

University of Nebraska - Lincoln

DigitalCommons@University of Nebraska - Lincoln

Insecta Mundi

Center for Systematic Entomology, Gainesville,
Florida

3-23-2012

**Taxonomic notes on *Onthophagus (Palaeonthophagus)*
lemuroides d'Orbigny, 1898 and *O. (P.) fortigibber* Reitter, 1909
(Coleoptera: Scarabaeidae: Scarabaeinae: Onthophagini)**

Stefano Ziani
Meldola, Italy, stefanoziani@alice.it

Follow this and additional works at: <https://digitalcommons.unl.edu/insectamundi>



Part of the [Entomology Commons](#)

Ziani, Stefano, "Taxonomic notes on *Onthophagus (Palaeonthophagus) lemuroides* d'Orbigny, 1898 and *O. (P.) fortigibber* Reitter, 1909 (Coleoptera: Scarabaeidae: Scarabaeinae: Onthophagini)" (2012). *Insecta Mundi*. 728.

<https://digitalcommons.unl.edu/insectamundi/728>

This Article is brought to you for free and open access by the Center for Systematic Entomology, Gainesville, Florida at DigitalCommons@University of Nebraska - Lincoln. It has been accepted for inclusion in Insecta Mundi by an authorized administrator of DigitalCommons@University of Nebraska - Lincoln.

INSECTA MUNDI

A Journal of World Insect Systematics

0217

Taxonomic notes on *Onthophagus* (*Palaeonthophagus*) *lemuroides*
d'Orbigny, 1898 and *O. (P.) fortigibber* Reitter, 1909 (Coleoptera:
Scarabaeidae: Scarabaeinae: Onthophagini)

Stefano Ziani
via S. Giovanni, 41/a,
47014 Meldola (FC)–Italy.
stefanoziani@alice.it

Date of Issue: March 23, 2012

Stefano Ziani

Taxonomic notes on *Onthophagus (Palaeonthophagus) lemuroides* d'Orbigny, 1898 and *O. (P.) fortigibber* Reitter, 1909 (Coleoptera: Scarabaeidae: Scarabaeinae: Onthophagini)

Insecta Mundi 0217: 1-9

Published in 2012 by

Center for Systematic Entomology, Inc.

P. O. Box 141874

Gainesville, FL 32614-1874 U. S. A.

<http://www.centerforsystematicentomology.org/>

Insecta Mundi is a journal primarily devoted to insect systematics, but articles can be published on any non-marine arthropod. Topics considered for publication include systematics, taxonomy, nomenclature, checklists, faunal works, and natural history. **Insecta Mundi** will not consider works in the applied sciences (i.e. medical entomology, pest control research, etc.), and no longer publishes book reviews or editorials. **Insecta Mundi** publishes original research or discoveries in an inexpensive and timely manner, distributing them free via open access on the internet on the date of publication.

Insecta Mundi is referenced or abstracted by several sources including the Zoological Record, CAB Abstracts, etc. **Insecta Mundi** is published irregularly throughout the year, with completed manuscripts assigned an individual number. Manuscripts must be peer reviewed prior to submission, after which they are reviewed by the editorial board to ensure quality. One author of each submitted manuscript must be a current member of the Center for Systematic Entomology.

Managing editor: Paul E. Skelley, e-mail: insectamundi@gmail.com

Production editors: Michael C. Thomas, Ian Stocks, Brian Armitage

Editorial board: J. H. Frank, M. J. Paulsen

Subject editors: G.B. Edwards, J. Eger, A. Rasmussen, F. Shockley, G. Steck, Ian Stocks, A. Van Pelt, J. Zaspel

Spanish editors: Julieta Brambila, Angélico Asenjo

Printed copies (ISSN 0749-6737) deposited in libraries of:

CSIRO, Canberra, ACT, Australia

Museu de Zoologia, São Paulo, Brazil

Agriculture and Agrifood Canada, Ottawa, ON, Canada

The Natural History Museum, London, Great Britain

Muzeum i Instytut Zoologiczny PAN, Warsaw, Poland

National Taiwan University, Taipei, Taiwan

California Academy of Sciences, San Francisco, CA, USA

Florida Department of Agriculture and Consumer Services, Gainesville, FL, USA

Field Museum of Natural History, Chicago, IL, USA

National Museum of Natural History, Smithsonian Institution, Washington, DC, USA

Zoological Institute of Russian Academy of Sciences, Saint-Petersburg, Russia

Electronic copies (On-Line ISSN 1942-1354, CDROM ISSN 1942-1362) in PDF format:

Printed CD mailed to all members at end of year.

Florida Center for Library Automation: <http://purl.fcla.edu/fcla/insectamundi>

University of Nebraska-Lincoln, Digital Commons: <http://digitalcommons.unl.edu/insectamundi/>

Goethe-Universität, Frankfurt am Main: <http://edocs.ub.uni-frankfurt.de/volltexte/2010/14363/>

Author instructions available on the Insecta Mundi page at:

<http://www.centerforsystematicentomology.org/insectamundi/>

Copyright held by the author(s). This is an open access article distributed under the terms of the Creative Commons, Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original author(s) and source are credited. <http://creativecommons.org/licenses/by-nc/3.0/>

Taxonomic notes on *Onthophagus (Palaeonthophagus) lemuroides* d'Orbigny, 1898 and *O. (P.) fortigibber* Reitter, 1909 (Coleoptera: Scarabaeidae: Scarabaeinae: Onthophagini)

Stefano Ziani

via S. Giovanni, 41/a,
47014 Meldola (FC)–Italy.
stefanoziani@alice.it

Abstract. The taxonomic position of *Onthophagus (Palaeonthophagus) lemuroides* d'Orbigny, 1898 and *Onthophagus (Palaeonthophagus) fortigibber* Reitter, 1909 is discussed (Coleoptera: Scarabaeidae: Scarabaeinae: Onthophagini). A key to the species is given. Photos of type specimens of the two taxa and significant chromatic varieties, and drawings of aedeagi are presented.

Key words. Coleoptera, Scarabaeidae, *Onthophagus*, taxonomy, Middle East, Caucasus.

Introduction

Onthophagus lemuroides d'Orbigny, 1898 and *Onthophagus fortigibber* Reitter, 1909 (= *Onthophagus tricuspsis* Semenov, 1900, primary junior homonym of *Onthophagus coenobita* var. *tricuspsis* Mulsant, 1842) are two species belonging to the subgenus *Palaeonthophagus* Zunino, 1979 (Coleoptera: Scarabaeidae). While *O. lemuroides* is found in the Middle East and *O. fortigibber* in Caucasus and south-eastern Europe, Turkey is the only country where both species are sympatric.

As with other species of *Onthophagus* Latreille, 1802, both *O. lemuroides* and *O. fortigibber* have strong intraspecific variability in placement and size of the elytral spots. It is relatively easy to distinguish typical specimens of the two species based on elytral color patterns alone, but it is not so simple with other chromatic variations. The two species have similar pronotal development in both sexes and the lamellae copulatrices of the male genitalia are almost indistinguishable.

After studying the type series and some noteworthy chromatic varieties, a systematic understanding of the two taxa is proposed, together with a key to morphologically similar species. New external and genitalic characters are provided for distinguishing the two species.

Historical review. *Onthophagus lemuroides* was described by d'Orbigny (1898a) from Iraq and Iran based on an undefined number of specimens—three, according to Zunino (1975). Two years later Semenov (1900) described *O. tricuspsis* based on a single male from Caucasus. In the original diagnoses both species were compared to *Onthophagus lemur* (Fabricius, 1781).

In the same year d'Orbigny (1900) published a note in which he considered *O. tricuspsis* to be a junior synonym of *O. lemuroides*, based of the original description only. This synonymy was never accepted by the subsequent authors, starting with Olsoufieff (1900) who stated that *O. tricuspsis* was closer to *Onthophagus trigibber* Reitter, 1892, a species found in north-western Africa.

Nine years later Reitter (1909) described *Onthophagus fortigibber* based on a single specimen from Caucasus. It was described as a male in the original description but is actually a female according to Zunino (1978). Reitter (1909) compared *O. fortigibber* with *O. trigibber*.

Olsoufieff (1918) was the first to consider *O. fortigibber* a junior synonym of *O. tricuspsis*. This last name was considered valid by all the subsequent authors, apparently unaware that *Onthophagus tricuspsis* Semenov, 1900 is a primary junior homonym of *Onthophagus coenobita* var. *tricuspsis* Mulsant, 1842. Tarasov (2005), Löbl et al. (2006) and Kabakov (2006) re-established the valid name *Onthophagus fortigibber* Reitter, 1909, which was the first available synonym of *O. tricuspsis*.

Finally, Bogachev (1930) described *Onthophagus unxovi* from Caucasus which was synonymized with *O. fortigibber* by Tarasov (2005).

Materials

Abbreviations of collections:

HNHM	–	Termesztudományi Múzeum Allattára, Budapest (Hungary)
LNCB	–	László Náday private collection, Budapest (Hungary)
MNHN	–	Muséum National d'Histoire Naturelle, Paris (France)
SZCM	–	Stefano Ziani private collection, Meldola–Forlì (Italy)

Onthophagus (Palaeonthophagus) lemuroides d'Orbigny, 1898

(Fig. 1–8)

Onthophagus lemuroides d'Orbigny 1898a: 177; 1898b: 188; 1900: 296; Olsoufieff 1900: 274; 1918: 47; Boucomont and Gillet 1927: 124; Winkler 1929: 1033; Balthasar 1963: 417; Petrovitz 1968: 465; Zunino 1975: 163; Carpaneto 1977: 34; Carpaneto et al. 2000: 231; Tauzin 2001: 42
Onthophagus (Palaeonthophagus) lemuroides: Zunino 1979: 9; Löbl et al. 2006: 168; Kabakov 2006: 190

Type locality. “Mésopotamie, Perse” [Iraq, Iran].

Type material. Lectotype, a male, designated by Zunino (1975), and 2 paralectotypes in MNHN (examined).

Diagnostic features. Length 4.5 to 7.5 mm. Color blackish brown, moderately shiny, with distinct isodiametric microreticulation, head and pronotum of some with cupreous or greenish lustre; elytra ochreous, usually with dark brown symmetrical v-shaped spots, some with spots joined to each other or lacking in some interstriae, some with first interstriae brown along entire length; some with entire elytral surface blackish brown, without ochreous areas, or, vice versa, the whole elytral disc yellow, spots, if present, limited to the sides (Fig. 1–5); pubescence pale yellow.

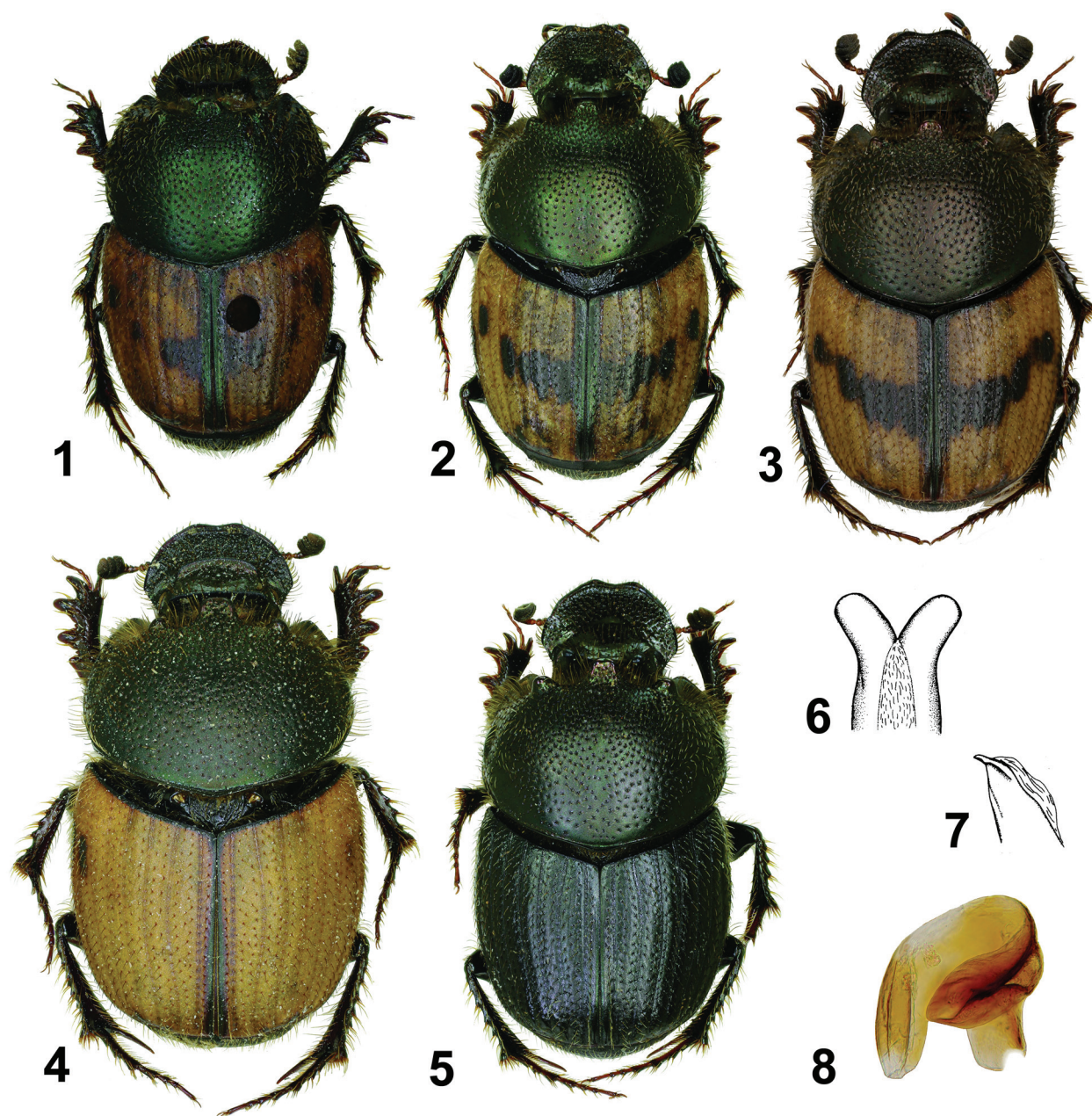
Head with clypeus broadly round on either side of clear median emargination, can be sinuate near obviously produced genae. Clypeofrontal carina weak or absent in males, moderately elevate but distinct, bent backward in females; occipital carina extended in a lamina ending in a pair of erect horns in major males, reduced to a narrow straight lamina in females and minor males. Clypeal and frontal surface with large setigerous punctures, in males more widely spaced on frons than on clypeus; females only with frontal surface simply punctate, clypeal surface with very coarse, transversely rugose or sub-rugose punctures. Setae long and erected.

Pronotum convex, declivous anteriorly, with distinct anterolateral tubercle on either side and with an anteromedian round prominence, clearly projecting further forward than the anterolateral tubercles. Anterior angles distinctly produced, sides not or very indistinctly sinuate behind them. Dorsal surface setigerously punctate, punctures broad, sub-regular in distribution, separated by 1–3 diameters on disc, becoming sparser toward base; each puncture bears a small granule at its anterior margin, and a long pale yellow seta.

Elytral striae shiny, barely impressed, with punctures slightly larger than stria width and barely crenating interstitial sides. Interstriae flat to barely convex, sometimes the 4th interstria more convex than the others, all, except the sutural interstria, rather regularly biserially granulate; granules slightly smaller than stria punctures; posterior margin of each granule with a small, indistinct, setigerous puncture; setae pale yellow, thin, shorter than pronotal ones.

Pygidium with widely spaced, setigerous punctures; setae yellow, long, thin.
 Inner angle of protibial apex with a small denticle strongly curved downward in males, females lacking denticle.

Parameres (Fig. 6–7) short, slightly sinuate along sides, latero-apical spatulae not bent ventrally, obviously diverging apically, without latero-proximal denticle, latero-apical angle round. Lamella copulatrix (Fig. 8) typical of the subgenus *Palaeonthophagus*, horseshoe shaped and clearly emarginate at one side, right lobe with a strongly sclerotized plica ventrally bent.



Figures 1-8. *Onthophagus (Palaeonthophagus) lemuroides* d'Orbigny, 1898. **1)** Lectotype male. **2)** Male (IR-Lorestān, Nehāvand Kosio Āb, 1860 m). **3)** Male (TR-Malatya, 10 km S Tepehan, 1200 m). **4)** Female (TR-Gümüşhane, Bayburt, 2000 m). **5)** Male (TR- Malatya, Reşadiye geçidi, 1510 m). **6)** Parameres, dorsal view (drawing by Ivo Gudenzi). **7)** Parameres, lateral view (drawing by Ivo Gudenzi). **8)** lamella copulatrix.

Distribution. Turkey, Iraq, Iran (Löbl et al. 2006). Syria (Kabakov, 2006)

Material examined. IRAN: "Persia", 1 male (paralectotype, MNHN); Eşfahān prov., Zāghel, 21.v.1977, 1 male (Baraud collection, MNHN); "Dasht-Arghan", 30.iv.1971, R. Naviaux leg. 1 male (Baraud collection, MNHN); Lorestān prov., Zagros Mts., Nehāvand Kosio Āb, 1860 m, 6.v.2008, T. Hác, K. Székely and K. Vig leg. 8 males and 6 females (LNCB), and 2 males (SZCM); Lorestān prov., Bongale, 1600 m, 15.iv.1999, L. Nadai leg. 1 female (SZCM); Büyer Ahmad prov., 3 km N Sisaht, 2700 m, 10.v.1998, G. Fábán and K. Székely leg. 1 male (SZCM); Lorestān prov., 10 km SW Dorud, 1400 m, 10.v.2002, D. Gianasso leg. 1 female (SZCM); Lorestān prov., Kuh-e Oshturan, 2000 m, 22.v.2005, G. Sama leg.

1 female (SZCM); Lorestān prov., Azna, Arak, 2083 m, 22.v.2005, G. Sama leg. 1 male (SZCM). IRAQ: “Mesopotamie”, 1 male and 1 female (lectotype and paralectotype, MNHN). SYRIA: “Syrie”, 1 female (Baraud collection, MNHN). TURKEY: Niğde prov., Aladağlar, 2000 m, 26.vii.1990, C. Thomè leg. 1 female (Baraud collection, MNHN); Adıyaman prov., Nemrut Dağı, 1.v.1998, 1 male (SZCM); Malatya prov., Reşadiye geçidi, 1510 m, 13.iv.2004, S. and R. Ziani leg. 64 males and 45 females (SZCM); Malatya prov., 10 km S Tepehan, 1200 m, S. and R. Ziani leg. 1 male and 2 females (SZCM); Gümüşhane prov., Bayburt, 2000 m, 3.vii.1992, S. and R. Ziani leg. 2 males and 4 females (SZCM); Erzurum prov., Kop Dağı geçidi–Kandilli, 2500 m, 3.vii.1992, S. and R. Ziani leg. 4 males and 3 females (SZCM); Hakkâri prov., Uludere, 16.iv.2006, S. and R. Ziani leg. 1 female (SZCM); Siirt prov., 10 km N Şırnak, 1500 m, 16.iv.2006, S. and R. Ziani leg. 1 female (SZCM).

Remarks. The record of *O. lemuroides* from Syria appears doubtful. Kabakov (2006) stated to have examined two females labelled generically Syria, and “Syrie” is also on the label of a specimen I studied in MNHN. Most probably Syria is to be considered in its historical sense, i.e. those territories once encompassed in the Ottoman Empire, presently belonging to Turkey.

***Onthophagus (Palaeonthophagus) fortigibber* Reitter, 1909**

(Fig. 9–14)

Onthophagus tricusps Semenov, 1900: 93 [type locality: “Caucasus centralis: Mlety” [Mleta, Georgia]; type material: holotype male, fixed by monotypy, not examined, in Russian Academy of Science, S. Petersburg, according to Balthasar 1963], not *O. coenobita* var. *tricusps* Mulsant, 1842: 128; Olsoufieff 1900: 274; d’Orbigny 1900: 296 (as junior synonym of *O. lemuroides*); Reitter 1906: 729; Olsoufieff 1918: 81; Boucomont 1924: 114; Boucomont and Gillet 1927: 129; Winkler 1929: 1031; Balthasar 1963: 560; Petrovitz 1963: 238; 1968: 465; Carpaneto 1977: 40; Dzhambazishvili 1979: 145; Rössner 1991: 267; Carpaneto et al. 2000: 231; Tauzin 2001: 113

Onthophagus (Palaeonthophagus) tricusps: Baraud 1992: 384

Onthophagus fortigibber Reitter, 1909: 79; Olsoufieff 1918: 81 (as junior synonym of *Onthophagus tricusps* Semenov, 1900); Medvedev 1965: 188; Zunino 1978: 84 (as junior synonym of *O. tricusps*); Rössner, 1991: 267 (as junior synonym of *O. tricusps*)

Onthophagus (Palaeonthophagus) fortigibber: Shokhin 2000: 6; Löbl et al. 2006: 167; Kabakov 2006: 193; Shokhin 2007: 124

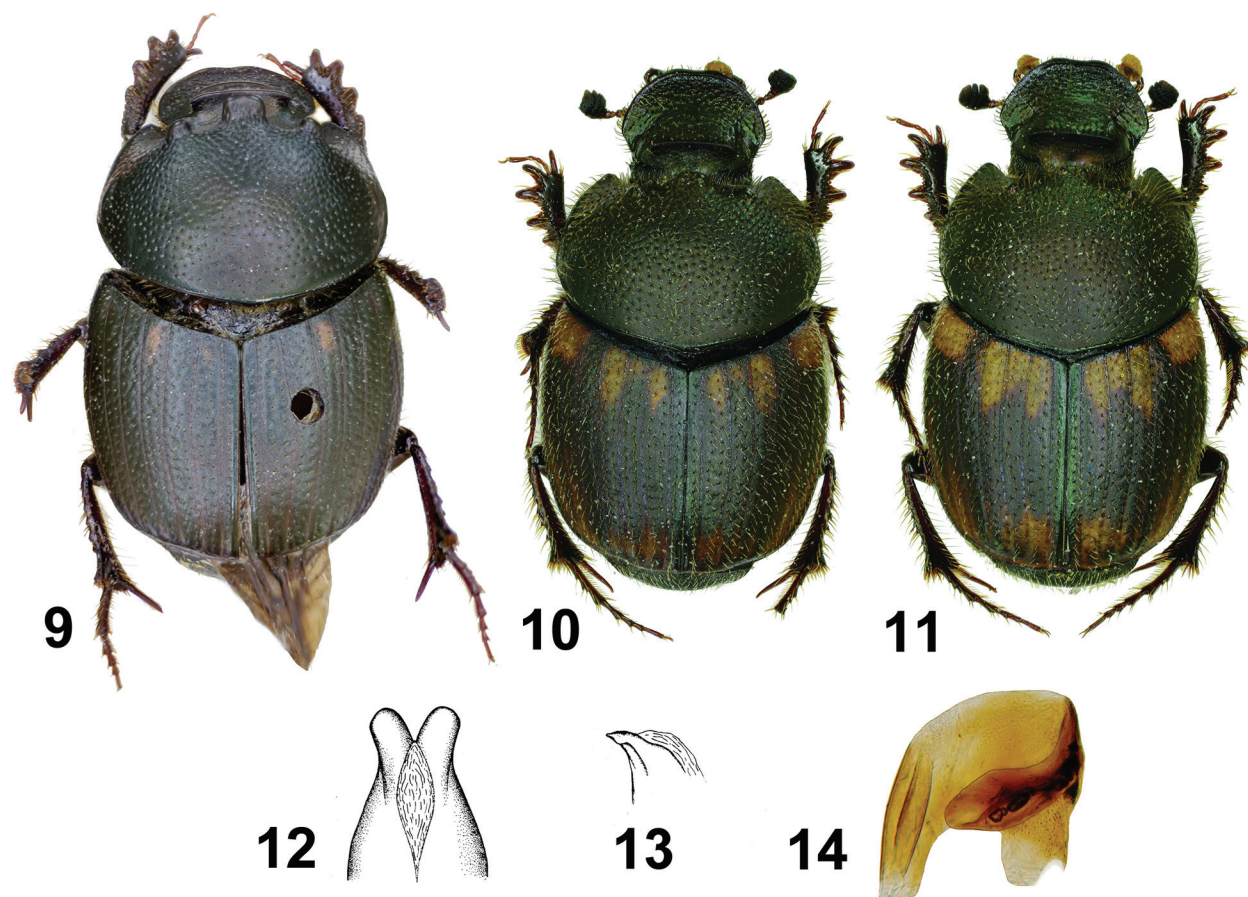
Onthophagus unxovi Bogachev, 1930: 87 [type locality: “Vezuri, prope Lesora, Ossetia meridionalis (distr. Rača)” [Racha, Georgia]; type material: lectotype male (designated by Tarasov 2005) and 7 paralectotypes, not examined, in the Zoological collection of MGU, Moscow, according to Tarasov 2005]; Balthasar 1963: 572 (as *O. unxovi*, incorrect subsequent spelling); Tarasov 2005: 257 (as junior synonym of *O. fortigibber*)

Type locality. For *O. fortigibber* “Aus dem zentralen Kaukasus: Umgebung von Wladikawkas” [Vladikavkaz, North Ossetia-Alania, southern Russia].

Type material. Holotype, for *O. fortigibber*, fixed by monotypy, a male according to the author (actually a female), in HHNM (examined).

Diagnostic features. Length 5.5 to 8.0 mm. Color blackish brown, poorly shiny due to distinct micro-reticulation; elytra blackish brown with basal reddish yellow spots on 2nd and 4th interstriae (holotype), some specimens with spots on base of 3rd and 6th/7th interstriae, some with an additional humeral spot—5th interstria always without basal spot, 1st interstria always blackish brown along entire length, in all the examined specimens, some with apical spots, more or less joined and forming a single larger one extended over 2nd interstria to the side; some with nearly the entire elytral surface, except disc, dark yellow (Fig. 9–11); pubescence pale yellow.

Head with clypeus broadly round on either side of shallow median emargination, barely sinuate near obviously produced genae. Clypeofrontal carina weak or absent in males, moderately elevate but



Figures 9-14. *Onthophagus (Palaeonthophagus) fortigibber* Reitter, 1909. **9)** Holotype female. **10-11)** Males (TR-Gümüşhane, Zigana geçidi, 2100 m). **12)** Parameres, dorsal view (drawing by Ivo Gudenzi). **13)** Parameres, lateral view (drawing by Ivo Gudenzi). **14)** Lamella copulatrix.

distinct, bent backward in females; occipital carina distinct in both sexes, extended in an erect straight lamina, only slightly bent backward in males. Clypeal and frontal surface with large setigerous punctures, more widely spaced on frons than on clypeus in males; females only with frontal surface simply punctate, clypeal surface with very coarse, transversely rugose or sub-rugose punctures. Setae long and erect.

Pronotum convex, declivous anteriorly, with distinct anterolateral tubercle on either side and with an anteromedian round prominence, clearly projecting further forward than the anterolateral tubercles. Anterior angles distinctly produced, sides not or very indistinctly sinuate behind them. Dorsal surface setigerously punctate, punctures broad, sub-regular in distribution, separated by 1–3 diameters on disc, gradually becoming sparser toward base; each puncture bears a small granule at its anterior margin, and a long pale yellow seta.

Elytral striae shiny, barely impressed, with punctures slightly larger than strial width and barely crenating interstrial sides. Interstriae flat to barely convex, all, except the sutural interstria, rather regularly biserially granulate; granules slightly smaller than strial punctures; posterior margin of each granule with a small, indistinct, setigerous puncture; setae pale yellow, thin, shorter than pronotal ones.

Pygidium with widely spaced, setigerous punctures; setae yellow, long, thin.

Inner angle of protibial apex with a small denticle strongly curved downward in males, lacking denticle in females.

Parameres (Fig. 12–13) short, barely sinuate along sides, latero-apical spatulae bent ventrally, not or very slightly diverging apically, without latero-proximal denticle, latero-apical angle round. Lamella

copulatrix (Fig. 14) horseshoe shaped and clearly emarginate at one side, right lobe with a strongly sclerotized plica ventrally bent.

Distribution. Georgia, Azerbaijan, South Russia, Ukraine. Turkey (Löbl et al. 2006).

Material examined. RUSSIA: “Sakka Tschmi”, “Umg. Wladikaw / kas”, 16.vii.1907, 1 female (holotype, HNHM); “Cauc. centr. / Ossetia / Lars”, 31.v.1913, 2 females (MNHN). TURKEY: Gümüşhane prov., Bayburt, 2000 m, 3.vii.1992, S. and R. Ziani leg. 1 male (SZCM); Gümüşhane prov., Zigana geçidi, 2100 m, 19.vi.1992, A. Ballerio leg. 2 males and 1 female (SZCM).

Remarks. Most probably the record of *O. fortigibber* from Ukraine derives from an incorrect placement of its type locality. “Wladikawkas”, presently Vladicavkaz, is a town in the Republic of North Ossetia-Alania, southern Russia, not, as stated by Zunino (1978), in the Ukraine.

Discussion

Onthophagus lemuroides and *O. fortigibber* are unquestionably two good species, due mainly to the different shape of the paramere apices, the different cephalic structure of major males, and the different coloration of the elytra. Nevertheless some chromatic varieties are similar and, considering pronotal development in males and females of both species are also similar, it may not be easy to distinguish the two taxa.

Thus, couplet 648–721 in Balthasar’s (1963) key to the *Onthophagus* species, which only considers elytral coloration, will not work for many specimens: “Flügeldecken auf hellem Untergrund dunkel gefleckt oder gezeichnet, selten fast ganz dunkel oder hellbraun” for *O. lemuroides* and “Flügeldecken auf dunklem Untergrund hell gefleckt oder gezeichnet selten sind die Flügeldecken vollkommen gelb bis rotbraun, oder sie sind teilweise metallisch gefärbt” for *O. fortigibber* (as *O. tricuspsis*). Also Kabakov’s (2006) key to the lemur group considered only their coloration differences, ascribing to *O. lemuroides* elytra ochreous-yellow, with symmetrical dark small spots rarely absent, and to *O. fortigibber* elytra black or dark brown, with yellow or dark red spots or without them. The variety of *O. lemuroides* with elytra completely black (Fig. 5), quite common in Turkey, is not included in Kabakov’s key.

Petrovitz (1968) pointed out two remarkable chromatic varieties in the species: a “f. *flavipennis*” of *O. fortigibber* (as *O. tricuspsis*), with the elytra, including epipleurae, completely yellow, except for the juxtasutural stria and a black spot in the basal third of 7th interstria, and a “f. *nigra*” of *O. lemuroides*, with the elytra completely black.

I have never seen specimens of *O. fortigibber* with elytra totally yellow, as cited by Petrovitz (1968). All the specimens examined by me have elytra more or less yellow, but always with a black basal spot on the 5th elytral interstria (Fig. 10; 11). The variety with elytra almost without black spots (Fig. 4) is common among specimens of *O. lemuroides*.

A study of the lamellae copulatrices as a tool for discriminating, contrary to other *Onthophagus* species, is not at all useful to distinguish *O. lemuroides* and *O. fortigibber*, the pieces of the two species being very similar (Fig. 8; 14). On the contrary, apices of parameres (Fig. 6–7; 12–13) show constant differences between *O. lemuroides* and *O. fortigibber*, and can be decisive for recognizing the two taxa.

The following key provides an instrument for distinguishing *O. lemuroides* and *O. fortigibber* without using the presence or the absence of maculation on elytra. I believe it is useful to include two other similar species, i.e. *Onthophagus lemur* and *O. trigibber*. This is not meant to imply a phyletic relationship between these species. Such a phylogenetic hypothesis is beyond the aim of this work.

Key to the species morphologically similar to *Onthophagus lemur* (Fabricius, 1781)

1. Occipital carina of the head with a transverse erect lamina, sometimes ending in a pair of vertical horns in male. Pronotum declivous anteriorly in both sexes, with an anterolateral tubercle on each side and an anteromedian gibbosity; pronotal anterior angles clearly produced, sides not or indistinctly sinuate behind them; inner angle of protibial apex with a small denticle strongly curved downward in male; pubescence yellow; length from 4.0 to 8.0 mm. **2**
- Not all the above characters present simultaneously.. **all other *Palaeonthophagus* Zunino**

- 2(1) Pronotum granulate on disc, granules sub-regular, separated from 0.5–1.0 times their diameter; major males occipital carina with a straight erect lamina, never ending in two horns; southern Europe, Middle East. ***O. lemur* (Fabricius)**
- Pronotum punctate on disc, punctures sometimes bearing a small granule at their anterior margin, separated from 1–2 times their diameter; major males occipital carina either with an erect lamina slightly bent backward or with a lamina ending in two vertical horns. **3**

- 3(2) Occipital carina extending at base to inner edge of eyes; pronotal anterolateral tubercles turned inward; pronotal anteromedian gibbosity clearly sinuate at base; Morocco, Algeria, Tunisia. ***O. trigibber* Reitter**
- Occipital carina clearly not extended at base from side to side of the head; pronotal anterolateral tubercles facing forward or turned slightly outward; pronotal anteromedian gibbosity slightly or not at all sinuate. **4**

- 4(3) Head with clypeus distinctly emarginate at middle; occipital carina in major males with an erect lamina ending in a pair of vertical horns; Turkey, Iraq, Iran. ***O. lemuroides* d'Orbigny**
- Head with clypeus barely emarginate at middle; occipital carina in major males with an erect lamina never ending in a pair of vertical horns; Caucasus, northern Russia, Turkey. ***O. fortigibber* Reitter**

Acknowledgments

Antoine Mantilleri and Olivier Montreuil (Muséum National d'Histoire Naturelle, Paris, France), and Otto Merkl (Termesztudományi Múzeum Allattára, Budapest, Hungary) provided specimens from the collections under their care. László Náday (Budapest, Hungary) loaned me material of his private collection. Augusto Degiovanni (Bubano di Mordano, Bologna, Italy) took all the photos of the specimens, and Gabriele Fiumi (Forlì, Italy) made them publishable. Ivo Gudenzi (Forlì, Italy) did the drawings. Alexander Napolov (Riga, Latvia) gave me his support in translation and transliteration of some texts and some names from Russian. Eckehard Rössner (Schwerin, Germany) has checked some information. Paul Schoolmeesters (Herent, Belgium) provided rare literature. Tristão Branco (Porto, Portugal), Marco Dellacasa (Museo di Storia naturale e del Territorio, Università di Pisa, Calci, Italy) and Paul Skelley (Florida State Collection of Arthropods, Gainesville, U.S.A.) have read and improved the last version of the manuscript. I am grateful to them all.

Literature Cited

- Balthasar, V. 1963.** Monographie der Scarabaeidae und Aphodiidae der palaearktischen und orientalischen Region. Coleoptera Lamellicornia. Band 2. Coprinae (Onitini, Oniticellini, Onthophagini). Tschechoslowakischen Akademie der Wissenschaften; Prag. 627 p., 16 pls.

- Baraud, J. 1992.** Coléoptères Scarabaeoidea d'Europe. Faune de France et régions limitrophes. 78. Fédération française des Sociétés de Sciences naturelles and Société linnéenne de Lyon; Paris-Lyon. ix + 856 p., 11 pls.
- Bogachev, A. V. 1930.** Novyj vid iz roda *Onthophagus* Latr. Species nova generis *Onthophagus* Latr. Izvestiya Azerbayzhanskogo Gosudarstvennogo Universiteta Imeni V. I. Lenina. Otdel "Estestvoznaniye i Medicina". Baku 9: 87–88.
- Boucomont, A. 1924.** Synonymies et homonymies de Lamellicornes Coprophages (Col.). Bulletin de la Société Entomologique de France 29: 114–115.
- Boucomont, A., and J. J. -E. Gillet. 1927.** Fam. Scarabaeidae. Subfam. Coprinae II. Partes 38 et 90. Coleopterorum Catalogus Vol. 19 (3): 103–263.
- Carpaneto, G. M. 1977.** Ricerche faunistiche, ecologiche e zoogeografiche sui Coleotteri Scarabaeoidea Laparosticti dell'Asia Minore. Tesi di Laurea, relatore prof. V. Sbordonì, Facoltà di Scienze, Università "La Sapienza; Roma. 172 p.
- Carpaneto, G. M., E. Piattella, and R. Pittino. 2000.** The scarab beetles of Turkey: an updated checklist and chorotype analysis (Coleoptera, Scarabaeoidea). Biogeographia. 21: 217–240.
- Dzhambazishvili, Y. S. 1979.** Plastinchatousye zhuki Gruzii. Metsniereba; Tblisi. 275 p.
- Kabakov, O. N. 2006.** Plastinchatousye zhuki podsemeystva Scarabaeinae (Insecta: Coleoptera: Scarabaeidae) fauny Rossii i sopredel'nykh stran. Tovarishchestvo nauchnykh izdaniy KMK; Moscow. 374 p.
- Löbl, I., F.-T. Krell, S. Ziani, and D. Kral. 2006.** Scarabaeidae, subfamily Scarabaeinae, tribe Onthophagini. p. 159–176. In: I. Löbl and A. Smetana (eds). Catalogue of Palaearctic Coleoptera. Volume 3. Scarabaeoidea–Scirtoidea–Dascilloidea–Buprestoidea–Byrrhoidea. Apollo Books; Stenstrup. 690 p.
- Medvedev, S. I. 1965.** Scarabaeidae-Plastinchatousye. p. 166–208. In: G. J. Bej-Bienko (ed.). Opredelitel' Nasekomykh evropejskoj casti S.S.S.R. Nauka Ed.; Moscow-Leningrad 2. 668 p.
- Mulsant, E. 1842.** Histoire naturelle des Coléoptères de France. Lamellicornes. Maisson; Paris and Ch.Savy Jeune; Lyon. viii + 623 p., 3 pls.
- Olsofiev, G. 1900.** Notes sur les Onthophagides paléarctiques. I. Annuaire du Musée Zoologique de l'Académie Impériale de Sciences 5: 266–275.
- Olsofiev, G. 1918.** Les Coprophages de la Caucasic. Mémoires du Musée du Caucase 7: 1–92.
- Orbigny, H. d'. 1898a.** Descriptions d'espèces nouvelles d'*Onthophagus* (Col.) de Mésopotamie et d'Arabie (1). Bulletin de la Société Entomologique de France 8: 177–180.
- Orbigny, H. d'. 1898b.** Synopsis des Onthophagides paléarctiques. L'Abeille 29: 117–254.
- Orbigny, H. d'. 1900.** Supplément au synopsis des Onthophagides paléarctiques. L'Abeille 29: 289–300.
- Petrovitz, R. 1963.** Neue und interessante Scarabaeidae aus dem vorderen Orient. II Teil. Reichenbachia 1 (28): 235–267.
- Petrovitz, R. 1968.** Ergebnisse zoologischer Sammelreisen in der Türkei. Lamellicornia, Coleoptera. Annalen des Naturhistorischen Museums; Wien 72: 465–491.
- Reitter, E. 1906.** Scarabaeidae. p. 714–750. In: L. Heyden, E. Reitter and J. Weise. Catalogus Coleopterorum Europae, Caucasi et Armeniae Rossicae. Edmund Reitter; Berlin, Paskau., Caen 2: 774 p.
- Reitter, E. 1909.** Eine Serie neuer Scarabaeiden aus der paläarktischen Fauna (Coleoptera). Wiener Entomologische Zeitung 28: 75–84.
- Rössner, E. 1991.** Zur Fauna der Scarabaeoidea (Coleoptera) des Kaukasus-Gebietes. Entomologische Nachrichten und Berichte 35 (4): 265–268.
- Semenov, A. 1900.** Coleoptera Nova Rossiae Europaeae Caucasicae. Horae Societatis Entomologicae Rossicae 34: 88–95.
- Shokhin, I. V. 2000.** Plastinchatousye Zhuki (Coleoptera, Scarabaeoidea) Yuzhnoj Rossii. Avtoreferat-Dnssertatsii Na Sonskanie Uchenoj Stepeni Kandidata Bnolorncheskikh Naur: 3–21.
- Shokhin, I. V. 2007.** Contribution to the fauna of lamellicorn beetles (Coleoptera, Scarabaeoidea) of Southern Russia, with some nomenclatural changes in the family Scarabaeidae. Caucasian Entomological Bulletin 3 (2): 105–185.
- Tarasov, S. I. 2005.** On the taxonomic status of *Onthophagus unxovi* Bogachev, 1930 (Coleoptera, Scarabaeidae). Euroasian Entomological Journal 4 (3): 257.
- Tauzin, P. 2001.** Coléoptères Scarabaeoidea de Turquie: deuxième note. Le Coléoptériste 42: 111–118.

- Winkler, A. 1929.** Catalogus Coleopterorum regionis palaearcticae (1924–1932). Scarabaeidae. Wien 9: 1009–1136.
- Zunino, M. 1975.** Revisione delle specie paleartiche del sottogenere *Onthophagus* (sensu strictu) Latr. (Coleoptera, Scarabaeoidea). I tipi di H. d'Orbigny, A. Raffray e A. Boucomont nel Museum National d'Histoire Naturelle di Parigi. Bollettino del Museo di Zoologia dell'Università di Torino 7: 151–194.
- Zunino, M. 1978.** Revisione delle specie paleartiche del sottogenere *Onthophagus* (sensu strictu) Latr. (Coleoptera, Scarabaeoidea). I tipi di E. Reitter ed E. Csiki. Bollettino del Museo di Zoologia dell'Università di Torino 6: 75–122.
- Zunino, M. 1979.** Gruppi artificiali e gruppi naturali negli *Onthophagus*. Bollettino del Museo Regionale di Scienze Naturali 1: 1–18.

Received January 30, 2012; Accepted March 5, 2012.

