

A Review of the Genus *Gnaptor* Brullé, 1832 (Coleoptera, Tenebrionidae) with Description of a New Species from Turkey

I. A. Chigray^a, M. V. Nabozhenko^{a, b}, B. Keskin^c

^aSouthern Federal University, Department of Zoology, Rostov-on-Don, 344090 Russia
e-mail: chigray93@bk.ru

^bInstitute of Arid Zones, Southern Scientific Centre, Russian Academy of Sciences, Rostov-on-Don, 344090 Russia
e-mail: nalassus@mail.ru

^cEge University, Zoology Department, Bornova–Izmir, 35100 Turkey
e-mail: bekir.keskin@ege.edu.tr

Received December 14, 2014

Abstract—The new species *Gnaptor medvedevi* sp. n. is described from southwestern Turkey. The new species is closely related to *G. spinimanus* but differs from it in narrower parameres, in the structure of the spiculum gastrale, and in the sculpture of the prothoracic hypomera. The new monotypical subgenus *Plesiognaptor* subgen. n. is described for *G. prolixus*; the distribution of each species is described. New data on the range of *G. prolixus* are added. This species is known from Turkey (Izmir, Aydın, Afyon, Konya, and Isparta provinces) and Iran (Elburs, the first record for the country). A key to and illustrations for all the species of the genus *Gnaptor* are given.

DOI: 10.1134/S001387381508001X

Gnaptor Brullé, 1832, the only genus in the subtribe Gnaptorina G. Medvedev, 2001 (the tribe Blaptini), includes several species distributed in the Western Palaearctic Region from Central Europe (Austria, Slovenia) to the Don River. Skopin (1960), based on the structure of the larvae, though noting their distinctiveness, attributed the genus *Gnaptor* to the subtribe Prosodina. Having taken Skopin's study into consideration, Medvedev (2001) used a wide set of characters of the structure of the ovipositor and genital tubes of the female and the genitalia and terminalia of the male to establish the tribe Gnaptorina for the genus *Gnaptor*. He also pointed at essential morphological differences between two species of the genus, *G. spinimanus* (Pallas, 1781) and *G. prolixus* Fairmaire, 1866. "The characters of *G. prolixus* are less advanced in comparison with those in *G. spinimanus*, which is caused either by remoteness of the time of separation of these two species or by higher rates of the evolutionary transformations" in the latter species (Medvedev, 2001 : 30–31). These arguments allow separation of *G. prolixus* into a monotypical subgenus *Plesiognaptor* subgen. n.

Until recently, only two species of the genus *Gnaptor* were known: *G. spinimanus* (Pallas, 1781) widely distributed in Europe, and *G. prolixus* Fairmaire, 1866 locally distributed in Anatolia. Martínez et al. (2011) resurrected the validity of *G. boryi* Laporte, 1840 from Greece and synonymized with it *G. graecus* Küster, 1848. *Gnaptor boryi* is closely related to *G. spinimanus* but differs in considerably wider and more strongly S-curved parameres.

During the expeditionary studies in the western part of the Taurus Mts. (Turkey), three isolated populations of another species of the genus *Gnaptor* were found; this species is closely related to *G. spinimanus* but differs in narrower parameres. The genital tubes in the new species and in the two known species of the monotypical subgenus are similar and characterized by a very long basal spermathecal duct (the area from the apex of the vagina to the first reservoir) which is 6–7 times longer than the body of the beetle. The body of *G. prolixus* is tens of times as long as the basal duct.

Material from the following depositaries and collections (the acronyms are given in parentheses) is used in the study: the Zoological Institute of the Russian

Academy of Sciences (ZIN, St. Petersburg, Russia), the Finnish Museum of Natural History (FMNH, University of Helsinki, Finland), Zoological Department of Ege University (ZDEU, Bornova–İzmir, Turkey), and M.V. Nabozhenko's collection (CN, Rostov-on-Don, Russia).

Genus *GNAPTOR* Brullé, 1832

Subgenus *Plesiognaptor*

Chigray, Nabozhenko et Keskin, subgen. n.

Type species *Gnaptor prolixus* Fairmaire, 1866.

Diagnosis. Body of male rather slender; legs long, slender. Elytral apex strongly elongate, clearly visible in dorsal view. Hind leg of male noticeably curved. 1st and 2nd protarsomeres with dense hair brush over entire sole surface; 3rd and 4th protarsomeres with dense hair brush of anterior margin of soil surface. Hypomera of prothorax with coarse wrinkles over entire surface; its outer margin with wide edging distinctly separated from rest of surface. Parameres strongly elongate, split only apically, straight (not S-curved) in lateral view. Spiculum gastrale with distinct common stem. Gland of sternite VIII of male very fine and short. Female genital tubes: bases of spermathecal reservoirs and sphincter of gland adjacent; reservoirs not separated from each other by long spermathecal duct. Length of basal spermathecal duct constituting a few percent of body length of female.

Etymology: The name is derived from the Greek word *plēsí* (os), which means “near, close to.”

Gnaptor (Plesiognaptor) prolixus Fairmaire, 1866
(Figs. 1a; 2a, 2b)

Material. Turkey: “Anatolia, Asia Minor, v. Bodemeyer,” 1 ♂, 1 ♀ (FMNH); “Asia minor, Ak-Chehir v. Bodemeyer,” 1 spm. (ZIN); “Anatolien, Ak-Chehir, 1900 Korb,” 1 spm. (ZIN); “Asia Minor, Bos-Dagh,” 2 spms. (ZIN); “Bosdagh, 68 Lederer,” 1 spm. (ZIN). İzmir Province, Bozdağ, 02.VII.1964, 4 ♂, 2 ♀ (ZDEU), 12.VII.1965 (leg. N. Oktem), 3 ♂ (ZDEU), 12.V.2001, 1 ♀ (ZDEU), 09.V.2006 (leg. H. Yılmaz), 1 ♂ (ZDEU), 09.V.2006 (leg. M.A. Alcan), 1 ♂, 1 ♀ (ZDEU), 09.V.2006 (leg. G. Mulla), 2 ♀ (ZDEU), 09.V.2006 (leg. S. Sertkol), 1 (ZDEU); İzmir Province, Bozdağ, 29.III.2003, N 38°18'6.25"N, 28°2'15.06"E, 1190 m (leg. B. Keskin), 1 ♂, 1 ♀ (ZDEU); İzmir Province, Bozdağ, 30.IV.2003, 38°18'12.62"N, 28°2'37.84"E, 1260 m (leg. B. Keskin), 1 ♂ (ZDEU). Afyon Province, Sultandağ,

21.V.1966, 1 ♂ (ZDEU). Afyon Province, Cumhuriyet, 13.V.2004 (leg. H. Koc), 1 ♀ (ZDEU). Isparta Province, Davraz Dağı, 37°47.827'N, 30°45.505'E, 1603–1650 m, 11.V.2009 (leg. M.V. and S.V. Nabozhenko, B. Keskin), 2 ♂ (ZIN, CN). Konya Province, Kızılören, 05.2011 (leg. I. Shokhin), 1 ♂, 1 ♀ (CN). **Iran:** “Elbrus [Elburs] Geb. Persien, Rettr.,” 2 ♂ (FMNH).

Distribution. Iran: Elburs. Turkey: İzmir (İzmir: Bozdağ—type locality), Afyon, Aydın (Aydın: Madran), Konya (in addition to the material examined: Höyük), and Isparta provinces (Medvedev, 2001; Mercan et al., 2004; Tezcan et al., 2004; Martínez et al., 2011). The record for Tekirdağ, the European part of Turkey (Tezcan et al., 2004) is erroneous and refers to *G. spinimanus*.

Subgenus *Gnaptor* Brullé, 1832

Type species *Tenebrio spinimanus* Pallas, 1781, by monotypy.

Gnaptor (s. str.) *spinimanus* (Pallas, 1781)
(Figs. 1b; 2c, 2d, 2i)

Material. Over 300 specimens from Russia, Eastern and Southern Europe (ZIN, CN, ZDEU).

Distribution. Albania, Montenegro, Slovenia, Serbia, Bosnia and Herzegovina, Czech Republic, Slovakia, Austria, Hungary, Bulgaria, Romania, Macedonia, Poland, Ukraine, Moldova, Turkey (Tekirdağ Province, Edirne Province: Gala Gölü–Kesan, 23–24.IV.2005 (leg. I.E. Cevik), 2 ♂, 2 ♀ (ZDEU)), southern European Russia (Medvedev, 2001; Löbl et al., 2008; Martínez et al., 2011; Abdurakhmanov and Nabozhenko, 2011). The Don River is the eastern border of the range. More detailed data on the distribution for Ukraine are given by Chernei (2005) and Chernei and Fedorenko (2006); a detailed bibliography and distribution of the species to be found in Abdurakhmanov and Nabozhenko (2011).

In Russia, the species is distributed in the Crimea (except for moist forests), in Rostov Province (Rostov-on-Don, Nedvigovka, Aksai, Millerovskii District (Ivanovka), Avilo-Uspenka, Razdorskaya and Gornaya Cossack villages; Sholokhovskii District (Belogorskii)), Volgograd Province (the environs of Kalach-on-Don—the left bank of the Don River, Trekhostrovskaya). The species is characteristic of the herb-fescue-feather steppes with abundant bushes.

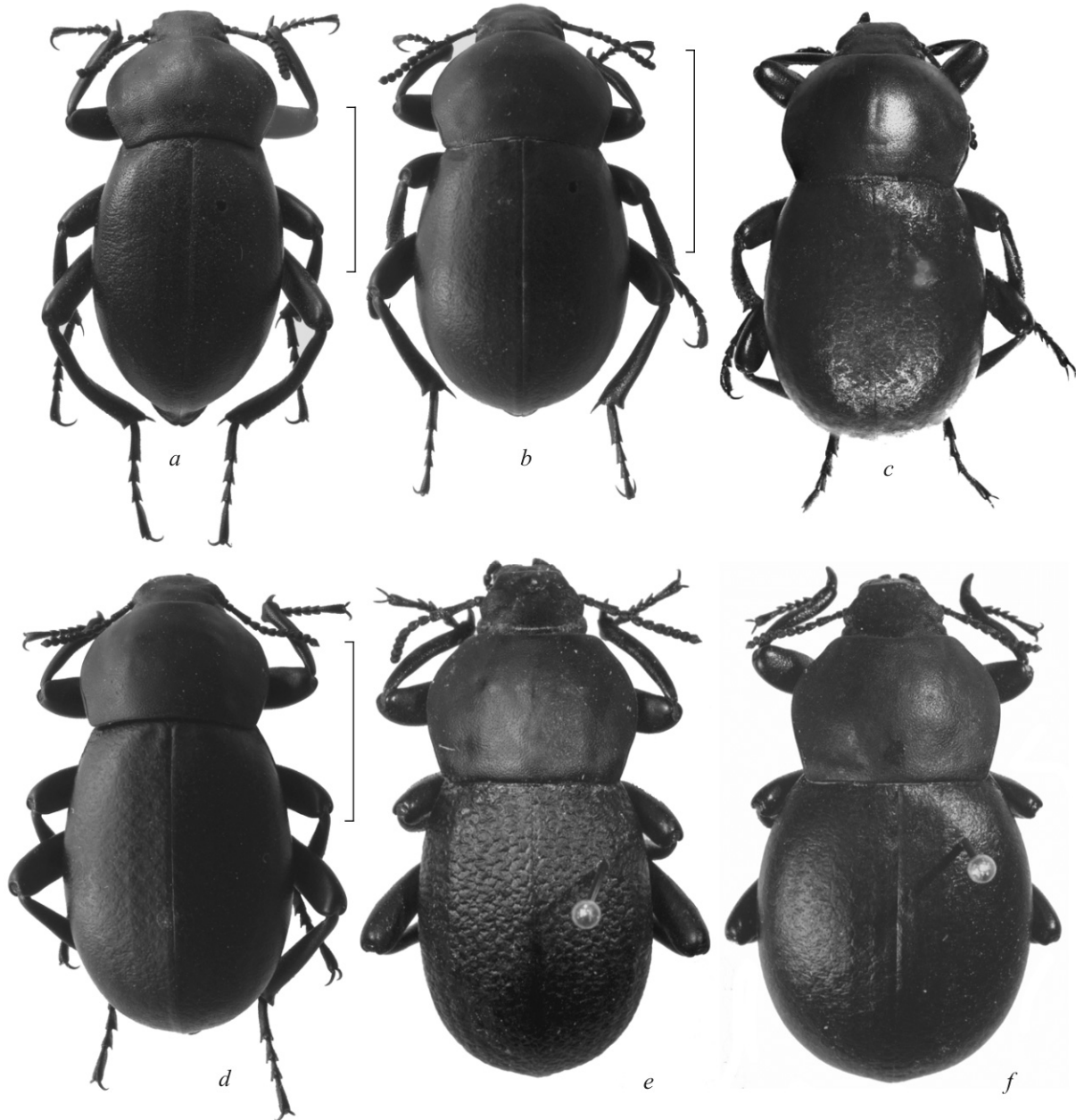


Fig. 1. *Gnaptor* sp., general view: (a) *G. prolixus*, male; (b) *G. spinimanus*, male; (c) *G. boryi*, male; (d) *G. medvedevi* sp. n., male, Konya Province; (e) *G. medvedevi* sp. n., male, Isparta Province; (f) *G. medvedevi* sp. n., female, Isparta Province.

The species is red-listed for Rostov Province (Arzanov and Nabozhenko, 2004; Nabozhenko, 2014).

Gnaptor boryi Laporte, 1840
(Figs. 1c; 2e, 2f, 2j)

Material. Greece: “Morea, Cumani, Brescke,” 2 ♂, 2 ♀ (ZIN).

The species is endemic to Greece (Peloponnese). Its distribution is given in detail by Kühnelt (1965) and Martínez et al. (2011).

Gnaptor medvedevi Chigray,
Nabozhenko et Keskin, sp. n.
(Figs. 1d–1f; 2g, 2h, 2k)

Material. Holotype (♂) and 1 paratype (♀) in the ZIN collection with label: “Turkey, Konya Province, 18 km N Yarpuz, 37°12.890'N, 31°58.955'E, 1804 m, 16.V.2009. Leg. M.V. & S.V. Nabozhenko, B. Keskin.” Paratypes: “Turkey, Antalya Province, Akseki District, pass above Yarpuz 37°10.246'N, 31°55.324'E, 1821 m, 15.V.2009 (leg. M.V. &



Fig. 2. Genus *Gnaptor*, structure of males: (a, b) *G. prolixus*; (c, d, i) *G. spinimanus*; (e, f, j) *G. boryi*; (g, h, k) *G. medvedevi* sp. n. [(a–h) parameres, dorsal and ventral view; (i–k) spiculum gastrale].

S.V. Nabozhenko, B. Keskin,” 1 ♀ (ZIN), 1 ♂ and 2 ♀ (ZDEU); “Turkey, Isparta Province, pass between Yenişar and Aksu, 37°43.437’N, 31°18.549’E, 1777 m, 14.V.2009 (leg. M.V. & S.V. Nabozhenko, B. Keskin),” 1 ♂, 3 ♀ (ZIN), 2 ♂ and 3 ♀ (ZDEU).

Description. Male. Body black, matte, large, wide-oval, robust. Head widest at level of eyes. Distance between eyes 9 times as long as eyes. Anterior margin of clypeus weakly arcuately concave. Small

obtuse emargination situated at joint of clypeus and gena. Gena emarginate in anterior part, widely rounded in posterior part. Punctuation of head rather delicate, moderately dense. Antennal ultimate segment reaching middle of pronotum. 7–10th antennal segments wider than long. Ratio of length (width) of 2nd–11th antennal segments 8(9) : 25(11) : 15(11) : 11(11) : 11(11) : 12(13) : 10(13) : 10(13) : 9(13) : 12(12).

Pronotum transverse (1.42 times as wide as long), widest at midlength (1.88 times as wide there as head). Ratio of width of pronotum at level of anterior margin to that in middle and to that at base 1.0 : 1.8 : 1.5. Sides of pronotum rounded; anterior margin widely concave; base nearly straight. Anterior and posterior angles of pronotum narrowly rounded, obtuse. Lateral margins of pronotum finely bordered; anterior margin bordered only near anterior angles; posterior margin not bordered. Pronotal disc weakly convex. Hypomera with coarse wrinkles, without rasp-shaped punctation, occasionally with sparse rasp-shaped punctation, bordered and less densely granulate in anterior part. Prosternal process between fore coxae with deep median depression; posterior end of process with short tooth.

Elytra gently sloping toward sides and apex, oblong-oval (1.51 times as long as wide), widest at midlength (1.12 times as wide and 2.35 times as long as pronotum, 2.15 times as wide as head), convex. Elytral apex weakly attenuate. Epipleura wrinkled.

Abdominal ventrites I–III entirely wrinkled; ventrite IV wrinkled only at anterior margin. Punctuation on all ventrites rather delicate and rather sparse.

Femur to tibia and to tarsus length ratio: 13 : 12 : 10 for fore leg, 16 : 13 : 12 for middle leg, and 19 : 18 : 16 for hind leg. Fore tibia S-curved, with large spur bent outwards and with small spur bent inwards. Middle tibia weakly curved; hind tibia straight. 1st and 2nd segments of fore tarsus ventrally with entire brush at anterior margin; 3rd and 4th segments with brush interrupted medially.

Length of aedeagus 8.5 mm, width 1.8–1.9 mm. Length of parameres 3 mm. Parameres regularly narrowed apically, fork-shaped, S-curved laterally. Sternite VIII of male covered with small setae densest in its apical part, with medial part shallowly emarginate.

Spiculum gastrale strongly S-curved, with distinct common stem.

Body length 26–28 mm, width 11.2–12.4 mm.

Female. Body black, large, robust, more convex than that in male. Antennae short, with ultimate segment not projecting beyond middle of pronotum. 7–10th antennal segments wider than long. Ratio of length (width) of 2nd–11th antennal segments: 8(8) : 21(10) : 12(10) : 11(10) : 10(10) : 10(13) : 8(12) : 8(12) : 8(11) : 11(9).

Pronotum transverse (width 1.35 times length), widest at midlength, 1.94 times as wide there as head. Pronotal disc regularly convex, not flattened.

Elytra oval (length 1.18 times width), widest at midlength (1.56 times as wide as pronotum), convex, smooth or weakly wrinkled, with sparse punctures.

Fore tibia S-curved, with large spur bent outwards. Second small spur, characteristic of males, absent.

Body length 26–28 mm, width 13.5 mm.

Variability. In males from Isparta, elytra occasionally strongly wrinkled (Fig. 1e); in females, elytra weakly wrinkled (Fig. 1f).

Habitat. The species was collected in daytime in bushes under rocks, in light forests formed by *Juniperus excelsa* and *Cedrus libanii*.

Comparative diagnosis. The species is most closely related to *G. spinimanus* but differs in distinctly narrower parameres and in the presence of a short common stem of the spiculum gastrale. In addition, these species differ in the length of the aedeagus (5.5–6 mm in *G. spinimanus* sp. n., 8.5 mm in *G. medvedevi* sp. n.). The new species, in contrast to *G. spinimanus*, possesses a spiculum gastrale with a short but distinct common stem. For differences of these two species from *G. boryi* and *G. prolixus*, see the key below.

Etymology. The species is named after Gleb Sergeevich Medvedev.

A Key to the Species of the Genus Gnaptor

- 1 (2). Body of male slender. Elytral apex strongly elongate, clearly visible in dorsal view. Hind tibia of male curved. 1st and 2nd protarsomeres with dense hair brush over entire sole surface. Parameres of aedeagus straight, strongly narrowed apically, shortly bifurcate and not flattened there. Length of basal spermathecal duct constituting a few percent of beetle length
..... *G. prolixus*.
- 2 (1). Body of male robust. Elytral apex weakly elongate, partly visible in dorsal view. Hind tibia of male straight. 1st and 2nd protarsomeres with hair brush only in anterior part. Parameres of male S-curved, flattened dorsoventrally at apex. Basal spermathecal duct 6–7 times as long as beetle.

- 3 (4). Marginal brush of hairs bifurcate on all protarsomeres. Parameres of aedeagus very wide, 2.2 times as long as wide *G. boryi*.
- 4 (3). Marginal brush of hairs entire on 1st and 2nd protarsomeres, bifurcate on 3rd and 4th protarsomeres. Parameres of aedeagus narrower, 2.6–3.9 times as long as wide.
- 5 (6). Parameres of aedeagus 3.86–3.9 times as long as wide. Spiculum gastrale with short but distinct common stem. Hypomera usually with coarser wrinkles and with outer margin entirely bordered in anterior part *G. medvedevi* sp. n.
- 6 (5). Parameres of aedeagus 2.6–2.7 times as long as wide. Spiculum gastrale without common stem. Hypomera in populations from eastern part of range with smoothed wrinkles and with outer margin incompletely bordered in anterior part; in populations from western part of range (Albania, Montenegro), hypomera with coarse wrinkles and entire bordering *G. spinimanus*.

ACKNOWLEDGMENTS

The authors are grateful to Svetlana Nabozhenko (Institute of Arid Zones, Southern Scientific Centre, Russian Academy of Sciences, Rostov-on-Don) for her help in collecting the material, to Hans Silfverberg (Helsinki) and Mark Volkovitch (Zoological Institute, Russian Academy of Sciences, St. Petersburg) for the opportunity to examine the material collected, to Vladimir Shmatko (Institute of Arid Zones, Southern Scientific Centre, Russian Academy of Sciences, Rostov-on-Don) for making some photographs, and to Aleksei Moseyko (Zoological Institute, Russian Academy of Sciences, St. Petersburg) for information resources.

The study was financially supported by the Russian Foundation for Basic Research (grant no. 13-05-00467-a).

REFERENCES

1. Abdurakhmanov, G.M. and Nabozhenko, M.V., *A Key to and Catalog of the Darkling Beetles (Coleoptera:*

- Tenebrionidae) of the Caucasus and the South of the European Part of Russia* (KMK, Moscow, 2011) [in Russian].
2. Arzanov, Yu.G. and Nabozhenko, M.V., “*Gnaptor spinimanus*,” in *The Red Data Book of Rostov Province. Vol. 1. Endangered and Disappearing Animal Species* (Malysh, Rostov-on-Don, 2004) [in Russian].
3. Chernei, L.S., “Darkling Beetles (Coleoptera, Tenebrionidae),” in *Fauna of Ukraine. Vol. 19. Coleoptera. Issue. 10* (Naukova Dumka, Kiev, 2005) [in Russian].
4. Chernei, L.S. and Fedorenko, V.P., *A Key to the Darkling Beetles (Coleoptera, Tenebrionidae) of the Fauna of Ukraine (Adults, Larvae, Pupae)* (Kolobig, Kiev, 2006) [in Russian].
5. Kühnelt, W., *Catalogus Fauna Graeciae. Pars 1. Tenebrionidae* (Zeitschrift des griechischen Alpenvereins “To Wonu,” Athens, 1965).
6. Löbl, I., Nabozhenko, M.V., and Merkl, O., *Tribe Blaptini. Catalogue of Palaearctic Coleoptera. Vol. 5. Tenebrionoidea*, Ed. by Löbl, I. and Smetana, A. (Apollo Books, Stenstrup, 2008), pp. 219–257.
7. Martínez, H.C., Ferrer, J., and Gea, J.F.S., “Rehabilitaciyn de *Gnaptor boryi* (Laporte, 1840), buena especie, diferente de *Gnaptor spinimanus* (Pallas, 1781) (Coleoptera: Tenebrionidae, Blaptini),” *Bolet. Soc. Entomol. Aragonesa*, No. 49, 243–246 (2011).
8. Medvedev, G.S., “The Evolution and Classification of Darkling Beetles of the Tribe Blaptini (Coleoptera, Tenebrionidae),” in *Lectures in Memory of N.A. Kholodkovsky, Issue 53* (Russ. Entomol. Soc., St. Petersburg, 2001) [in Russian].
9. Mercan, T., Keskin, B., and Tezcan, S., “Bozdağ (Ödemiş, İzmir) in Tenebrionidae (Coleoptera) faunasının çukur tuzaklarla belirlenmesi üzerinde bir Araştırma,” *Ekoloji*, No. 53, 44–48 (2004).
10. Nabozhenko, M.V., “*Gnaptor spinimanus*,” in *The Red Data Book of Rostov Province. Vol. 1. Animals* (Donskoi Publ., Rostov-on-Don, 2014) [in Russian].
11. Skopin, N.G., “Contribution to the Knowledge of the Morphology and Ecology of the Larvae of the Tribe Blaptini,” *Trudy Inst. Zool. Akad. Nauk KazSSR* **11**, 36–71 (1960).
12. Tezcan, S., Karsavuran, Yu., Pehlivan, E., Keskin, B., and Ferrer, J., “Contributions to the Knowledge of the Tenebrionidae (Coleoptera) from Turkey. Part II. Opatrinae, Tenebrioninae, Adeliinae,” *Türk. Entomol. Dergisi* **28** (3), 163–180 (2004).