Description of a New *Crypticus* Species (Coleoptera: Tenebrionidae) from Turkey[1]

Sakine Serap Avgın[2] and Julio Ferrer[3]

Osmaniye Korkut Ata University, Art and Science Faculty, Department of Biology, Osmaniye, Turkey

J. Entomol. Sci. 46(1): 68-79 (January 2011)

Abstract A male specimen of *Crypticus* Latreille, 1817 (Coleoptera: Tenebrionidae) was collected in Hatay, Turkey and described as a new species, *Crypticus buyukalacai* **n. sp.** It is separated from *Crypticus quisquilius* (Linné, 1761) and from other presumptive European subspecies and synonymies, previously confused with *C. quisquilius* (L.): *C. pyrenaeus* Baudi, 1876, **stat. nov.** from France and Italy; *C. apreutianus* Gridelli, 1949 **stat. nov.** from central and meridional Italy; *C. opacus* Brancisk, 1899 **stat. nov.** from Turkmenistan, and *C. strauchi* Roubal, 1911, **stat. nov.** from Bosnia. The identity and taxonomic status of *C. quisquilius laticollis* Baudi, 1876, from Iraq, Persia, cannot be established without a revision of the *Crypticus* inhabiting the Mesopotamian region.

Key Words *Crypticus quisquilius* group, taxonomic changes, new species, taxonomic status, Turkey

The Palaearctic representatives of the genus *Crypticus* Latreille, 1817, were revised by Antoine (1945) and Español (1948, 1949, 1950a, b, 1951, 1952, 1954, 1955). The type species of this genus, *Crypticus quisquilius* (Linné, 1761), is a widely-distributed conglomerate of populations treated as the same species after Gebien (1910, 1939) and more recently by Löbl and Smetana (2008), although the latter work was based on Gebien (1910, 1939). A male specimen of *Crypticus* was collected in Hatay, Turkey, allowing us to compare it to other specimens identified as members of the *C. quisquilius* group. We also found the available literature on the taxonomic history of this group to be cryptic and lacking essential details; thus, we undertook a bibliographic search to clarify its taxonomic history, to correctly cite the sources of the abbreviations given by Gebien (1939), and to establish the synonymies of the previous authors including Olivier (1795), Panzer (1796-1798), and Paykull (1798-1800). Our objective was to describe a new species *Crypticus* from Turkey and to separate the Scandinavian, Iberian, European, Central Asiatic and Anatolian relatives, arbitrarily treated as populations of a highly variable species "*Crypticus quisquilius* Linné (1761) et auct.," the only known Scandinavian *Crypticus*.

Materials and Methods

The single male specimen collected from Hatay, Turkey by S.S.Avgın was compared with specimens previously collected from Turkey by S.S. Avgın and 6 additional

[1]Received 20 September 2010; accepted for publication 25 October 2010.

[2]Corresponding author (email: serapavgin@osmaniye.edu.tr; serapavgin@hotmail.com).

[3]Department of Entomology, The Swedish Museum of Natural History, S-10405 Stockholm, Sweden.

specimens representing 5 syntypes of *Crypticus quisquilius* (Paykull, 1798), in a series with a presumptive syntype of *Tenebrio quisquilius* Linné, 1761, from the collection of Gustav von Paykull, preserved in the Museum Naturhistoriska Riksmuseet (NHRS) (Stockholm, Sweden). The older specimens from NHRS were compared with recently-collected specimens from diverse locations in Turkey and Sweden as well as with a series of males and females from Spanish, European, Mongolian, Siberian, and Anatolian (Turkey) localities.

The older specimens used for these comparisons were first cleaned in a solution of distilled water and 80% (v/v) ethanol, followed by submersion in acetone for 60 min, and a final rinse in 90% (v/v) ethanol. The recently-collected specimens were cleaned with detergent and boiled in water. Genitalia were extracted and examined after the specimens softened within 24 h of treatment. Drawings and photos were prepared by the first author. The bibliographic information of the taxonomic history of *C. quisquillius* was provided primarily in the Library of the Royal Academy of Sciences (Cabinet of Rare Books) in Stockholm, Sweden and in the Library of the Entomological Society of Sweden.

Results and Discussion

Bibliographic search. The taxonomic history of *C. quisquillius* was, heretofore, cryptic with abbreviated references to invalid names as evidenced in Gebien (1939) with, "*glaber* Fabricius,/Panzer,/Olivier, III,/Lap./Redt./Stu./Bach/*laevis* Gmelin, 1788,/*laticollis* Panz., 1805/*luctuosus* Schr., 1781/*niger* Fourcroy 1785/*pusillus* Herbst, 1799/var. *laticollis* Baudi, 1876/*opacus* Brancs. Jahresber. Ver. Trensen, 21, 100 1899/Reitter, 14". However, based upon our search of the literature, we accept the present classification of available names and synonymies of *Crypticus quisquilius* (Linné, 1761) as outlined herein.

Gebien (1939) attributed *Crypticus quisquilius* to Paykull (1798-1800); however, Linné (1761) described *Tenebrio quisquilius* in Fauna Sueciae (p. 226). This taxonomic name was ignored by several authors, thus creating the synonymies *Helops glaber* Fabricius, 1775, *Tenebrio luctuosus* Schrank, 1781, *Pimelia laevis* Gmelin, 1790, *Helops laticollis* Panzer, 1798, *Tenebrio niger* Geoffroy in Fourcroy, 1785, and *Blaps pusillus* Herbst, 1799. The specific name *Helops quisquilius* was used by some authors for Helopini: *Nalassus dermestoides* (= *Helops quisquillius* Fabricius, Panzer, 1798). Closely-related species of *Crypticus* subsequently described were *C. quisquilius* var. *pyrenaeus* Baudi, 1876, from France and Italy; *C. quisquilius* var. *laticollis* Baudi, 1876, from Persia; *C. quisquilius* var. *opacus* Brancisk, 1899, from Turkmenistan; *C. quisquilius strauchi* Roubal, 1911, from Bosnia, and *C. quisquilius apreutianus* Gridelli, 1949. Recently, Scupola (1998) cited *C. quisquilius* Paykull from Greece. Gebien (1910) treated the variety *pyrenaeus* Baudi, 1876, as a valid species, but later revised it to the rank of variety with *C. quisquilius* var. *pyrenaeus* Baudi, 1876, and noted its occurrence from the French Pyrinées to Italy (Gebien 1939). It was redescribed by Español (1950b) from the northern region of the Iberian Peninsula.

Gebien (1939), for uncited reasons, rejected the authority of Linné (1761) for *Crypticus quisquilius*, previously used in Gebien (1910), and proposed *C. quisquilius* (Paykull, 1798-1800) as *nomen conservandum*, for the species *Tenebrio quisquilius* described by Linné (1761). Español (1950b) considered *C. quisquilius* Linnaeus (without year), as a group of species, including European, central Asiatic, Anatolian and Persian forms and cited the Iberian representatives as a geographical race, belonging

to the subspecies *C. quisquilius pyrenaeus* Baudi, 1876, that is widely distributed in the mountain systems of the northern Spain from the Pyrenées to the Castilla region in central Spain.

Taxonomic comparisons and revisions.

***Crypticus quisquilius* (L.) (Figs. 1A, 2F, 7A)**

Tenebrio quisquilius Linné, 1761: 226

Helops quisquilius Fabricius, 1775: 258

Helops quisquilius Paykull, 1798: 96 et auct.

Helops glabra Paykull 1798: 97

Crypticus quisquilius (Linné 1761) is the available name for a species of darkling beetle from Sweden, described in Fauna Sueciae, and it is a synonym of *Helops glaber* Fabricius (1775, p. 258) and of *Helops quisquilius* (L.) described by Fabricius L. 1775, on the same page. Consequently, Paykull (1798), in arranging the material preserved in his own collection and described in Fauna Sueciae, placed *Helops quisquilius* under his own label with the text "glabra", thus, establishing the synonym. Paykull (1798-1800) cited with this name several specimens from Germany. However, in the collection of William Hunter, housed in the Hunterian Museum of Glasgow, JF found specimens determined by Fabricius and carrying the label *Helops quisquilius* Fab. Att. Bottom. The specimens belong to a Helopini genus *Nalassus* (probably *N. dermestoides*) and correspond to the figure in Panzer (1796-1798).

Repository of Type: The Linnean Society of London (Dr. Sharon Shute, personal comm.). Not examined. The Linnean specimens of *Tenebrio quisquilius* cannot be communicated and must be examined *in situ*.

Locus typicus: Suecia.

Material examined: SWEDEN: Six specimens pinned without labels, placed under a label, attached to bottom "*quisquilius* L." An older specimen, perforated by a shorter pin exhibiting the characteristic concentric spiral head of the pins used by Linnés (Ferrer and Holston, 2009), also was found in the collection. This specimen was assumed to be loaned or borrowed by Paykull from Linné himself and transferred to his own collection that is maintained in the Collection Paykull, Swedish Museum of Natural History, Stockholm. We considered this specimen as a presumptive Linnean syntype or a historical specimen with type personally compared by Paykull. According to a personal communication from Dr. Sharon Shute, the type of *Tenebrio quisquilius* is preserved in the Linnean Society of London, repository for the Collection Linnaeus.

Additional material: SWEDEN: Aol. Boh. = Öland, Boheman (NHRS); Skåne: Århus, 4.VII.1954, Hedquist leg. Orttenby, Öland, 24.VII.1976 (NHRS), Ekerum, 26. VI.1979; POLAND: Poznan, 17.V.2009, R. Röber leg. (CJF); TCHEKIEN: Moravia, Cejk, 13.VI.1990, P. Cechevsly leg. (CJF); GERMANY: Nordrhein Westfalien, Borussia, Mewes leg. (NHRS).

***Crypticus pyrenaeus* Baudi, 1876 stat. nov. (Figs. 1B, 2D, 5, 7B)**

***Crypticus quisquilius* var. *pyrenaeus* Baudi, 1876: 33**

Type: not located. Probably preserved in Museo Civico de Genova Andrea Doria (coll. Baudi), Italy.

Locus typicus: Pirinei.

Material examined: FRANCE: Pyrinées; Ribercourt, 24.VI.1978, Jeanne leg. (CJF); SPAIN: La Molina, 7.VII.1969, T. Palm leg. (CJF); Picos de Urbión, 6.I.1921, escalera leg. (MNCN); Cameros, Montenegro, 2.VI.1924, C. Bolívar leg. (MNCN); Picos de Moncayo, 5 - 7.000 fts. h. (MNCN).

Easily distinguished using Español (1950b) key and diagnostic characters. Tegument shiny and strongly punctured, widely distributed in the Pyrynean region and in the mountains of the Northern region of the Iberian Peninsula.

***Crypticus apreutianus* Gridelli, 1949 stat. nov. (Figs. 2C, 6)**

***Crypticus quisquilius apreutianus* Gridelli, 1949: 272**

Type: Repository of type: Museo Civico Storia Naturale, Genova, Italy. Not examined.

Locus typicus: G. Sasso, Majella, M. Terminillo, M. Marsicano, M. Velino, M. Miletto (Matera). Abruzzi.

Material examined: ITALY: Iconography: Aliquo et al. (2007).

ITALY: Monte Pollino, Calabria, T. Palm and L. Brundin leg. (NHRS).

The conspicuous differences (Fig. 1) of shape of the aedeagus of the European populations assigned to *C. quisquilius* can be subjectively interpreted as progressive variations of widely-distributed populations in a vast geographic region. For this reason, the ovipositor of the Italian specimens from the Pollino Mountains was examined and compared with the ovipositor of *C. quisquilius* from Sweden, with *C. pyrenaeus*

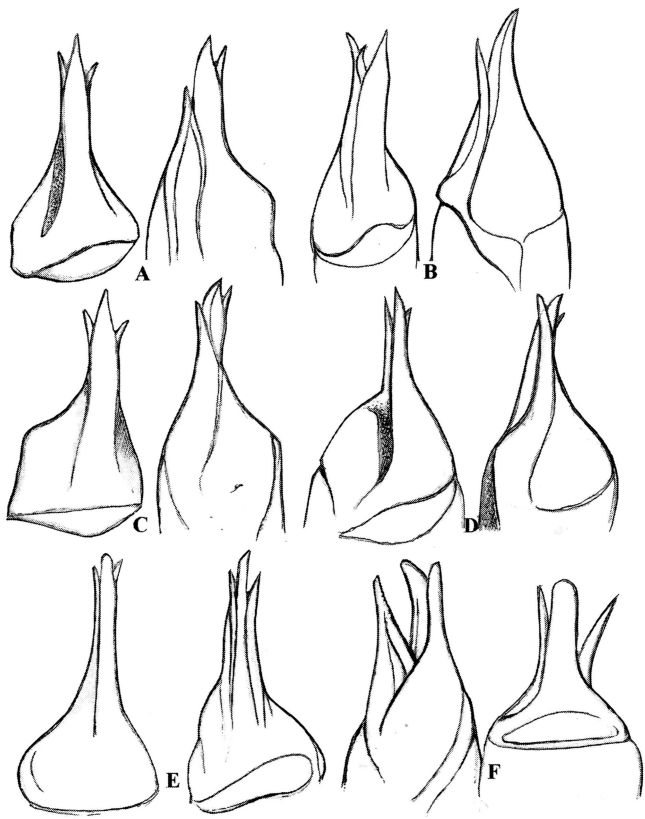

Fig. 1. Aedeagus of *Crypticus*: A. *Crypticus quisquilius*; B. *C. pyrenaeus*; C. *C. opacus*; D. *Crypticus* sp. cf. *quisquilius*; E. *C. strauchi*; F. *Crypticus buyukalacai* n. sp. (holotype).

from France, and with specimens similar to *C. quisquilius* from other countries and regions representing different taxa described by preceding authors listed below. The conspicuous differences observed clearly indicated the validity of respective forms, treated heretofore as separate species. However, the present classification is preliminary, and more research is needed to define the geographical limits of the previously-described taxa and to separate other possible undescribed species that have been confused with the conglomerate *C. quisquilius* et auct.

***Crypticus opacus* Brancisk, 1899 stat. nov. (Figs. 1C, 2E, 8)**

***Crypticus quisquilius* var. *opacus* Brancisk, 1899: 100**

Type: not found, repository of type unknown.

Locus typicus: Ashabad.

Material examined: GEORGIA: Tibilise, Tibiliskoje Osero, 23.VI.1985, D. Wrase leg. (CJF); Georgia, Osset. Kasbegi,1.VII,1988, D. Wrase leg. (CJF); Southern Sibiria, Fritz Jensen (NHRS); MONGOLIA: 6 km SW Somon Barunturuum, 1350 m; 24. VI.1968, Z. Kaszab exp. (CJF); Ulan Bator, Davany Sörlug, IX.1998, U. Zophel leg. (CJF); SW Altai, Katanda, 800 m, River Katun, H. Hippa leg. (CJF).

We attributed to this species, described from Ashabad, Turkestan, the specimens from Georgia, close to specimens from populations from South Siberia and from Mongolia, as having tegument strongly and densely punctured, exhibiting elongated pronotal punctures with elytra sometimes finely striate. Research is needed to separate and define the specific or intraspecific variation of the populations subjectively treated as *C. quisquilius* auct.

***Crypticus strauchi* Roubal, 1911 stat. nov. (Figs. 1E, 2A)**

***Cryticus quisquilius* var. *strauchi* Roubal, 1911: 133**

Type: not found, repository of type unknown.

Locus typicus: Bihac, Bosnia.

Material examined: YUGOSLAVIA: Museum of the University of Lund, Sweden (ZMUL). AUSTRIA: Wien, 6.VI.1955, O. Lundblad leg. (NHRS). HUNGARY: Dömsöd, 15.V.1953, I. Kovacs leg. (CJF); Törökvesz, 13.5.1945, Csiki leg. (CJF); Legynaza Bacs, 23.VI.2004 (leg. and coll. R. Röber). ROMANIA: Mamaia, Constanza, 17.VI.2004, (leg. and coll. R. Röber). BULGARIA: Balchik, Balczich/Candèze (SMNH); Nassebar, VI.1975, J. Ferrer leg; id. Slunchev Bryag (CJF); Albena, 10.VI.1990 J. Ferrer leg. (CJF). TURKEY: Sögut, old Lake, Antalya, 10.VI.1991, Janne leg. (CJF); Hatay province: Hassa-Demrek, 12.IV.2008, S.S. Avgın leg.; Hatay province: Erzin-Gökdere, 17.VI.2008, S.S. Avgın leg.; Nevşehir Province: Ürgüp, Aksalur, 22.V.2008, S.S. Avgın leg. specimens preserved in the collection Sakine Serap Avgın (Biology Department of Osmaniye Korkut Ata University).

Described from Bihac, Bosnia, Eugen Strauch leg. in the coll. E. Roubal. The type was not located, but probably exists in the coll. Hans Gebien (Coll. Frey) in Basel, Naturhistorische Museum. We included in this species specimens from the Panonian depression (Furon 1950), inhabiting the natural region between Austria, Bosnia-Hercegovina, Hungary, Romania, Bulgary, and Nord-Western Turkey. Its distribution in the Anatolian region is poorly known. We have seen a series of 6 males and 2 females from Antalya and 3 specimens from Hatay (2 male) and Nevşehir (1 male). The specimens examined exhibited some superficial differences; mitochondrial DNA studies should be undertaken to establish the specific or infra-specific status.

We considered the whole as the form described as a variety under the name *strauchi* Roubal, 1911, which differs from *C. quisquilius* and other taxa by the structure of the elytral tegument, which is dull, coriaceous, and conspicuously but finely punctured, flattened distally and with striae completely absent. The single specimen

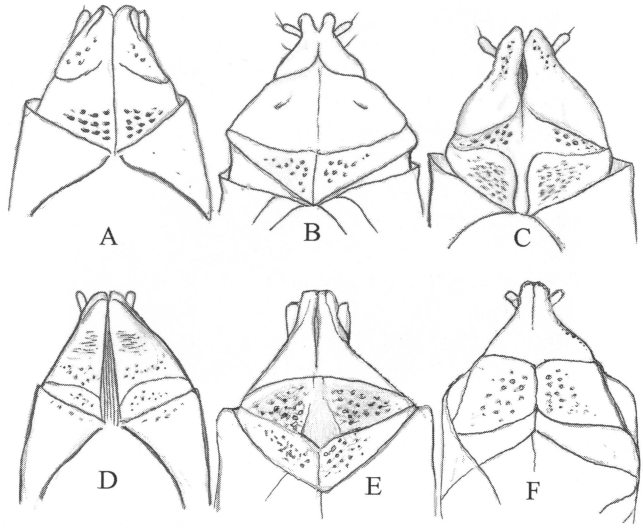

Fig. 2. Ovipositors of *Crypticus*: A. *Crypticus strauchi*; B. *Crypticus* sp. Siberia; C. *Crypticus apreutianus* stat. nov. (Mte Pollino); D. *Crypticus pyraeneus*; E. *Crypticus opacus*; F. *Crypticus quisquilius*.

from Northern Turkey, collected in Bursa (Uludag) (Tezcan et al. 2004) likely belongs to *C. strauchi*; further study is needed.

***Crypticus buyukalacai* n. sp. (Figs. 1F, 4, 9)**

Material examined: Holotype: Male. Turkey: Hatay province: Hassa-Demrek, 28.V.2008; 36°40' 47" N, 36°25'17" E, 458 m; S.S. Avgın leg. (Biology Department of Osmaniye Korkut Ata University).

Diagnostic description: Dimensions: Long.: 5.9 mm; maximum of width at elytra: 2.3 mm. *Crypticus* new species of the *C. quisquilius* group. Similar in shape to *C. pyrenaeus*

Fig. 3. Dorsal sculpture of *Crypticus* sp. cf. *quisquilius*.

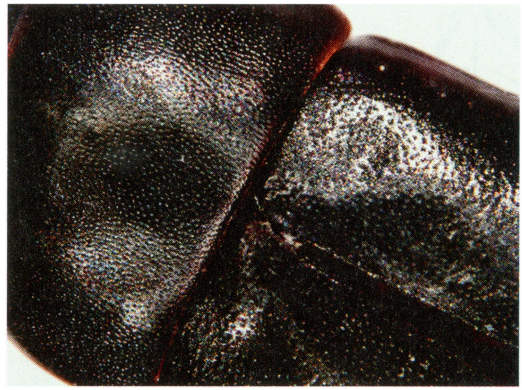

Fig. 4. Dorsal sculpture of *Crypticus buyukalacai* n. sp. (holotype).

Baudi, the most divergent representative of this group, in the Mediterranean region. This new species differs from *C. strauchi*, collected from Hatay province and Nevşehir province and from the Antalya province. This new species is easily distinguished by several conspicuous characters, namely, strongly punctate, lustrouse, shiny tegument and enlarged ocular ratio, measured laterally. The specific validity is strongly supported by different conformation of prosternal apophyse, unmargined and rounded, not pointed (Fig. 1F), the depressed anal sternite, and by the parameral piece of the aedeagus (Figs. 1F, 4).

The sympatric geographical distribution area of *Crypticus strauchi* and the new species *C. buyukalacai* in Hatay, Southern Turkey exhibit specific separation and justified our treatment of both insects as separate species. All *Crypticus* (sensu Español 1948, 1949, 1950a, b, 1951, 1952, 1954, 1955), and especially the species of the *C. quisquilius* group (sensu Español 1950b) are extremely homogenous and only distinguishable by comparison of the genitalia and dorsal sculpture. A key to separate European species is given below.

Fig. 5. Dorsal sculpture of *Crypticus pyrenaeus*.

Fig. 6. Dorsal sculpture of *Crypticus apreutianus*.

Etymology: The species is dedicated to named in honor of Prof. Dr. Orhan Büyükalaca, Rector of the University of Osmaniye Korkut Ata, Osmaniye province, Turkey, who has supported entomological studies of the first author.

Fig. 7. Habitus of *Crypticus*: A. *C. quisquilius*; B. *Crypticus pyrenaeus*.

Fig. 8. Habitus of *C. opacus*.

Habitat: Rural, steppes, grass lands and meadows are dominant.

Taxonomic key of characters of males of *Crypticus quisquilius* group (Females can be identified with ovipositors (Figs. 2A, 2B, 2C, 2D, 2E, 2F) and external morphology):

1 Parameral asymmetric piece at left in dorsal view short, as long as the base of the parameral piece (Figs. 1A, 1C, 1D)..... 2

Parameral asymmetric piece at left elongated, proportionally long and smaller (Fig. 1E) or proportionally short and broad (Figs. 1B, 1F).....5

2 Dorsal surface of tegument dull, often coriaceous, strongly or moderately punctured on elytra; Basal piece of parameral regularly rounded or strongly and clearly obtuse at left, when examined dorsally (Figs. 1A, 1C).....3

Dorsal surface of tegument shiny and strongly punctured; Basal piece of parameres rounded (Fig. 1B).....4

3 Aedeagus with dorsal sulcus of the left paramere conspicuously incised (Figs. 1A, 1D).....4

Aedeagus with dorsal sulcus of the left paramere weakly marqued (Figs. 1B, 1C, 1E, 1F).....5

4 Dorsal surface (Fig. 3, 2F), lateral contour of the parameral piece moderately obtuse.....*quisquilius* L.

Dorsal surface (Fig. 6), lateral sulcus of the parameral piece, and contour of the lateral piece of the parameres as in the preceding species (Fig. 1A), but ovipositor (Fig. 2C) showing conspicuous differences.....*apreutianus* Gridelli. **stat. nov.**

Fig. 9. Habitus of C. *buyukalacai* n. sp. (holotype).

5 Aedeagus very broad apically, as indicated in Figs. 1B, 1F.....7
Aedeagus smaller apically as indicated in Figs. 1C, 1E.....6
6 Dorsolateral sulcus of the parameres of aedeagus reduced to a superficial impression (Fig. 1E). Paramere elongate; Body finely and densely punctured, elytra without traces of striae; occurring from Panonian region in East Europa, western Anatolian, (border of the geographical confines unknown).....*strauchi* Roubal.
Body strongly and densely punctured, exhibiting elongate pronotal punctures and elytra finely, but sometimes conspicuously striate. Dorsal surface as in Fig. 2E. Lateral sulcus of the parameral piece superficial, contour of the lateral piece of the parameres very strongly obtuse (Fig. 1C).....*opacus* Brancisk **stat. nov.**
7 Aedeagus with paramere triangularly pointed, conformed as indicated in Fig. 1B... .....*pyrenaeus* Baudi. **stat. nov.**
Dorsolateral sulcus of the paramere conspicuous, but superficial. Aedeagus proportionally short, paramere rounded and massive, conformed as indicated in Fig. 1F; occurs from Turkey.....*buyukalacai* **n. sp.**
(Central Asiatic to Siberian populations attributed to *C. quisquilius* need revision.)

Acknowledgments

The authors thank Prof. Orhan Büyükalaca, Rector of Osmaniye Korkut Ata University, Osmaniye province, Turkey, who has supported entomological studies of the first author. We also thank Dr. Sharon Shute, Natural History Museum and Linnean Society of London, Dr. Olivier Montreuil and M. Antoine Mantilleri, Muséum National d´Histoire Naturelle, Paris, Dr. Harold Labrique, Centre du Conservation and Etude des Collections (CCEC, Lyon), Dr. G. Hancock, Museum of Zoology of the University of Glasgow, Scotland; Prof. Fredrik Ronquist and Mr. Bert Viklund, Naturhistoriska riksmuseet, Stockholm, for assistance in searching historical collections.

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