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NOTES ON *HOPLIA LACONIAE* PETROVITZ, A POORLY KNOWN SPECIES FROM GREECE, AND RELATED TAXA (INSECTA, COLEOPTERA, SCARABAEIDAE, MELOLONTHINAE)

Riassunto. *Note su* Hoplia laconiae *Petrovitz, una specie poco nota della Grecia, e taxa correlati (Insecta, Coleoptera, Scarabaeidae, Melolonthinae).*
Viene ridescritta e illustrata *Hoplia laconiae* Petrovitz, una specie di Grecia su cui non sono comparse altre notizie dopo la descrizione originale. Sulla base dell'esame degli esemplari tipici, viene proposta la sinonimia *Hoplia caucasica danieli* Tesař, 1969 = *H. laconiae* Petrovitz, 1958. Viene inoltre chiarito l'esatto anno di descrizione di *Hoplia herminiana* Apfelbeck.

Abstract. Redescription and illustrations are presented for *Hoplia laconiae* Petrovitz, a poorly known species from Greece for which no further data appeared after the original description. Based on the examination of type specimens, the synonymy *Hoplia caucasica danieli* Tesař, 1969 = *H. laconiae* Petrovitz, 1958 is established. The exact year of description of *Hoplia herminiana* Apfelbeck is also provided.

Keywords: Coleoptera, Scarabaeidae, *Hoplia,* Greece, new synonymy.

Introduction

The Genus *Hoplia* Illiger, 1803 counts almost 300 species widespread in the Palearctic, Oriental, Nearctic, and Neotropical regions (Lacroix, 1998; Micó et al., 2003; Smetana, 2006). Most of its diversity is concentrated in the Palearctic region, where it is one of the most diverse genera of Scarabaeidae: over 160 palearctic species are currently known, let aside subspecies. Of these, only about 40 species are present in Europe, where the taxonomic knowledge is however far from being satisfactory: even in well investigated areas, such as Italy, new species are still discovered (Leo et al., 2010) and taxonomic issues are still addressed (Ballerio et al., 2011).

Hoplia species have a flattened dorsum covered with scales and bristles of variable density, metatibiae normally lacking apical spurs, metatarsomeri without onychia and with one or two claws (if two, unequal in size). Morphological studies show the existence of feeble diagnostical characters to separate species, even in male and female genital structures (Dupuis, 2005; Carrillo-Ruiz et al., 2008; Carrillo-Ruiz & Moron, 2011).

The present paper deals with two poorly known taxa from Greece: *Hoplia laconiae* Petrovitz, 1958, and *Hoplia caucasica danieli* Tesař, 1969 which is here recognized as junior synonym of the former one.

Hoplia laconiae was shortly described by Petrovitz (1958), and his validity has never been questioned. However, this species was overlooked by Baraud, who did not include it in his monograph on European Scarabaeoidea (Baraud, 1992), as well as subsequent authors (Krell, 1993; Tauzin, 2001). No other data appeared on this species after the original description until its listing in the catalogue of palaearctic Coleoptera (Smetana, 2006). In order to

update Baraud's treatment of European *Hoplia*, we deem useful to provide a re-description of this species.

Taxonomic and nomenclatorial remarks are presented for allied species.

Material examined

The studied specimens are preserved in the following collections: collection Andrea Liberto (Roma, Italy) (AL); collection Antonio Rey (Genova, Italy) (AR); Museo Civico di Storia Naturale "Giacomo Doria" Genova (MCSNG); Museum d'Histoire Naturelle Géneve (MHNG); collection Marco Uliana (Codevigo, Italy) (MU); Naturhistorisches Museum Basel (NHMBA); Zoologische Staatssamlung München (ZSM).

Collecting data are reported as written on the original labels, our interpretations are in square brackets.

Type specimens

Hoplia (s. str.) *laconiae,* Typus ♂: [Greece] Gythion / Laconia / Peloponnes / 2. Häfte Mai 1956 / leg. L. Petrovitz, MHNG; 12 Cotypi ♂: same data of Typus, MHNG (fig. 5).

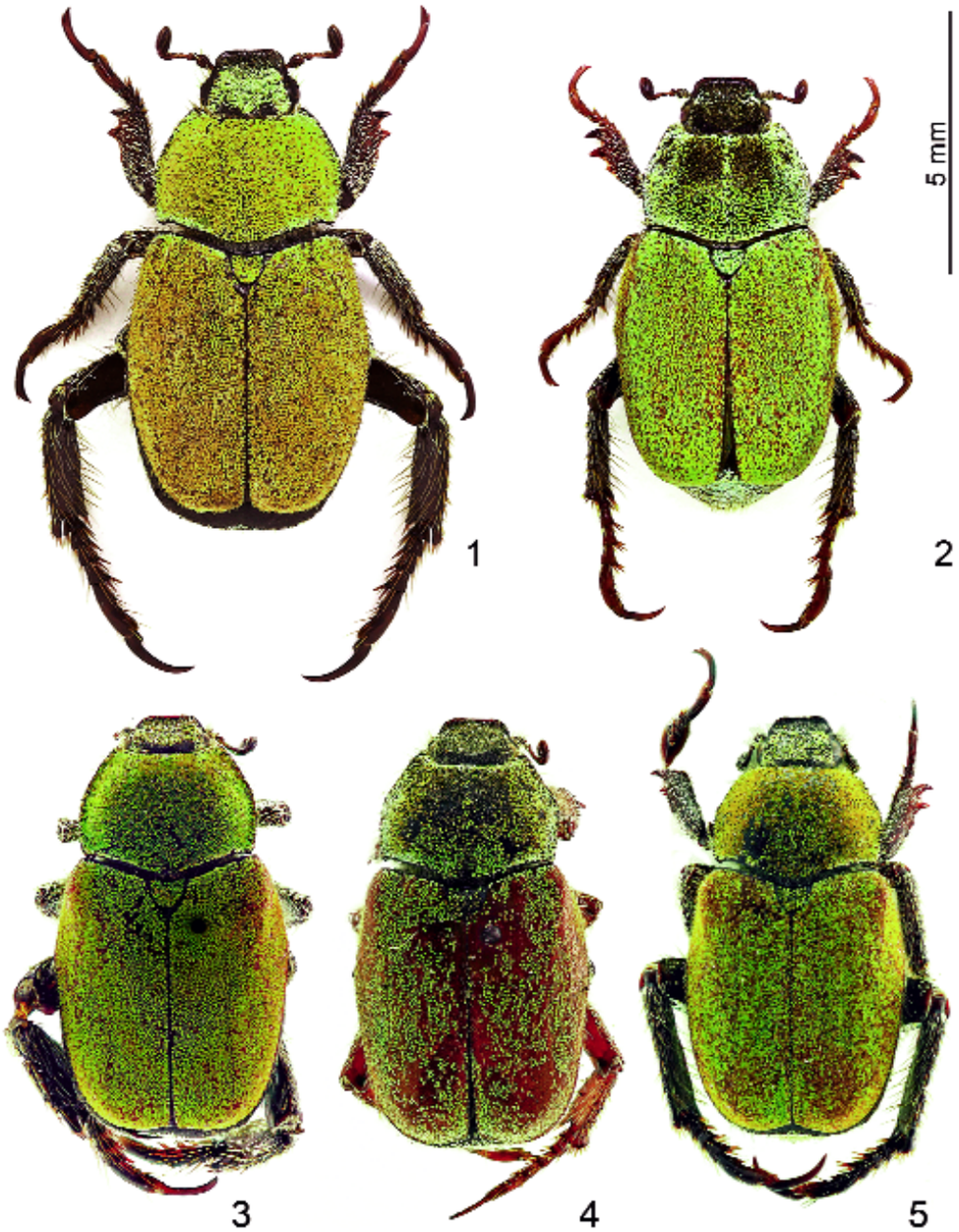
Hoplia caucasica ssp. *danieli,* Holotypus ♂: [Greece] Trypi / Lacedaimoni / Peloponesos / 5.V.1905 / leg. Hartl, ZSM; Allotypus ♀*:* same data of Typus, ZSM (figs. 3-4).

Additional material

Hoplia (*Hoplia*) *laconiae* (44 ♂, 15 ♀): Grecia, Peloponneso, Korinthos, Stila [=Stylia] m 700, 30.5.1998, Leg. F. Angelini: 2 ♂ (AR); Grecia, Peloponn., Korinthos, dint. Stila [=Stylia], 6.6.2001, Leg. L. Saltini: 1 ♂ (AR); Grecia, Achaia, M. Chelmos, rifugio [=Kalavrita Ski center], 20.6.1998, leg. F. Angelini: 4 ♂ (AR), 3 ♂ (MU); Ahaìa, Oros Khelmos, Xerokampos, m 1,500-1,600, 23-25.6.1998, leg. A. Liberto: 2 ♂ (AL); Ahaìa, Oros Khelmos SW, Likourià dint., 1,000 m, 37°52.49N 022°15.02E, 4.V.2001, leg. A. Liberto: 2 ♂ (AL); Grecia, Ilia, Mt. Erimantos, m 900, 4.5.2004, leg. F. Angelini: 1 ♀ (AR); Arkadìa, Oros Mènalon, Nimfasia dint., 940 m, 37°41.71N 22°11.90E, 25.V.2004, 8 ♂, 6 ♀ leg. A. Liberto: (AL); Grecia, Peloponneso, env. Levidi, 25.5.2003, leg. M. Sárovec: 1 ♂ (MU); Grecia, Peloponneso, Serra Menalos, 2km E Vytina, m 1,150, 9.6.2009, leg Szewczyzk: 1 ♂, 1 ♀ (MU); Grecia, Arcadia, Kardara, m 800, 13.5.2004, leg. F. Angelini: 4 ♂, 1 ♀ (AR); Ilìa, Oros Minthi, between Kato Figalià and Krionèri, 720 m, 37° 27.20N 21° 47.87E, 25.IV.2001, leg. A. Liberto: 2 ♂, 1 ♀ (AL); Arkadìa, Oros Pàrnon NE, Plàtanos dint., ca. 500 m, 5.V.1993, leg. A. Liberto: 5 ♂, 3 ♀ (AL); Messinìa, road E 961 between Tripoli e Sparti, km 32, 750 m, 37°14.47N 22° 26.40E, 29.IV.2001, leg. A. Liberto: 8 ♂, 1 ♀ (AL); Grecia, Taygetos, Gozani [=Goranoi], Gole del Monastero, m 1,200, 10.5.2004, leg. F. Angelini: 1 ♀, (AR).

Hoplia (*Hoplia*) *herminiana*: Bosnien, Ivan pl[anina], Apfelbeck, 1 ♂, 1 ♀, (NHMBA, coll. Frey).

Hoplia (*Hoplia*) *caucasica*: Caucase, Elizabethpol [=Kirovabad, Azerbaijan], leg. Babajanides, coll. Mancini, 2 ♂ (MCSNG, coll. Mancini); Caucasus, 1 ♂, (AR, ex coll. Winkler).



Figs. 1-5. *Hoplia laconiae* Petrovitz. **1:** male from Ahaia, M. Chelmos; **2:** female from Ahaia, M. Chelmos; **3:** holotypus of *Hoplia caucasica danieli*; **4:** allotypus of *Hoplia caucasica danieli*; **5:** typus of *Hoplia laconiae*. Photos 3-5 courtesy of A. Ballerio.

Taxonomic treatment and redescription

***Hoplia* (*Hoplia*) *laconiae* Petrovitz, 1958**

Hoplia (s.str.) *laconiae* Petrovitz, 1958: 161

= *Hoplia caucasica* Kolenati ssp. *danieli* Tesař, 1969: 60 **(syn. nov.)**

Redescription of the male (figs. 1, 3, 5)

Colour: integument of the head, pronotum and inferior side black, integument of the elytra brown. Appendages black, except for the protibiae, which have shades of brown along the external margin, and tarsal articles, claws and antennal funicle, which are brownish or partly brownish in some specimens. Scales of the dorsal side (including the pygidium) from dark yellow to green, the pygidium usually of a colder hue than that of the dorsal side and sometimes with blue scales; saturation of the colour from strong to poor, with specimens mostly covered by grayish scales with pale perlaceous reflections. Ventral side and legs bearing scales of perlaceous colour. Scales of the head, margins of the pronotum, pygidium, ventral side and legs more shining than those on pronotum and elytra, having therefore a "metallic" appearance instead of looking dull. Hair of the body and the appendages pale yellow to brown, depending on their thickness.

Vestiture (hairs and scales): all integuments covered by scales, which are densely and uniformly distributed on the dorsal side, masking almost completely the integument. Scales of the head oval, slightly imbricated; scales of the pronotum and elytra isodiametric or very slightly elongated, often touching each other along edges but not imbricated. Scales of the pygidium and of the underside similar in shape to those of the dorsal side, but less dense. Scales of the legs sparse, elongated to piliform. Dorsal side of the body covered by abundant short bristles. They are erect, thinner and slightly longer on the head, shorter, thicker and directed backwards on pronotum and elytra. Lateral margins of the pronotum with long bristles, lateral margins of the elytra with bristles similar to those of the rest of the elytral surface.

Morphology: length 8.6-9.7 mm from the anterior margin of the clypeus to the apex of the pygidium. Clypeus rectangular, with angles broadly rounded and the anterior margin slightly raised, covered with irregular and poorly impressed punctures, roughly aligned in transversal lines. The rest of the head with sculpture similar to that of the clypeus, mostly invisible under the scales. Occipital region, behind the eyes and vertex, with punctures dense and well defined. Antenna composed of 9 segments. Pronotum narrower than the elytra, about 1.4 times longer than wide, with maximum width at half-length. Pronotal sides moderately diverging forward in the basal half, strongly converging in the distal half, entire or with poor crenulation, evident especially in the posterior half; anterior angles slightly acute to almost right, posterior angles right, distinctly protruding backwards in dorsal view. Surface of the pronotum shining, with irregular impressions corresponding to the scales sockets. Scutellum triangular, broadly rounded at the apex, 1.1-1.2 times wider than long. Elytra 1.1-1.2 times longer than wide, narrowing towards the apex, with maximum width at half-length, with well developed humeral callus, parted from the periscutellar area by a small impression. Sutural angle broadly rounded and obtuse. Protibiae with two large teeth and with a barely visible protrusion indicating a third, basal tooth. Outer claw of the protarsi absent or piliform, inner anterior claw large, bifid, ordinarily developed. Inner tarsal claw of the median legs absent, claw of the metatarsi without longitudinal impression. Insertion of the metatarsi on the tibia eccentric, placed in the lower half of the tibia. Last metatarsomere (excluding claw) almost as long as the 4 preceding tarsomeres measured together.

Description of the female (only differences from males are mentioned) (figs. 2, 4)

Colour: integuments as in the male, but for the legs, which are brown. Brown colour is often extended to the whole leg (fig. 4), but can be limited to the tarsi and distal part of the tibiae only (fig. 2). The scales with metallic appearance are more abundant than in males: on the pronotum they are present in a narrow stripe along the anterior and the posterior margins, and cover a wide stripe along the lateral side, but can extend to most of the surface (observed in specimen from Nimfasia, Arkadia). On the elytra they are present along the humeral and the apical region, and along the sides, but can extend to most of the surface (observed in specimens from Nimfasia, Arkadia). Colour of the hairs as in males.

Vestiture (hairs and scales): scale vestiture of the dorsal side not uniform as in the male and, in general, less dense. On the head scales are sparsely present only on a narrow transversal stripe between the base of the clypeus and the eyes. On the pronotum scales are absent from more or less defined areas on the anterior half, sometimes recognizable as six patches, the two on the medial area roughly square in shape and much larger than those placed near the anterior angles. The latter are small, irregular and poorly parted from each other. On elytra, scales are dense on the dorsal side, sparse under the humerus and along the lateral margins. Scale vestiture of the pygidium and of the ventral side similar to that of the male. The shape of the scales is similar to that of the male on the head and pronotum (although slightly imbricated along the anterior angles), on elytra they are from isodiametric to distinctly oval. Bristles structure similar to that of the males, although those on the head not clearly different from that of the rest of the body. Bristles are much denser on the parts of head, pronotum and elytra with scale vestiture scarce or absent.

Morphology: length 8.2-9.0 mm from the anterior margin of the clypeus to the apex of the pygidium. Pronotum with anterior angles slightly more acute than in males. Elytra slightly narrower, with maximum width before half length. Sutural angle of the elytra less rounded and obtuse than in the male. Protibiae with teeth larger than in the male, the third (proximal) tooth well distinct. Lesser claw of the pro- and mesotarsi absent, as in males. Legs less elongated, with last metatarsomerus (excluding claw) well shorter than the 4 preceding tarsomeres measured together.

Taxonomic remarks

Tesař (1969) published a paper dealing with a revision of Himalayan species of the genus *Hoplia*. In the last page of the paper, he briefly described a new *Hoplia* from Greece, treating this taxon as a subspecies of *H. caucasica* Kolenati. He stated that there were no differences between the typical *H. caucasica* and the Greek new taxon he called *H. caucasica danieli*, except for a detail of the elytral scales. The existence of a Greek *Hoplia* close-

ly related to *H. caucasica* was however mentioned for the first time by Reitter (1903: 121, note), whose records were subsequently mentioned by Mikšic (1953: 164) as a not yet confirmed datum.

We could compare the holotype of *H. caucasica danieli* with the type series of *H. laconiae*. They share the lack of the outer claw of the protibiae ("einklauig" in Petrovitz, 1958), together with other notable morphological characters which are diagnostic at the species level for the genus *Hoplia*, such as protibiae with two large teeth, eccentric insertion of the metatarsi on the tibia, claw of the metatibiae without longitudinal impression, shape and colour of body scales.

Based on this morphological evidence, it was concluded that there is no difference between *H. laconiae* and *caucasica danieli*, consequently these taxa should be placed in synonymy.

H. laconiae is well characterized by the outer claw of the protarsi lacking or extremely reduced and hardly noticeable. Beside this remarkable character, it can be distinguished from similar species also by the following chararacters: from *H. herminiana* Apfelbeck, 1908, recorded from Bosnia and Greece (to which Petrovitz compared *laconiae* in his paper), for the smaller size and the brown colour of the legs in the female, whereas in *herminiana* the legs are black in both sexes; from *H. caucasica* Kolenati, 1846, recorded from Caucasus and Iran (of which Tesař supposed his taxon could be a Greek subspecies), for the bidentate protibiae with only a small protrusion instead of the basal teeth, whereas in *caucasica* the protibiae are distinctly tridentate.

Bionomic remarks

To date, *H. laconiae* has been found only in Peloponnesus (Greece), where it seems to be widespread (fig. 6). Documented altitudinal range is remarkably wide, spanning between the low altitude of the type locality (Gythion, located on the coast and surrounded by reliefs not higher than ca. 180 m) and about 1,700 m (Kalavryta Sky Center, Oros Khelmos); however, records are more frequent in the range of 700-1,200 meters.

All specimens collected by A. Liberto were found on flowers of *Crataegus* sp., except for those from Plàtanos, which were found on flowers of *Fraxinus ornus* (A. Liberto, pers. comm.).

Nomenclatorial remarks

In disagreement with the current literature (e.g.: Smetana, 2006), we point out that the correct year of description for *H. herminiana* (and therefore *H. stenolepis* and *H. auriventris*) is 1908 and not 1912. These species were firstly described in Serbo-Croatian (Apfelbeck, 1908); the same author subsequently translated his original work in German (Apfelbeck, 1912).

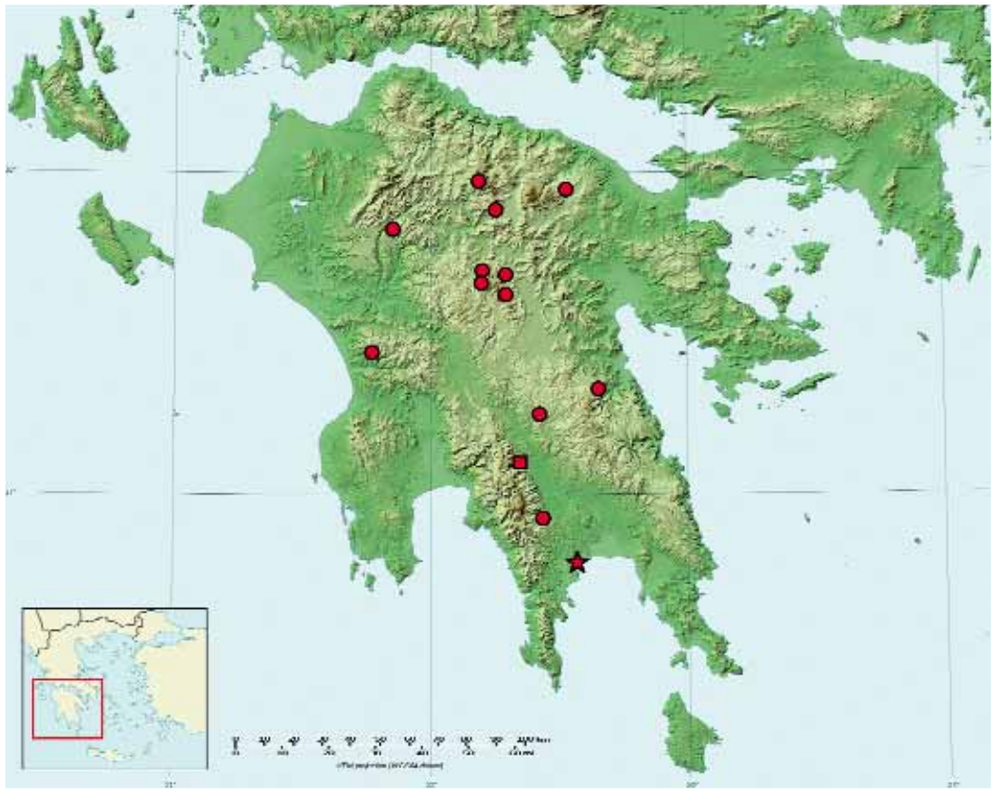


Fig. 6. Distribution of *Hoplia laconiae* according to the examined material. Star: type locality of *H. laconiae*. Square: type locality of *Hoplia caucasica danieli*. Blank map courtesy of Eric Gaba, available at http://commons.wikimedia.org/wiki/File:Peloponnese_relief_map-blank.svg.

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References

Apfelbeck, V., 1908. Paeninsulae balcanicae coleopterorum species novae. *Glasnik Zemaljskog Museja u Bosni i Hercegovini,* 20: 525-532.

Apfelbeck, V., 1912. Fauna Insectorum Balcanica V. 1. Neue Hohlenkäfer aus Bosnien-Herzegowina und Montenegro -2. Neue Koleopteren von der Balkanhalbinsel. *Wissenschaftliche Mitteilungen aus Bosnien und Herzegovina,* 12: 642-664.

Ballerio A., Rey A., Uliana M., Colla A., 2011. Coleoptera Scarabaeoidea nuovi o interessanti per la fauna italiana. *Rivista del Museo Civico di Scienze Naturali "E. Caffi"*, 25: 69-74.

Baraud J., 1992. Faune de France. 78. Coléoptères Scarabaeoidea d'Europe. *Bulletin mensuel de la Société Linnéene de Lyon*, supplement: 1-856.

Carrillo-Ruiz H., Morón M.A., 2011. Phylogenetic relationships of the Genus *Hoplia* Illiger. *Neotropical Entomology*, 40: 217-221.

Carrillo-Ruiz H., Martínez Morales I., Morón M.A., 2008. Comparative study of the reproductive system of two species of *Hoplia* (Coleoptera: Scarabaeidae: Hopliinae). *Proceedings of the Entomological Society of Washington*, 110 (3): 778-788.

Dupuis F., 2005. L´abdomen et les genitalia des femelles de coléoptères Scarabaeoidea (Insecta, Coleoptera). *Zoosystema*, 27 (4): 733-823.

Krell F.T., 1993. Bemerkungen zu Barauds Bestimmungsbuch der Scarabaeoidea (Coleoptera) Europas. *Entomologische Nachrichten und Berichte*, 37: 123-125.

Lacroix M., 1998. Insectes Coléoptères Hopliidae (2eme partie). *Faune de Madagascar*, Paris 88(2): 400-775.

Leo P., Liberto A., Rattu A., Sechi D., 2010. Una nuova specie di *Hoplia* dalla Toscana. *Fragmenta Entomologica*, 42 (2): 453-464.

Löbl I., Smetana A. (eds.), 2007. Errata for Volume 3, pp. 24-31. In: Catalogue of Palearctic Coleoptera vol. 4. *Apollo Books*, Stenstrup: 1-935.

Micó E., Piau O., Galante E., Lumaret J.P., 2003. Taxonomy of Iberian *Hoplia* (Col., Scarabaeoidea, Hopliinae) based on mtDNA analysis. *Molecular Phylogenetics and Evolution*, 26: 348-353.

Mikšic M., 1953. Fauna Insectorum Balcanica: Scarabaeidae. 15 Beitrag zur Kenntnis der Scarabeiden. *Godišnjak Biološkog instituta u Sarajevu*, 6: 49-281.

Petrovitz R., 1958. Zwei neue *Hoplia*-Arten aus dem Mittemeergebiet (Col. Lamell.). *Entomologische Arbeiten aus dem Museum Georg Frey*, 9: 160-162.

Reitter E., 1903. Bestimmungs-Tabelle der Melolonthidae aus der europäischen Fauna und den angrenzendern Ländern. IV Theil (Schluss): Rutelini, Hoplini und Glaphyrini. Heft 51. *Verhandlungen des Naturforschenden Vereines in Brünn*, 41: 27-157.

Smetana A., 2006. Scarabaeidae Melolonthinae Hopliini. In: Löbl, I., Smetana, A. (eds.) Catalogue of Palearctic Coleoptera. Vol. 3. *Apollo Books*, Stenstrup: 184-189.

Tauzin P., 2001. Compléments à la faune des Coléoptères Scarabaeoidea d'Europe de J. Baraud (1992). *L'Entomologiste*, 57 (5): 175-179.

Tesař Z., 1969. Die *Hoplia*-Arten aus Nepal. *Acta Musei Silesiae. Series A: Historia naturalis [Casopis Slezského Musea v Opave (A)],* 18: 53-60.

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