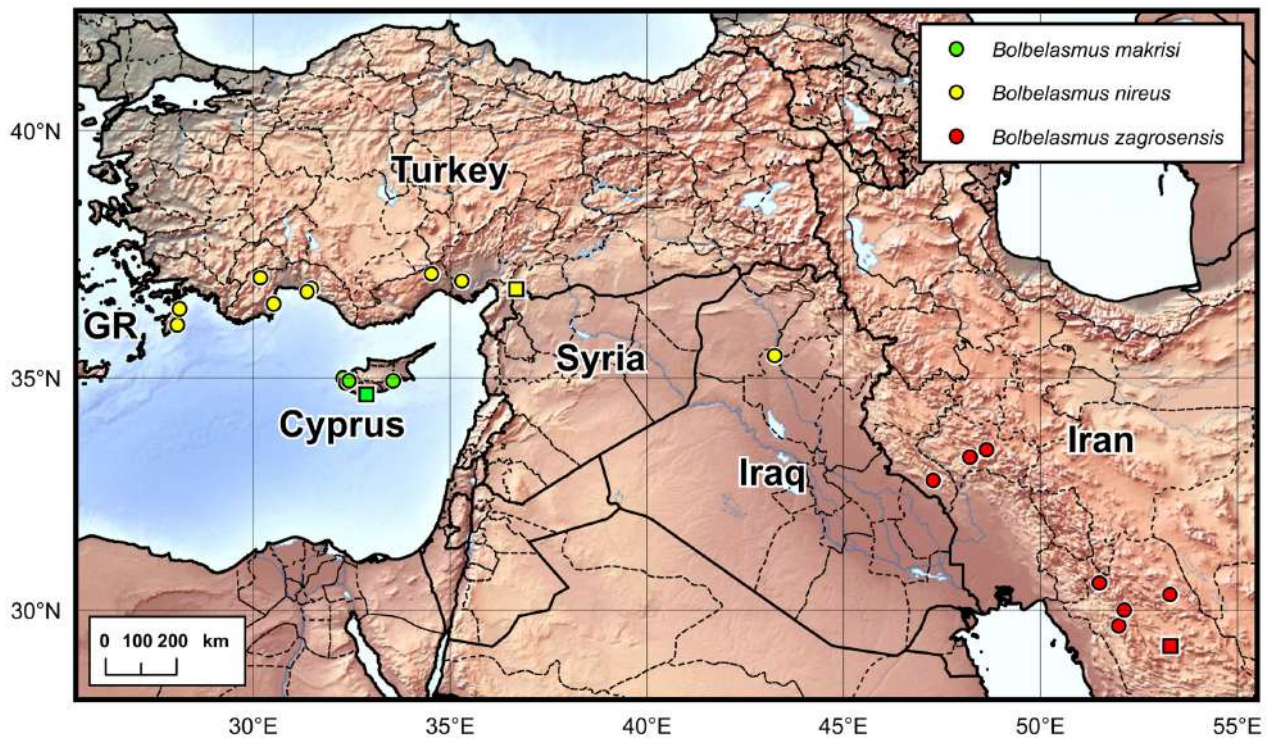
A



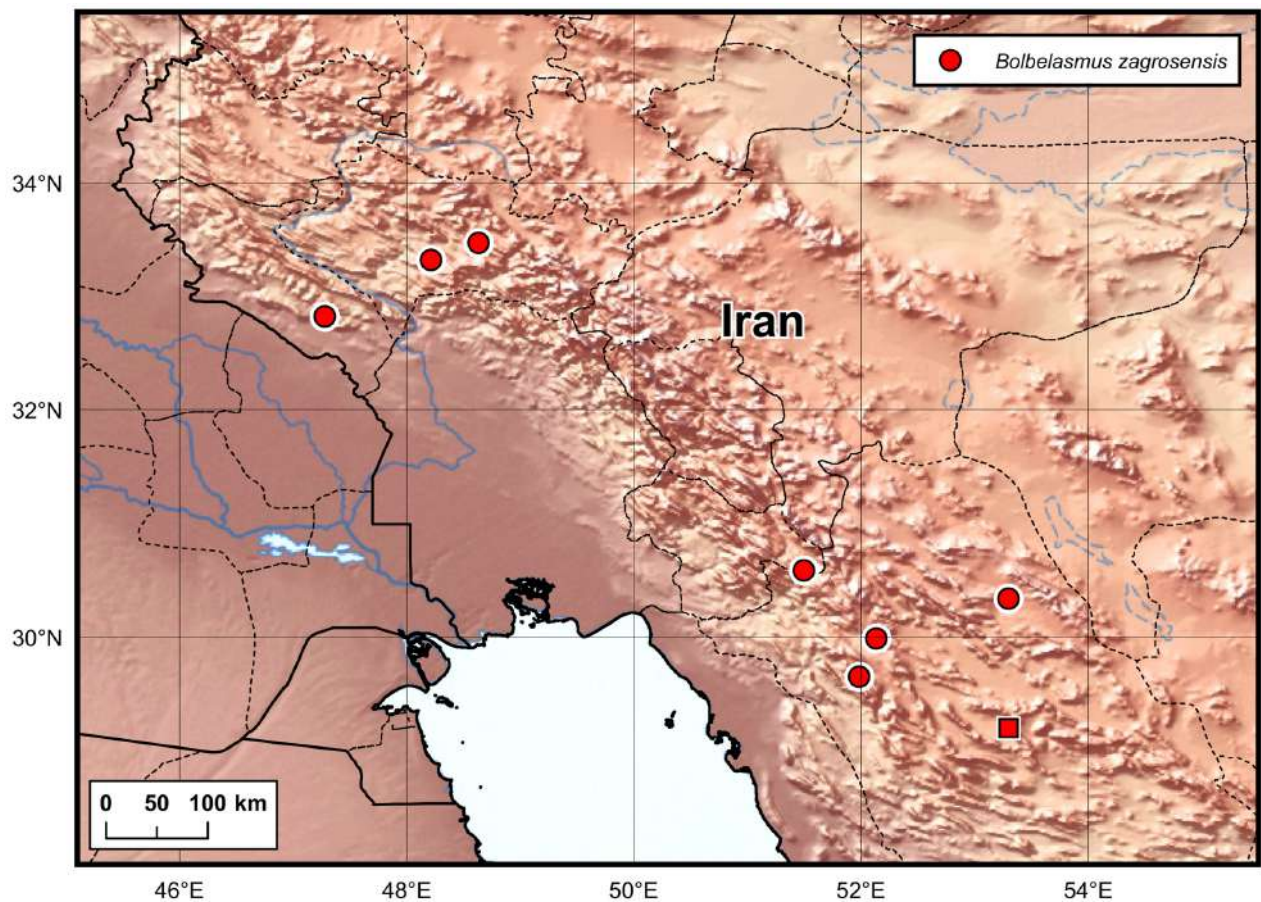
B

**FIGURE 8A–B.** Holotype of *Bolbelasmus nireus* (Reitter, 1895). A, head in dorsal view; B, pronotum in frontal view. Not to scale.





**FIGURE 9.** Sketch map with marked distribution of *Bolbelasmus makrissi* Miessen, 2011 (green), *B. nireus* (Reitter, 1895) (yellow) and *B. zagrosensis* Sommer, Hillert, Hrůzová & Král, **new species** (red). Squares represents the type locality of each species.



**FIGURE 10.** Sketch map of Iran with marked distribution of *Bolbelasmus zagrosensis* Sommer, Hillert, Hrůzová & Král, **new species**. Red square represents the type locality.



## Taxonomy

### *Bolbelasmus (Bolbelasmus) zagrosensis* Sommer, Hillert, Hrušová & Král, new species

(Figs. 1A, 2A, 3A, 4A–B, 5A, 6A–C, 9, 10)

*Bolbelasmus nireus*: Keith 2005: 51, fig. 1 (distribution); Montreuil 2017: 260 (distribution).

*Bolbelasmus nireus* [partim, populations from Iran]: Arnone & Massa 2010: 412 (distribution); Miessen 2011: 110 (distribution); Hillert *et al.* 2016: 246 (distribution); Nikolajev *et al.* 2016: 33 (catalogue); Schoolmeesters 2020 (online catalogue).

## Published records

(shown in the maps in Figs. 9–10).

Keith (2005), repeated by Arnone & Massa (2010) and Hillert *et al.* (2016): Fars Province: “Fars Prov., Pass 140 km NE of Shiraz”, see also Type material below.

Miessen (2011): Ilam Province: “Aivan-i-Kerkha, alt. 1200 m, Chaldée Persane”, see also Additional material below.

Montreuil (2017): Fars Province: “Kazerun, Chahchenar”, see also Type material below.

**Type locality.** Iran, Fars Province, 9 km SE of Sarvestan, 29°12'42.4"N 53°18'41.9"E, 1770 m.

**Type material** (57 specimens). **Iran, Fars Province: Holotype**, ♂ (NMPC) (Figs. 1A, 2A, 3A), “IRAN, Fârs prov., light trap | 9km SE of Sarvestan, 1770 m | 29°12'42.4"N, 53°18'41.9"E | L. Dembický leg., 4.V.2019 [p]”. **Paratypes: allotype**, ♀ (NMPC) (Fig. 6A–C), **paratypes**, 4 ♂♂ 2 ♀♀ (LDCB), same data as holotype; 1 ♂ 3 ♀♀ (AHCB), 1 ♀ (SJCP), 1 ♀ (OHCB), “IRAN, Fârs prov., light trap | 9km SE of Sarvestan, 1770 m | 29°12'42"N, 53°18'41"E | O. Šauša leg., 4.V.2019 [p]”; 3 ♂♂ 6 ♀♀ (ZKCP), 2 ♂♂ 1 ♀ (DSLH), 2 ♀♀ (NMPC), “IR - Fârs prov. | light trap 9km SE | of Sarvestan 1770m | 29°12'42.4"N, 53°18'41.9"E | Zd. Košťál lgt. 4.V.2019 [p]”; 2 ♂♂ 2 ♀♀ (GMCL), “9 km SE Sarvestan | 29°12'42.4"N, 53°18'41.9"E | Fars—IRAN—light trap | 4.V.2019—alt.: 1770 m | leg. & vendit: Zd. Košťál [p]”; 1 ♂ (ZKCP), “IR - prov. Fârs 26.V.2015 | 58 km NW of Šírâz | 2 km W of Sangar 2194 m | 29°59'37.08"N 52°07'56.64"E | Z. Košťál lgt. [p]”; 1 ♂ (NMPC), “Iran, Fars | Dasht-e-Arzhan | 1.v.[19]96 [M.] Hradský lgt. [hw]”; 1 ♀ (NMPC), “S IRAN, prov. Fârs | pass 140km NE Ďîrââz | 20.–21.IV.2002 | lgt. S. Kadlec [p]”; 1 ♂ (JSCP) (Figs. 4A, 5A), 1 ♀ (DKCB), “Iran, Fars prov. | Jasuj, Sangar env. | 3.-5.5.2016, 2100 m | D. Kopr. M. Obořil & M. Škorpík lgt. [p]”; 1 ♂ 1 ♀ (JSCP), 1 ♂ (OMCF), 1 ♂ (HMIM), “FARS | Kazerun—Chah chenar | 18/21.5.1976 | Abal L.T. [lgt] [p]”; 1 ♀ (HMIM), “FARS/KAZERUN | Chah chenar | 11.-13.5.1975 | L.T. Abal [lgt.] [p]”. **Kohgiluyeh & Boyer-Ahmad Province:** 1 ♀ (GMCL), 1 ♀ (OMCF), “6 km S.W. Yasuj | N30.592222 E51.508610 | Kohkiluyeh o Buyer Ahmad | IRAN—alt.: 2075 m | 27.V-I.VI.2018 | leg. & ex coll.: S. Vassel [p]”. **Lorestan Province:** 1 ♂ 1 ♀ (DSLH), 1 ♂ (NMPC), 1 ♂ 1 ♀ (OHCB) (Figs. 4B), “Iran, Lorestan province | Khoram-Abad env., 30 km | South of City, Road of Ahvaz | 30.III.2018 | S. Azadbakhsh [lgt.] [p]”; 1 ♀ (DSLH) “IRAN—Lorestan prov. | 33°21'27.40"N 48°09'29.41"E | 23km SW Choramabad | 24. 5. 2017, 1500–1650m | D. Navrátil lgt. [p]”; 1 ♀ (DNCL) “same data || *Bolbelasmus nireus* | (Reitter, 1895) | det. V. Kubáň 2017 [p]”; 1 ♂ (JZCJ) “IRAN, 24.v.2017 | Lorestan prov. | Choramabad | 1500–1650 m | N33°21'27.40" | E48°09'29.41" | Milan Rozsival lgt. [p] || coll. Jaroslav Žák | Jezernice 120 [p]”; 1 ♀ (KHCB) “W IRAN, Lorestan prov. 1700m | 20 km SW Choramabad | 7.VI.2018 33°19' 48°13' | K. Hodek leg. [p]”; 1 ♂ (LKCC) “IRAN 2018 || IR 31/K 40 W IRAN | Lorestan prov., 1700 m | 20 km SW Choramabad | 33°19'25.2" 48°13'44.48" | 7.6.2018 P. Jelínek Leg. [p]”; 1 ♂ (NMPC) “IRAN • LORESTAN pr. | 30km SW Khorramabad | 1700m 21.5.2019 | Martin Mařík leg. [hw] || 33°19'24.5"N | 48°13'44.7"E | flying 0,5 above gr. | 20.50 IRAN TIME [hw]”; 1 ♂ (MMCP) “same data || 33°19'24.5"N | 48°13'44.7"E | sitting 2m from | light trap | 22.50 IRAN TIME [hw]”; 1 ♂ (OBCL), “SW. Iran. Lorestan Pv. | Khorramabad area | Kumaz vil. 09.IV.2013 [hw]”.

**Additional material** (1 specimen). **Iran, Ilam Province:** 1 ♀ (MNHN), Chaldée Persane, Aivan-i-Kerkha [see Note below], alt. 1200 m, 1904, J. D. Morgan lgt.

**Description. Male (holotype ♂)** (Figs. 1A, 2A, 3A). *Body.* Remarkably convex, surface brown, shiny, pronotum covered with punctation double in size, elytral surface microsculptured to smooth apically.

*Head* (Figs. 1A, 2A, 3A). Clypeus broadly rounded, nearly semicircular, anterior angles vague. Posterior angles of clypeal margin elevated. Frontal horn very weakly developed, short, simple, conical, weakly spaced from fronto-clypeal carina (viewed from above), directed up- or weakly backwards. Punctation of clypeal disc simple, distinct. Oblique keels above eyes reaching to approximately posterior part of eyes. Punctation of front and vertex same as on clypeus; fronto-clypeal suture present. Eye cantus regularly rounded and almost not exceeding eye laterally.

*Pronotum* (Figs. 1A, 2A, 3A, 4A–B) distinctly transverse; broadest just at basal quarter, bordered except of interruption laterally of scutellum, lateral margin broadly rounded, regularly bent from anterior angle to middle, anterior corners of pronotum distinctly acuminate, marginal carina not crenate, distinctly widened and elevated; lateral fovea almost missing. Pronotal punctation distinct, double in size, punctures coarse, separated less than diameter of puncture, intermixed with considerably fine, sparse punctures. Lateral hornlike apophyses weakly tuberculate. Apical hornlike apophysis weakly elevated, joined in keel-like seam.

*Scutellum* triangular, acuminate apically, finely punctate, shiny.

*Elytra* (Figs. 1A, 3A) approximately as long as wide, surface shiny, glabrous; seven distinct striae between suture and humerus along entire elytral length, all striae with distinctly confluent punctures; intervals convex; humeral umbone weak.

*Ventral side.* Surface brown, shiny with long yellow-brown setae.

*Legs* (Fig. 1A). Protibia with seven external denticles, terminal spur acuminate, reaching end of protarsomere II.

*Aedeagus.* Parameres as in Fig. 5A.

**Variability in males.** Surface pale to dark brown; pronotal hornlike apophyses in moderately developed and poorly developed (hypothelic) specimens short, more or less straight, tips rounded to acute.

**Female (allotype ♀)** (Fig. 6A–C). *Head* (Fig. 6A–C). Clypeus broadly rounded, nearly semicircular, anterior angles vague. Posterior angles of clypeal margin very weakly elevated. Frontal carina tuberculate, well developed, not interrupted. Punctuation of clypeus, frons, vertex and occiput simple, distinct; oblique keels above eyes distinct, elongated to posterior part of eyes; eyes well developed, nearly rounded, genae well developed, evenly rounded and distinct, extending laterally.

*Pronotum* (Fig. 6A–C) distinctly transverse, lateral margin weakly widened, broadest basally, surface deeply punctate, except of basal part double in size, punctures coarse, separated less than diameter of puncture, intermixed with fine, pinned punctures. Anterior transverse protrusion distinct, sharply semicircular, emarginated in middle, lateral apophyses present, almost invisible.

*Elytra* (Fig. 6A–B). Surface shiny, glabrous; humeral umbone weak.

**Variability in females.** Smaller females with less noticeable anterior transverse protrusion.

**Measurements.** Body length 10.5–12.2 mm (holotype, ♂: 11.5 mm; allotype ♀: 12.0 mm).

**Differential diagnosis.** Refer to species key below. Females and small undeveloped males are morphologically practically indeterminate.

**Collecting method.** Most type specimens were collected at light trap.

**Etymology.** The specific name “*zagrosensis*” refers to the type locality of the new species, Zagros Mts. in Iran.

**Distribution.** Western Iran (see map, Figs. 9–10).

**Note.** The distribution in Ilam province is based on a single female specimen (not included in the type series) from the locality “Chaldée Persane, Aivan-i-Kerkha” close to the “Kabir Kouh” mountains north of Dehloran, see Théry (1925) and Ghahari *et al.* (2015) for details.

## Key to the subgenus *Bolbelasmus* species from the western Palearctic Region

(modified from Hillert *et al.* 2016)

1. Posterior margin of pronotum incompletely bordered, interrupted laterally of scutellum. .... 2
- Posterior margin of pronotum completely bordered. .... 6
2. Lateral margin of pronotum nearly semicircular between anterior angles and midline in dorsal view, anterior angles almost rounded; frontal horn and medial hornlike apophysis of pronotum distinct; scutellum triangular, approximately as long as wide; body length 11.0–13.5 mm; southern parts of central Europe, France (Alsace), Italy, Balkan Peninsula, Poland, Russia and Ukraine; Asian part of Turkey ..... *B. (B.) unicornis* (Schränk von Paula, 1789)
- Lateral margin of pronotum broadly rounded, regularly bent from anterior angle to middle, anterior corners of pronotum distinctly acuminate, lateral margin straight in front of anterior angles; frontal horn and medial hornlike apophysis of pronotum always indistinct; scutellum triangular, longer than wide; body length 9.5–12.0 mm; Cyprus, Greece (Rhodes), Iran, Iraq, Syria and Turkey. .... 3
3. Eye cantus weakly acuminate and distinctly exceeding eye laterally; scutellum rounded apically; Asian part of Turkey. ....
- Eye cantus regularly rounded and not exceeding eye laterally; scutellum acuminate apically. .... *B. (B.) tauricus* Petrovitz, 1973

4. Frontal horn weakly spaced from fronto-clypeal carina (viewed from above), pronotal punctation double and dense, small punctures sparser; frontal horn directed upwards to weakly backwards (Figs. 3A, 3C–D, 4A–B, 4D). . . . . 5
- Frontal horn close to fronto-clypeal carina (viewed from above); pronotal punctation double and dense, small punctures denser; frontal horn directed obliquely forwards (Figs. 3B, 4C); aedeagus as in Fig. 5B; Cyprus. . . . . *B. (B.) makrasi* Miessen, 2011
5. Border of posterior margin of pronotum weakly interrupted laterobasally, but with only several single punctures; frontal horn directed weakly backwards (Figs. 3C–D, 4D); aedeagus as in Fig. 5C; Greece (Rhodes), Iraq, Syria and Asian part of Turkey. . . . . *B. (B.) nireus* (Reitter, 1895)
- Border of posterior margin of pronotum distinctly interrupted laterobasally, single punctures absent; frontal horn directed upwards (Figs. 3A, 4A–B); aedeagus as in Fig. 5A; Iran. . . . . *B. (B.) zagrosensis* Sommer, Hillert, Hrůzová & Král, **new species**
6. Scutellum impunctate or finely, shallowly punctate; frontal horn simple or furcate apically. . . . . 7
- Scutellum densely punctate; apex of frontal horn simple. . . . . 11
7. Frontal horn simple; genae evenly rounded; oblique keel above eye longer than length of eye; head strongly constricted behind eye. . . . . 8
- Frontal horn furcate apically; genae more or less angulate anterolaterally; oblique keel above eye reaching to anterior part of eye; head not strongly constricted behind eye. . . . . 9
8. Body surface blackish; pronotal punctation dense and distinct, separated by distance of 1–2 punctures combined; Algeria, Italy (Sicily) and Tunisia. . . . . *B. (B.) vaulogeri* (Abeille de Perrin, 1898)
- Body surface brownish; pronotal punctation sparse but distinct, separated by distance of 3–4 punctures combined; Greece (Crete, Kasos). . . . . *B. (B.) keithi* Miessen & Trichas, 2011
9. Frontal horn short (not longer than wide), apex of horn approximately as wide as base of horn; pronotal punctation denser with exception of basal part, puncture separated by diameter of puncture; pronotal base with fine and regularly spaced punctures, punctures in shape of pinned points; elytral striae well impressed, completely developed; elytral intervals moderately convex; Spain. . . . . *B. (B.) brancoi* Hillert & Král, 2016
- Frontal horn long (longer than wide), tapering apically; pronotal punctation sparser, puncture separated approximately by three their diameters; pronotal base with fine, poorly visible and well separated punctures, punctures in shape of pinned points; elytral striae not impressed, punctures in row visible; elytral intervals flat; northern Africa. . . . . 10
10. Frontal horn parallel to anterior part of eyes; horn sharply keeled at basal half; middle hornlike apophysis of pronotum directed upwards, subapical protrusion situated basally; lateral hornlike apophyses of pronotum directed forwards; Algeria and Morocco. . . . . *B. (B.) bocchus* (Erichson, 1841)
- Base of frontal horn parallel to level of posterior part of eyes; horn broadly keeled apically; middle hornlike apophysis of pronotum directed obliquely, subapical protrusion situated at apex; lateral hornlike apophyses of pronotum directed forwardly; Egypt, Libya and Tunisia. . . . . *B. (B.) nikolajevi* Hillert, Arnone, Král & Massa, 2016
11. Apex of frontal horn tapering apically, acute, weakly flattened in anterior part of horn; Spain and Gibraltar. . . . . *B. (B.) howdeni* Hillert & Král, 2016
- Apex of frontal horn roughly as wide as base, apex broadly acute, strongly flattened in anterior part of horn; France (including Corsica), Portugal and Spain. . . . . *B. (B.) gallicus* (Mulsant, 1842)

**Note.** Recently described species *B. (B.) casanovaorum* López-Colón & Bahillo de la Puebla, 2016 is not included in the key because the authors did not have any study material available. The species, so far known only from the holotype, is compared in the original description with *B. (B.) gallicus* and *B. (B.) howdeni* (see López-Colón & Bahillo de la Puebla, 2016: 269, figs. 1–9 for details).

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