

Giovanni DELLACASA, Marco DELLACASA & Stefano ZIANI

**TAXONOMIC POSITION OF *APHODIUS TURBATUS* BAUDI, 1870 AND  
SYSTEMATIC REDEFINITION OF *APHODIUS ISIKDAGENSIS* BALTHASAR,  
1952 (COLEOPTERA SCARABAEOIDEA, APHODIIDAE)**

**ABSTRACT** – The new synonymy of *Aphodius lineimargo* Reitter, 1893 versus *Aphodius turbatus* Baudi, 1870 (lectotype herein designated), is established. The redescription of the latter as well as that of its sibling species *Aphodius strigimargo* Reitter, 1892 are supplied.

The synonymy of the subgenus *Ataeniomorphus* Balthasar, 1952 versus *Liothorax* Motschulsky, 1859, proposed by Stebnicka (1990), is confirmed. *Aphodius isikdagensis* Balthasar, 1952 is restored as good species and the new synonymies of *Aphodius resslii* Petrovitz, 1962 and *Aphodius cypricola* Balthasar, 1971 versus *isikdagensis* are established on the basis of type material study.

Dichotomical keys to *Alocoderus* and *Liothorax* taxa herein dealt are supplied.

**RIASSUNTO** – *Posizione tassonomica di Aphodius turbatus Baudi, 1870 e ridefnizione sistematica di Aphodius isikdagensis Balthasar, 1952 (Coleoptera Scarabaeoidea, Aphodiidae).*

E' stabilita la nuova sinonimia di *Aphodius lineimargo* Reitter, 1893 versus *Aphodius turbatus* Baudi, 1870 di cui è anche designato il lectotipo; vengono inoltre fornite sia la sua ridescrizione sia quella della specie affine *Aphodius strigimargo* Reitter, 1892. E' confermata la sinonimia del sottogenere *Ataeniomorphus* Balthasar, 1952 versus *Liothorax* Motschulsky, 1859, proposta da Stebnicka (1990). *Aphodius isikdagensis* Balthasar, 1952 è riconsiderato *bona species* e vengono stabilite le nuove sinonimie di *Aphodius resslii* Petrovitz, 1962 ed *Aphodius cypricola* Balthasar, 1971 versus *isikdagensis* in base allo studio dei tipi.

Sono infine rielaborate le chiavi dicotomiche dei taxa di *Alocoderus* e di *Liothorax* qui trattati.

**KEY WORDS:** Scarabaeoidea, Aphodiidae, *A. turbatus*, *A. isikdagensis*, systematics, nomenclature.

To complete the faunistic work on coprophagous Scarabaeoidea of Cyprus, one of us (Ziani, 1997) had to study the material preserved in Baudi's collection at Turin Museum, including the typical series of *Aphodius turbatus* Baudi, 1870. Identified as *Aphodius plagiatus* "varietas" therein he also found five specimens which, at that time, he considered identical to *Aphodius resslii* Petrovitz, 1962.

For the systematic redefinition of said taxa we had to study the types of all species which might be taxonomically close to either *Aphodius turbatus* or *Aphodius resslii*, i.e.: *Aphodius antilibanonicus* Balthasar and *Aphodius lineimargo* Reitter (sibling species of *A. turbatus*) as well as *Aphodius cypricola* Balthasar and *Aphodius isikdagensis* Balthasar (sibling species of *A. resslii*).

Unfortunately we were not able to find the type of *Aphodius strigimargo* Reitter (a taxon close to *A. lineimargo*) but we examined several specimens probably pertaining to Reitter's typical material.

We had also the opportunity to study the holotype of *Aphodius jakutorum* Balthasar, 1938 described from "Bestjach bei Jakutsk", and we confirm doubtless its synonymy versus *Aphodius plagiatus* (Linné, 1767) as already stated by Balthasar himself (1964: 422).

The results of our study follow.

*Aphodius (Alocoderus) turbatus* Baudi, 1870 (figs. 1-3)

1870. *Aphodius turbatus* Baudi, Berl. ent. Zeits., 14: 66  
 1891. *Aphodius (Alocoderus) turbatus*; Baudi, Cat. Col. Europae coll. meae, 1: 179 (*manuscript*)  
 1893. *Aphodius (Melinopterus) lineimargo* Reitter, Verh. Ver. Brünn, 31: 106  
 1913. *Aphodius (Alocoderus) lineimargo*; A. Schmidt, Arch. Naturg., 79A (11): 127  
 1961. *Aphodius (Alocoderus) antilibanonicus* Balthasar, Acta ent. Mus. nat. Pragae, 34: 366 (**new synonymy**)  
 1964. *Aphodius (Bodilus) turbatus*; Balthasar, Mon. Scar. Aphod. Pal. Or. Region, 3: 405 (doubtfully as junior synonym of *immundus* Creutzer, 1799)  
 1988. *Aphodius (Bodilus) turbatus*; M. Dellacasa, Mem. Soc. ent. ital., 66 (1987): 211, 373 (as *bona species*)  
 1997. *Aphodius (Alocoderus) turbatus*; Ziani, Biocosme mes., 14: 20

TYPE LOCALITY: "Insula Cypro"

TYPE DEPOSITORY: Museo regionale di Scienze naturali. Turin (lectotype examined)

DESCRIPTION: length 5-7 mm; elongate, convex, glabrous; head and pronotum moderately shiny, elytra dull. Reddish-brown; front, disc and two rounded small lateral spots on pronotum and elytral suture dark brown. Head with epistome gibbous, rather coarsely and regularly punctured; clypeus faintly sinuate at middle, rounded at sides, thinly bordered, border feebly upturned; genae obtusely rounded, elongately ciliate, no more protruding than eyes; frontal suture cariniform, feebly tuberculate; front rather finely and sparsely punctured. Pronotum convex, transverse, rather sparsely, finely and almost regularly punctured; front margin distinctly bordered; sides feebly rounded, thickly bordered, border sparsely ciliate; base faintly bisinuate, thickly bordered. Scutellum triangularly elongate, sides arcuate, apically acuminate, densely and coarsely punctured on basal half. Elytra oval-elongate, moderately convex, not denticulate at shoulder, finely striate; striae rather superficially punctured, faintly crenulate; interstices flat, strongly microreticulate thus almost dull, very finely and sparsely punctured. Fore tibiae distally tridentate and proximally faintly serrulate at outer margin, their upper side smooth. Middle and hind tibiae with strong transverse carinae on outer face; apically fimbriate with alternately unequal spinules. Hind tibiae superior apical spur as long as first tarsal segment; latter as long as following two combined. Male: median tubercle of frontal suture relatively stronger, subconical; pronotum more convex, not narrowed anteriorly; elytra nearly parallel-sided. Female: median tubercle of frontal suture relatively weaker; pronotum less convex, narrowed anteriorly; elytra feebly broadened backward.

DISTRIBUTION: Cyprus, Egypt, Iran, Iraq, Israel, Jordan, Libya, Syria, Turkey.

ASCERTAINED GEONOMY: **Cyprus**: Insula Cypro (without more detailed locality label), (**lectotype** male **herein designated** and six paralectotypes; Baudi Collection, Turin Museum); Kyrenia, Larnaka env.; **Iran**: Dasht-arjan, Shiraz; Evine, Teheran; Kazeroon, Shiraz; Korrud, Persepoli; Kurdistan Prov., Luristan (without more detailed locality label); Mauradan/Zeudjan; Pass Zagheh, Khurang. **Iraq**: Mosul. **Jordan**: Amman; Fuhes; Jordantal Deir Alla; Wadi Sir. **Libya**: Cyrenaica: Ain Messa; Ain Sciahhat; Bir el-Abrah; Gasr el-Ebia; Ras el-Hilal; Zauia el-Faidia. **Syria**: Aleppo; Bang Haas; Kaifa (**paratype** of *lineimargo*; Budapest Museum); Zebdani, Anti-Libanon (**holotype** of *antilibanonicus*; Balthasar Collection, Prague Museum). **Turkey**: Vil. Amasya: Amasya (**holotype** of *lineimargo*; Budapest Museum); Vil. Ankara: umg. Ankara; Vil. Bingöl: Kurucu Geç;

Vil. Edirne: Süloğlu; Vil. Elaziğ: Elaziğ; Vil. Gaziantep: Burç, Gaziantep, Karakuyu, Kilis, Yavuzeli; Vil. Kahramanmaraş: Kahramanmaraş; Vil. Kayseri: Aşağıkısılçevlik, Karahalka, Saysallı, Ziyarettepesi Geç.; Vil. Konya: Karapınar, Konya, Yeşilköy; Vil. Malatya: Levent, Malatya; Vil. Mardin: Mardin; Vil. Van: Özalp.

REMARKS: Baudi (1870) described this species based on seven specimens from Cyprus, without more detailed locality label. Balthasar (1964), though doubtfully, synonymized *turbatus* with *immundus* Creutzer, 1799. M. Dellacasa (1988) restored the former as valid species but ascribed it to subgenus *Bodilus*. We had the opportunity to study the types both of *turbatus* and *lineimargo*, and herein we confirm the synonymy of the latter versus the former as already stated by one of us (Ziani, 1997).

Furthermore we examined the holotype of *Aphodius antilibanonicus* Balthasar, 1961 and doubtless we ascertained its synonymy versus *Aphodius turbatus* Baudi, 1870.

*Aphodius (Alocoderus) strigimargo* Reitter, 1892 (figs. 4-6)

1892. *Aphodius (Melinopterus) strigimargo* Reitter, Verh. Ver. Brünn, 30: 238

1894. *Aphodius (Amidorus) fronticornis* D. Koshantschikov, Horae Soc. ent. Ross., 28: 114

1913. *Aphodius (Alocoderus) strigimargo*; A. Schmidt, Arch. Naturg., 79A (11): 127

TYPE LOCALITY: "Margelan, Turkestan"

TYPE DEPOSITORY: unknown to authors

DESCRIPTION: length 5-6.5 mm, elongate, convex, moderately shiny, glabrous. Brown-yellowish; head posteriorly, disc and two small rounded lateral spots on pronotum and elytral suture dark brownish; legs and antennae pale brownish. Head with epistome gibbous, densely, regularly and rather coarsely punctured; clypeus feebly sinuate at middle, rounded at sides, finely bordered, border nearly glabrous; genae rounded, elongately ciliate, no more protruding than eyes; latter rather large; frontal suture cariniform, feebly tuberculate; front less densely punctured than epistome. Pronotum convex, transverse, densely, irregularly and rather coarsely punctured; front margin distinctly bordered; sides feebly rounded, very thinly bordered, border sparsely ciliate; hind angles obtusely rounded; base faintly bisinuate, rather thickly bordered. Scutellum triangularly elongate, with sides arcuate, apically acuminate; densely coarsely punctured on basal half. Elytra regularly oval, not denticulate at shoulder, rather finely striate; striae superficially punctured, faintly crenulate; interstices feebly but distinctly convex, superficially microreticulate thus rather shiny, with two almost regular longitudinal rows of rather coarse punctures near striae. Fore tibiae distally tridentate and proximally faintly serrulate at outer margin; upper side shiny and smooth. Middle and hind tibiae with strong transverse carinae on outer face; fimbriate with alternately unequal apical spinules. Hind tibiae superior apical spur as long as first tarsal segment; latter shorter than following two combined. Male: median tubercle of frontal suture relatively stronger, somewhat bifid at tip; pronotum more convex, not narrowed frontward; elytra nearly parallel-sided. Female: median tubercle of frontal suture relatively weaker; pronotum less convex, narrowed frontward; elytra feebly broadened backward.

DISTRIBUTION: Kazakhstan, Turkmenistan, Uzbekistan

ASCERTAINED GEONOMY: **Kazakhstan:** 60km E of Chardana. **Turkmenistan:** Merv. env., Badchys Nat. Park, Kizil Dschar ref.. **Uzbekistan:** Jangi Kuduk, Buchara; Taschkend; Lac Tus-Kane (type locality of *Aphodius fronticornis* D. Koshantschikov, 1894).

REMARKS: The synonymy of *Aphodius fronticornis* D. Koshantschikov, 1894 versus *Aphodius strigimargo* Reitter, 1892 was established by A. Schmidt (1913: 127) with reference "nach brieflicher Mitteilung des Herrn W. Koshantschikoff in Ligovo".

DICHOTOMICAL KEY TO *ALOCODERUS* TAXA DISCUSSED HEREIN

- 1 Elytral interstices flat, strongly microreticulate, thus almost dull, faintly punctured; pronotum rather sparsely, finely and nearly regularly punctured; first segment of hind tarsi as long as following two combined. Reddish-brown; front, disc and two small rounded lateral spots on pronotum and elytral suture dark brown. Length 5-7 mm. Cyprus, Egypt, Iran, Iraq, Israel, Jordan, Libya, Syria, Turkey. ....  
 ..... (*antilibanonicus*, *lineimargo*) **turbatus**
- Elytral interstices feebly but distinctly convex, superficially microreticulate thus rather shiny; with almost regular longitudinal rows of coarse punctures near striae; pronotum densely, rather coarsely and irregularly punctured; first segment of hind tarsi shorter than following two combined. Brown-yellowish; head posteriorly, disc and two small rounded lateral spots on pronotum and elytral suture dark brownish. Length 5-6.5 mm. Kazakhstan, Turkmenistan, Uzbekistan. ....(*fronticornis*) **strigimargo**

*Aphodius (Liothorax) isikdagensis* Balthasar, 1952 (figs. 10-12)

1870. *Aphodius plagiatus* "varietas" Baudi, Berl. ent. Zeits., 14: 67  
 1891. *Aphodius plagiatus* "varietas"; Baudi, Cat. Coll. Eur., 1: 178 (*manuscript*)  
 1952. *Aphodius (Ataeniomorphus) isikdagensis* Balthasar, Acta ent. Mus. nat. Pragae, 28: 22  
 1962. *Aphodius (Ataeniomorphus) resslii* Petrovitz, Ent. Arb. Mus. Frey, 13: 126 (**new synonymy**)  
 1971. *Aphodius (Ataeniomorphus) cypricola* Balthasar, Beitr. Ent., Berlin, 21: 57 (**new synonymy**)  
 1990. *Aphodius (Ataeniomorphus) resslii*; Stebnicka, Revue Suisse Zool., 97: 897 (as junior synonym of *Aphodius (Liothorax) plagiatus* Linné, 1767)  
 1997. *Aphodius (Liothorax) resslii*; Ziani, Biocosme mes., 14: 25 (as *bona species*)

TYPE LOCALITY: "Anatolien: Çamlidere in Isik Dag" [Turkey].

TYPE DEPOSITORY: Narodni Muzeum prirodovedecke Muzeum. Praha (paratypes examined).

DESCRIPTION: length 3.5-4.5 mm; elongate, subcylindrical, head and pronotum moderately shiny; scutellum and elytra strongly microreticulate thus rather dull; glabrous. Blackish, sides and apex of elytra faintly reddish; sometimes elytra entirely reddish; legs reddish brown; antennae piceous. Head rather large; epistome strongly gibbous, superficially microreticulate, very finely punctured on disc, doubly and more coarsely punctured distally; clypeus feebly sinuate at middle, widely rounded at sides, very thinly bordered, border glabrous; genae rounded, shortly ciliate, faintly auriculate, feebly more protruding than eyes; frontal suture obsolete, indicate only by an impunctate line somewhat gibbous laterally; front distinctly, regularly punctured. Pronotum transverse, convex, nearly

parallel-sided; doubly punctured; smaller punctures scattered throughout; large punctures three to four times larger than small punctures, slightly denser and coarser laterally; lateral median callosity nearly impunctate; hind angles obtusely rounded; base rather thickly bordered till level of fifth elytral stria, at middle finely but distinctly bordered. Scutellum very small, pentagonal, parallel-sided at base, distinctly microreticulate, densely and coarsely punctured on basal half. Elytra elongate, subcylindrical; epipleural carina distinctly subdentiform at shoulder; striae fine, superficially punctured, feebly crenulate; interstices flat on disc, feebly convex apically, strongly microreticulate thus rather dull, nearly imperceptibly and sparsely punctured. Fore tibiae distally tridentate and proximally serrulate at outer margin; upper side smooth. Middle and hind tibiae with strong transverse carinae on outer face; apically fimbriate with short and equal spinules. Hind tibiae superior apical spur slightly shorter than first tarsal segment; latter as long as following two combined. Male: head with epistome relatively more strongly gibbous; pronotum not narrowed anteriorly, less densely and coarsely punctured; elytral interstices superficially microreticulate thus relatively more shiny; metasternal plate concave. Female: head with epistome relatively less gibbous; pronotum narrowed anteriorly, more densely and coarsely punctured; elytral interstices strongly microreticulate thus dull; metasternal plate flat.

DISTRIBUTION: Cyprus, Greece, Turkey

COLOUR VARIATIONS: *typical form*: blackish; elytra distally faintly reddish; *rutilipennis* (Helfer *in litt.*) Baudi, 1870: blackish; elytra entirely reddish (Cyprus).

ASCERTAINED GEONOMY: **Cyprus**: Insula Cypro (without more detailed locality label), (1 male and 4 females; Baudi Collection, Turin Museum); Umgebung von Larnaka (**holotype** of *cypricola*, Balthasar Collection, Prague Museum); Larnaka; Limassol. **Greece**: Graecia (without more detailed locality label; one male specimen, Bergamo Museum). **Turkey**: Vil. Ankara, Işık Dağ, Çamlidere (**paratypes** of *isikdagensis*, Balthasar Collection, Prague Museum); Vil. Hatay, Iskenderun (**holotype** female of *ressli*, Geneva Museum).

REMARKS: Balthasar (1952) created the subgenus *Ataeniomorphus* for elongate, subcylindrical taxa with large and strongly convex head resembling that of Eupariinae (since the etymology of the name), with clypeus widely rounded at sides and mutic frontal suture; pronotum finely but distinctly bordered; scutellum small, parallel-sided toward base; middle and hind tibiae fimbriate with short and equal apical spinules.

Balthasar himself, in the dichotomical key to subgenera of *Aphodius* (1964: 27) placed *Ataeniomorphus* in the same couple of *Calamosternus* because "Basis des Halsschildes deutlich gerandet". We have determined that, in spite of findings of previous authors, the taxa belonging to *Liothorax* generally present the basal margin of pronotum very thinly but distinctly bordered.

Balthasar ascribed to subgenus *Ataeniomorphus* his new species *Aphodius isikdagensis* (type species by original designation) described on four male and two female specimens from Işık Dağ, Çamlidere [Vil. Ankara, central Turkey]. Along with other morphological

characters of the new taxon, he mentioned "glanzend" and "Flügeldecken ohne Humeralzähnen".

Petrovitz (1962) described *Aphodius (Ataeniomorphus) resslī* from Iskenderun, Vil. Hatay [southeastern Turkey] based on one female specimen. Along with other morphological characters he mentioned "Kopf und Halsschild schwach glanzend, das Schildchen und die Flügeldecken durch Chagrinierung matt" and "Schultern mit kleinen, aber deutlichen Humeraldornen"; moreover comparing his new taxon with *isikdagensis* Balthasar, he reported "die bedorneten Schultern" as one of the discriminating characters.

Furtherly Balthasar (1964) changed the original diagnosis of *isikdagensis* stating: "Flügeldecken mit kaum sichtbaren Humeralzähnen" but anyway considered good species *Aphodius resslī* Petrovitz.

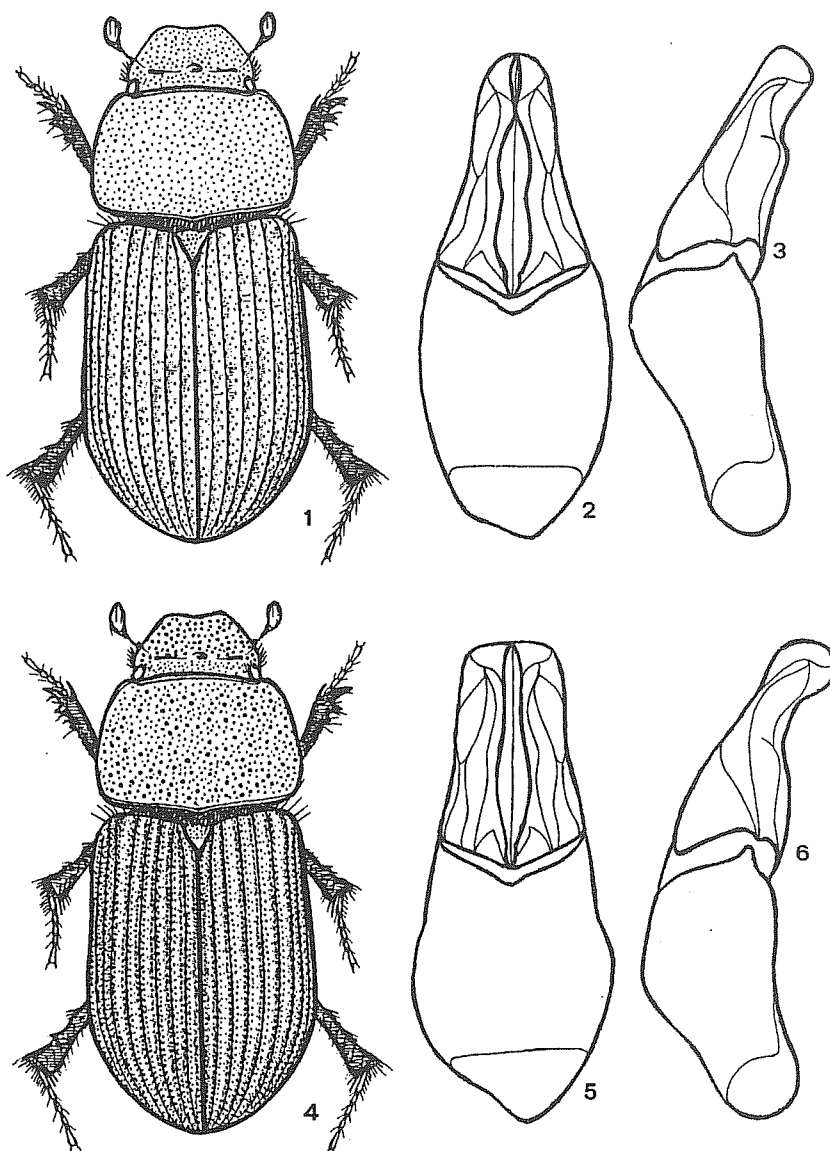
In 1971, Balthasar himself described *Aphodius (Ataeniomorphus) cypricola* from "Insel Cyprien, Umgebung von Larnaka" based on one male specimen distinguishing it from *resslī* by smaller size, by genae faintly more protruding than eyes and by elytral interstices quite flat. The thorough study of the holotype, a very small specimen with reddish elytra, allows to ascertain its synonymy versus *isikdagensis* Balthasar, 1952.

Stebnicka (1990) discussed the various taxonomical features of the species at that time considered pertaining to subgenus *Ataeniomorphus* and, on the basis of additional material at her disposal, proposed the synonymy of the subgenus *Ataeniomorphus* Balthasar, 1952 versus *Liothorax* Motschulsky, 1859 and of *Aphodius (Ataeniomorphus) isikdagensis* Balthasar, 1952 and *Aphodius (Ataeniomorphus) resslī* Petrovitz, 1962 versus *Aphodius (Liothorax) plagiatus* (Linné 1767).

We agree with Stebnicka in considering *Ataeniomorphus* junior synonym of *Liothorax*, but we cannot accept the synonymy of *isikdagensis* versus *plagiatus*. Effectively on the basis of Balthasar's type material, we found, in addition to external morphological characters, sufficiently significant aedeagal differences allowing to consider *Aphodius isikdagensis* Balthasar, 1952 as good species. Otherwise basing on type study, we can doubtless establish the synonymy of *Aphodius resslī* Petrovitz, 1962 versus the former.

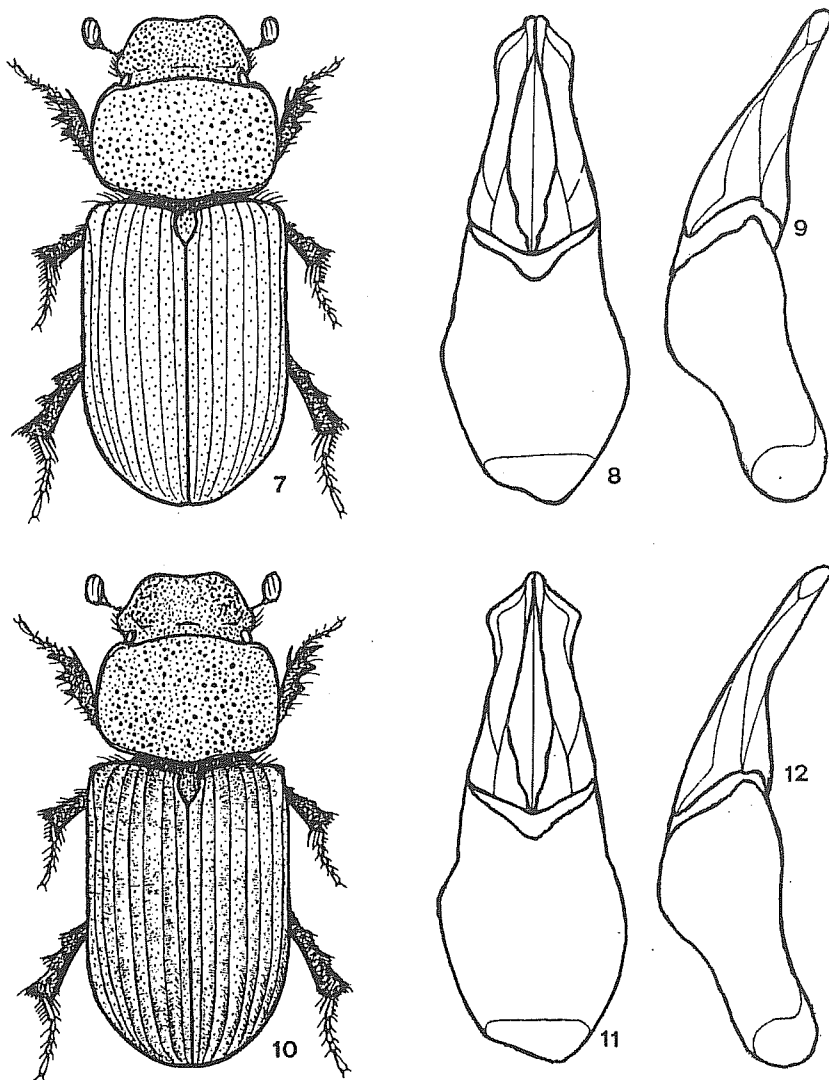
#### DICHOTOMICAL KEY TO *LIOTHORAX* TAXA DISCUSSED HEREIN

- 1 Epipleural carina faint at shoulder; genae not at all auriculate; epistomal and pronotal punctation few dense and moderately coarse; elytral interstices faintly microreticulate thus shiny; hind tibiae superior apical spur slightly longer than first tarsal segment, latter as long as following three combined (figs. 7-9). Blackish, elytra with oblique reddish strip, sometimes reduced to a small discal spot (ab. *parvomaculatus*); or elytra widely brown-yellowish, blackish at sides (ab. *discoïdes*) or entirely blackish with metallic reflex (ab. *elongatus*). Length 3-4.5 mm. Central and Southern Europe (Italy excepted); Tunisia, Israel, Jordan, Lebanon, Syria, Turkey, Iraq, Russia, Siberia. ....  
..... (*jakutorum*) **plagiatus**
- Epipleural carina distinctly subdentiform at shoulder; genae faintly auriculate; epistomal and pronotal punctation relatively denser and coarser; elytral interstices distinctly microreticulate thus more or less strongly dull; hind tibiae superior apical spur slightly shorter than first tarsal segment, latter as long as following two combined. Blackish; sometimes elytra reddish (ab. *rutilipennis*). Length 3-5.5 mm. Geece, Cyprus, Turkey ...  
..... (*cypricola, resslī*) **isikdagensis**



Figs. 1 - 3. *Aphodius (Alocoderus) turbatus* Baudi, 1870 (length 6 mm; Insula Cypro). 1 Habitus; 2 aedeagus (dorsal view); 3 aedeagus (lateral view).

Figs. 4 - 6. *Aphodius (Alocoderus) strigimargo* Reitter, 1892 (length 6 mm; Uzbekistan: Taschkend). 4 Habitus; 5 aedeagus (dorsal view); 6 aedeagus (lateral view).



Figs. 7 - 9. *Aphodius (Liothorax) plagiatus* (Linné, 1767) (length 4 mm; Russia: Siberia, Kharat). 7 Habitus; 8 aedeagus (dorsal view); 9 aedeagus (lateral view).

Figs. 10 - 12. *Aphodius (Liothorax) isikdagensis* Balthasar, 1952 (length 5 mm; Turkey: Vil. Ankara: Çamlıdere, Işık Dağ.). 10 Habitus; 11 aedeagus (dorsal view); 12 aedeagus (lateral view).



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## Authors addresses:

Dellacasa Giovanni, C. P. 921, I-16121 Genova, Italia.

Dellacasa Marco, Università di Pisa. Centro interdipartimentale. Museo di Storia naturale e del Territorio, Via Roma, 79, I-56011 Calci (PI), Italia.

Ziani Stefano – Via S. Giovanni, 41/a, I-47014 Meldola (Fo), Italia

