

SYSTEMATIC REDEFINITION OF TAXA BELONGING TO THE
GENERA *Ahermodontus* BÁGUENA, 1930 AND
Ammoecius MULSANT, 1842, WITH DESCRIPTION OF THE
NEW GENUS *Vladimirellus* (COLEOPTERA: APHODIIDAE)

DELLACASA¹, M., DELLACASA, G.² and BORDAT, P.³

¹Università di Pisa, Centro interdipartimentale, Museo di Storia naturale e del Territorio
Via Roma, 79, I-56011 Calci (Pisa), Italy, E-mail: dellacasa@museo.unipi.it

²C.P. 921, I-16121 Genova, Italy

³21 Rue Jean Jaurès, F-91370 Verrières le Buisson, France, E-mail: bordat@club-internet.fr

Species belonging to the genera *Ahermodontus* BÁGUENA, 1930 and *Ammoecius* MULSANT, 1842 are redescribed and illustrated. *Vladimirellus* gen. n. is erected for *Aphodius* (*Ammoecius*) *socors* BALTHASAR, 1967. Systematic and/or nomenclatorial status are discussed resulting in new combinations and/or new status as follows: *Pseudoxyomus armaticeps* (PÉRINGUEY, 1901), *Australaphodius catulus* (BALTHASAR, 1946), *Pseudagoliinus oreotragi* (ENDRÓDI, 1978), *Pseudagoliinus tonderae* (ENDRÓDI, 1980). The following new synonymies are established: *Ammoecius bidentulus* HAROLD, 1871, syn. n. = *A. lugubris* BOHEMAN, 1857; *Aphodius* (*Ammoecius*) *dentinus* PÉRINGUEY, 1901, syn. n. = *A. lugubris* BOHEMAN, 1857; *Aphodius* (*Ammoecius*) *dukei* ENDRÓDI, 1964, syn. n. = *A. mimus* (PÉRINGUEY, 1901); *Aphodius* (*Ammoecius*) *kochi* PETROVITZ, 1961, syn. n. = *A. mimus* (PÉRINGUEY, 1901); *Aphodius* (*Ammoecius*) *orycis* ENDRÓDI, 1980, syn. n. = *A. terminatus* HAROLD, 1869; *Aphodius* (*Ammoecius*) *orycoides* ENDRÓDI, 1980, syn. n. = *A. terminatus* HAROLD, 1869; *Aphodius* (*Ammoecius*) *persimilis* SCHATZMAYR, 1946, syn. n. = *A. elevatus* (OLIVIER, 1789); *Aphodius* (*Ammoecius*) *tschinghaicus* BALTHASAR, 1971, syn. n. = *Loraphodius kashmirensis* (Sharp, 1878). Neotypes are designated for *Ammoecius elevatus* OLIVIER, 1789 and *A. numidicus* MULSANT, 1851. Lectotypes are designated for *Ammoecius bidentulus* HAROLD, 1871, *A. lugubris* BOHEMAN, 1857, *A. terminatus* HAROLD, 1869 and *A. persimilis* SCHATZMAYR, 1946. With 108 figures.

Key words: Aphodiini, *Ahermodontus*, *Ammoecius*, *Vladimirellus*, new genus, systematics, nomenclature, distribution

INTRODUCTION

In his catalogue, DELLACASA M. (1988) listed 38 and 3 species for *Ammoecius* MULSANT, 1842 and *Ahermodontus* BÁGUENA, 1930, respectively. Since then a number of relevant nomenclatorial and taxonomical changes have been made. We deemed it necessary to thoroughly revise the systematics of the taxa involved, to update taxonomical positions, and to redescribe and illustrate the taxa.

The types of critical taxa were examined. Otherwise, it seemed unnecessary to study types of well-known, easily identifiable species.

The materials examined are preserved in the following institutions or private collections: BCVLB = BORDAT P. collection, Verrière le Buisson, Paris (France); DCG = DELLACASA G. & M. collection, Genova (Italy); HNHMB = Hungarian Natural History Museum, Budapest (Hungary); MCSNM = Museo Civico di Storia Naturale, Milan (Italy); MHNG = Muséum d'Histoire Naturelle, Geneva (Switzerland); MNHNP = Muséum national d'Histoire naturelle, Paris (France); NRS = Naturhistoriska Riksmuseet, Stockholm (Sweden); PCM = PITTINO R. collection, Milan (Italy); SAMCT = South African Museum, Cape Town (South Africa); TMP = Transvaal Museum, Pretoria (South Africa).

SPECIES REMOVED FROM GENUS AMMOECIUS

The following species no longer belong to the genus *Ammoecius*:

Aphodius (Ammoecius) cribripennis PETROVITZ, 1964 from Sneeuw-Berge (South Africa), is a junior synonym of *Harmogaster exarata* HAROLD, 1861 as established by DELLACASA M. (1988: 117). The holotype of *H. exarata* (MHNG) was examined by P. BORDAT, who determined the taxon surely belongs to the genus *Harmogaster*. However, because the specimen is a female, some doubts remain on the specific attribution.

Aphodius (Ammoecius) kovacsi BORDAT, 1990 moved to the genus *Ammoecioides* BORDAT, 1999 (BORDAT 1999: 170).

Aphodius (Ammoecius) mulanje BORDAT, 1985 moved to the genus *Ammoecioides* BORDAT, 1999 (BORDAT 1999: 172).

Aphodius (Ammoecius) pannonicus PETROVITZ, 1961 from Hungary, is a junior synonym of *Loraspis frater* MULSANT et REY, 1870, as already stated by ÁDÁM (1994: 13). The status was confirmed by the study of the type.

Aphodius (Ammoecius) sparsepunctatus PETROVITZ, 1964 moved to the genus *Ammoecioides* BORDAT, 1999 (BORDAT 1999: 176).

Aphodius (Ammoecius) spectabilis PÉRINGUEY, 1901 (nunc *Ammoecioides spectabilis spectabilis*) moved to the genus *Ammoecioides* BORDAT, 1999 (BORDAT 1999: 177).

Aphodius (Ammoecius) tricarinulatus SCHMIDT, 1907 (*nomen novum* for *Aphodius carinulatus* PÉRINGUEY, 1901, nec *Aphodius carinulatus* Motschulsky, 1863, nunc *Ammoecioides spectabilis tricarinulatus*) moved to the genus *Ammoecioides* BORDAT, 1999 (BORDAT 1999: 179).

The following Nearctic species certainly do not belong to the genus *Ammoecius*. They should be placed in different and probably new genera. However, the redefinition of their systematic position is out of the aims of this work:

Aphodius acerbus HORN, 1887 from Texas (probably near San Antonio).
Aphodius aculeatus ROBINSON, 1940 from Utah (Richfield, Sevier County).
Aphodius asellus SCHMIDT, 1907 (*nomen novum* for *Aphodius nanus* HORN, 1887,
nec *Aphodius nanus* FAIRMAIRE, 1860) from Texas (Carrizo Spring).

Based on the study of type material, the following species are herewith removed from the genus *Ammoecius*:

Aphodius (Ammoecius) tshingchaicus BALTHASAR, 1971 from Tschingchai, Kuku-Nor, 3200 m, China. The study of the female holotype (NMP) shows it to be a junior synonym of *Loraphodius kashmirensis* (Sharp, 1878).

Aphodius (Ammoecius) socors BALTHASAR, 1967 from Thomsk (Siberia). Based on the study of the male holotype we ascertained that it belongs to a new genus. Description of *Vladimirellus* gen. n. as well as redescription of *Aphodius socors* with its new systematic position are given in this paper.

Based on the study of type material and according to the generic limits defined by DELLACASA G. *et al.* (2001), P. BORDAT is able to establish the following systematic positions of four Afrotropical taxa previously considered belonging to *Ammoecius*:

Pseudoxyomus armaticeps (PÉRINGUEY, 1901), **comb. n.**

Aphodius (Ammoecius) armaticeps PÉRINGUEY, 1901: 410.

Type locality: "Dunb." [Dunbrody, near Uitenhage, Eastern Cape Province, South Africa.]
Type depository: South African Museum, Cape Town.

Remarks – Authors dealing with this taxon (SCHMIDT 1922: 71, PETROVITZ 1964: 188, ENDRŐDI 1978: 179, ENDRŐDI & RAKOVIČ 1981: 42) have always considered it to belong in *Ammoecius* MULSANT. The type specimen (designated "neotype" by ENDRŐDI, *in litteris*) bears the locality label mentioned above. Thus, it was not from the type locality recorded by PÉRINGUEY in the original description (i. e. "Prince Albert, Cape Province"). A study of this "neotype", at present the sole available specimen, allows us to place *A. armaticeps* into the genus *Pseudoxyomus*.

Australaphodius catulus (BALTHASAR, 1946), **stat. n. et comb. n.**

Aphodius (*Ammoecius*) *catulus* BALTHASAR, 1946: 54; ENDRŐDI & RAKOVIČ 1981: 42 (as a doubtful synonym of *A. brevitarsis* PÉRINGUEY, 1901).

Type locality: "Africa austr., Caffraria". [South Africa.]

Type depository: National Museum, Prague. Type probably lost.

Remarks – The type specimen was not found in BALTHASAR's collection at the Prague Museum. In the key to Afrotropical *Ammoecius* PETROVITZ (1964: 189) placed this taxon among those with the clypeus rounded at sides of median sinuosity and with the epistoma finely punctured, neither rugose nor granulose in front of anterior carina. These are the same distinguishing characters used by BALTHASAR in the original diagnosis. ENDRŐDI (1978) did not deal with this taxon, while ENDRŐDI and RAKOVIČ (1981: 42) proposed a doubtful synonymy of *A. catulus* as *A. brevitarsis* PÉRINGUEY, 1901 (now a junior synonym of *Australaphodius frenchi* BLACKBURN, 1858). BORDAT (1990: 315) accepted this interpretation and, based on characters stressed by the original description, moved *A. catulus* from *Ammoecius* to *Australaphodius*. Without the examination of the type, it is not certain whether *A. catulus* is identical with *A. frenchi* or *Australaphodius accola* (KOLBE, 1908). Thus it is considered, until proved otherwise, to be a valid species.

Pseudagoliinus oreotragi (ENDRŐDI, 1978), **comb. n.**

Aphodius (*Ammoecius*) *oreotragi* ENDRŐDI, 1978: 181.

Type locality: Shneeukop, SW Cap. [South Africa.]

Type depository: Transvaal Museum, Pretoria.

Remarks – This taxon shows most of the distinguishing characters of the genus *Pseudagoliinus* BORDAT, 1994. Being monotypic at the time of its description, the diagnosis of *Pseudagoliinus* was obviously created on the basis of its type species, *Pseudagoliinus sinuatipes* (BORDAT, 1994). However, some generic characters (e.g. elytral interstices apically subcariniform and sharply bordered at each side) do not fit with those of *P. oreotragi*, thus these characters have to be downgraded to species level. The shape of the parameres is particularly significant, because in *P. oreotragi* they have an elongate apical seta, while they are glabrous in *P. sinuatipes* and in *P. tonderae* (ENDRŐDI, 1980). It must be noted that this difference is also found in the sibling species of other genus-group taxa. For example, it is found in *Pseudopharaphodius anthrax* (GERSTAECKER, 1871) and *Pseudophara-*

phodius kaszabi (ENDRŐDI, 1957) and in *Lorditomaeus bifidus* SCHMIDT, 1908 and *Lorditomaeus similis* BORDAT, 1996.

Pseudagoliinus tonderae (ENDRŐDI, 1980), **comb. n.**

Aphodius (*Ammoecius*) *tonderae* ENDRŐDI, 1980: 35.

Type locality: Heidelberg, South Africa.

Type depository: Hungarian Natural History Museum, Budapest.

Remarks – The study of a paratype, preserved in the Pretoria Museum, allows us to move this species from *Ammoecius* to *Pseudagoliinus*. *Pseudagoliinus tonderae* is very similar to *P. oreotragi* from which it is easily distinguishable by the shape of the parameres.

SYSTEMATIC PART

Vladimirellus gen. n.

Type species: *Aphodius socors* BALTHASAR, 1967

Diagnosis: *Species parvae, subovatae, fortiter convexae, glabrae. Nigrae. Capite cupuliformi; epistoma antice transversim modice carinato; clypeo medio leviter sinuato, lateribus denticulato; pronoto basi marginato; scutello parvo, triangulari, lateribus distincte sulcato; elytris humeribus denticulatis; striis latis, fortiter impressis, distincte crenulatis, punctis medio granulo-catenulatis; interstitiis modice convexis, utrinque striolatis. Metatibiis setis apicalibus longitudine aequalibus.*

Description: Length 4.0 mm. Short, oval, strongly convex, glabrous. Blackish. Head cupuliform, epistoma anteriorly with feeble transverse carina, clypeus faintly sinuate at middle, denticulate at sides, thinly bordered laterally, border glabrous; genae widely rounded, faintly protruding more than eyes; frontal suture feebly raised, weakly tuberculate at middle. Pronotum transverse, doubly coarsely punctured, base bordered. Scutellum small, regularly triangular with curved sides and laterally with two distinct oblique impressions. Elytra sharply denticulate at shoulder; striae wide, rather shiny, strongly impressed, distinctly crenulate, punctures granulate at middle and joined each other by a fine carina; interstices feebly convex, strongly microreticulate, sparsely finely and irregularly punctured, at each side with a superficial striola along the stria (Fig. 6). Fore tibiae distally tridentate and proximally faintly serrulate at outer margin; upperside smooth. Middle and hind tibiae with strong transverse carinae on outer face; apically fimbriate with very short and equal spinules. Pygidium glabrous, strongly microreticulate thus dull, superficially confusedly punctured, with trace

of longitudinal groove toward apex. Sexual dimorphism probably shown in males (females unknown) mainly by fore tibiae apical spur stout, cylindrical, abruptly downward curved toward apex. Aedeagus strongly sclerotized with very short paramera apically rounded (Figs 7–8). Epipharynx with anterior margin feebly bisinuate and widely rounded at sides; epitorma drop-shaped; corypha with rather short and stout apical spiculae protruding beyond front margin; pedia pubescent toward corypha only and with several strong chaetae serially arranged obliquely; chaetopariae dense and moderately elongate (Fig. 5).

Distribution: Northeastern Palearctic region (Siberia).

Etymology: Named in honour of Dr. VLADIMIR BALTHASAR, describer of the type species.

Remarks – The genus is readily distinguishable from *Ammoecius* because of the peculiar shape of the elytral striae.

Vladimirellus socors (BALTHASAR, 1967), **comb. n.**
(Figs 1, 5–8)

Aphodius (*Ammoecius*?) *socors* BALTHASAR, 1967: 127.

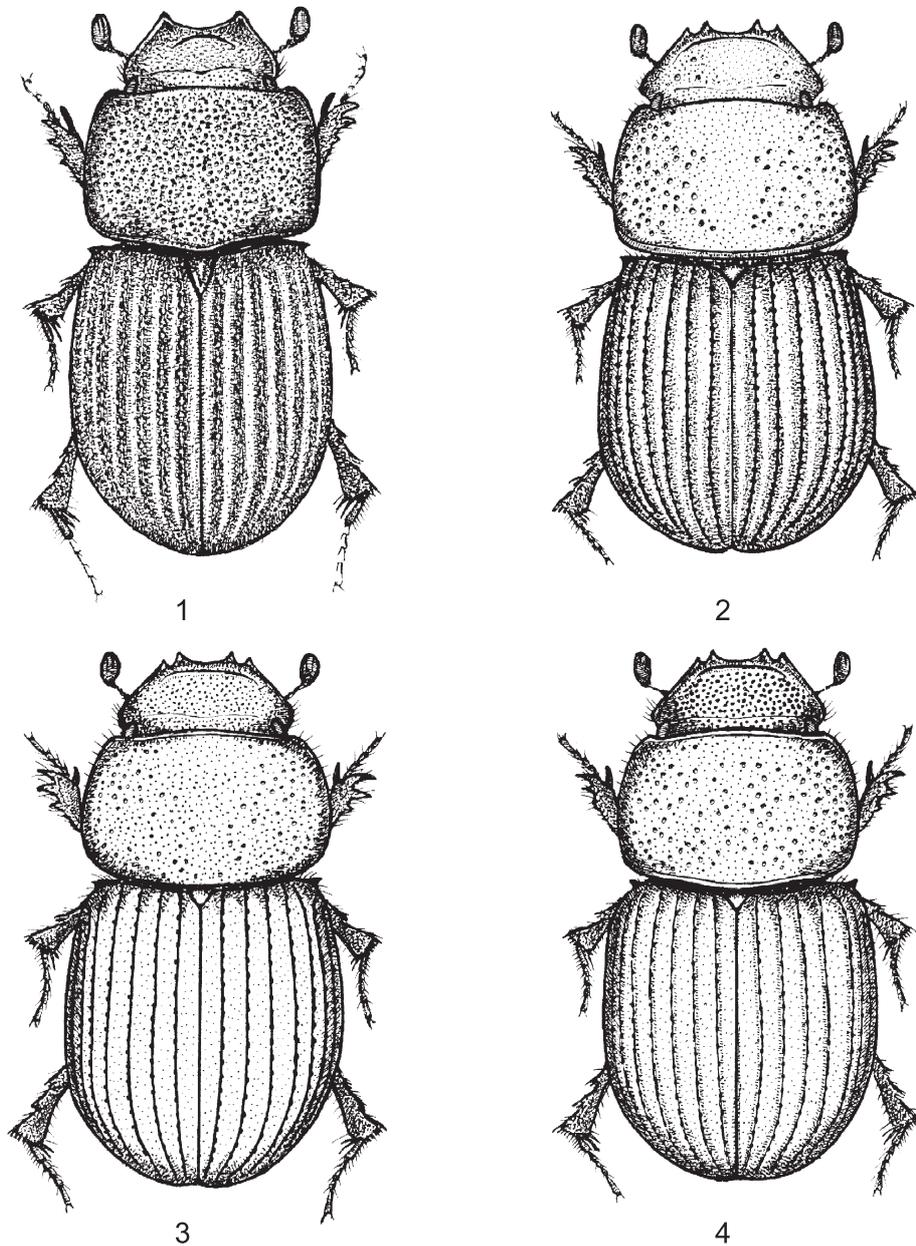
Aphodius (*Ammoecius*) *socors*: DELLACASA M. 1988: 200.

Type locality: “Thomsk, Sibirien”. [Siberia.]

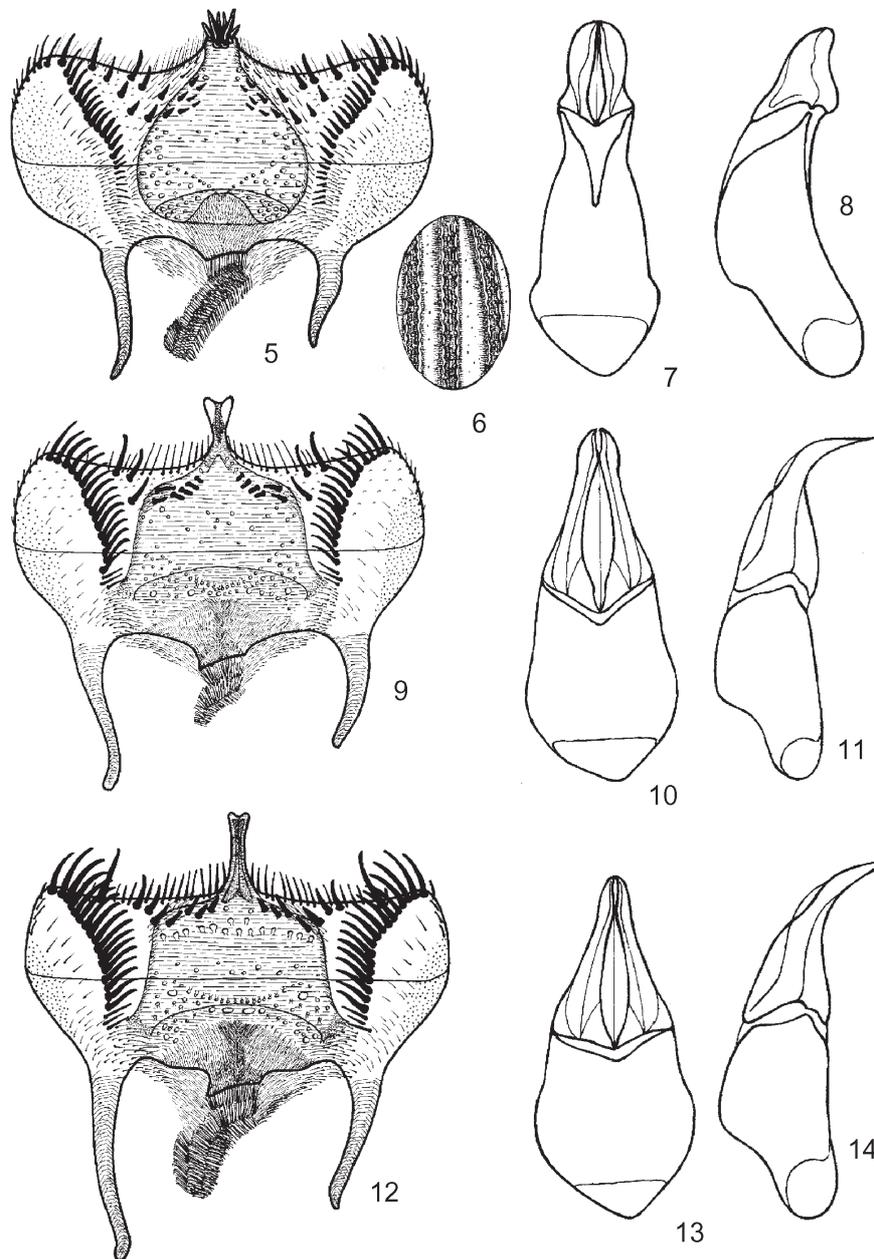
Type depository: BALTHASAR collection, National Museum, Prague.

Type material: Holotype, male, with handwritten locality label: “Thomsk” and printed label “Reitter collection”.

Redescription of male – Length 4.0 mm. Oblong, stout, strongly convex, strongly microreticulate thus strongly dull, glabrous (Fig. 1). Blackish, clypeal margin and legs dark brownish; antennal club piceous. Head cupuliform; epistoma strongly microreticulate and indistinctly punctured, anteriorly with a feebly raised transverse short carina; clypeus very feebly sinuate at middle, denticulate at sides, denticles distinctly upturned; genae widely rounded, shortly and sparsely ciliate, faintly protruding more than eyes; frontal suture somewhat more shiny, slightly raised laterally and with a weak median tubercle; frons relatively more superficially microreticulate, regularly and densely punctured; epipharynx: Fig. 5. Pronotum feebly transverse, strongly microreticulate, doubly punctured; larger punctures densely and regularly scattered throughout, mixed much smaller ones; sides thinly bordered, parallel toward base; hind angles obtusely rounded; base faintly bisinuate, thickly bordered. Scutellum with a median carina feebly raised, lateral impressions confusedly irregularly punctured. Elytra shortly oval, sharply denticulate at shoulder; striae wide, rather shiny, strongly impressed, distinctly crenulate, punctures with a small central granule joining each other by a fine carina; interstices feebly convex, strongly microreticulate, sparsely, finely and confusedly punctured, at each side with a superficial striola along the stria (Fig. 6). Fore tibiae with apical spur stout, cylindrical, longer than first two tarsal segments combined, abruptly downward curved toward apex; middle tibiae with inferior apical spur short, obliquely truncate apically. Superior apical spur of hind tibiae nearly as long as inferior one and distinctly shorter than first tarsal segment (other segments lacking in the sole specimen available). Metasternal plate nearly flat, strongly microreticulate, irregularly punctured and with median longitudinal groove shiny and slightly impressed. Aedeagus: Figs 7–8.



Figs 1–4. Habitus of: 1 = *Vladimirellus socors* (BALTHASAR, 1967) (male, length 4.0 mm; Russia: Siberia Thomsk), 2 = *Ahermodontus bishoffi* (VŠETEČKA, 1939) (female, length 4.5 mm; Albania: Logara), 3 = *A. marini* BÁGUENA, 1930 (male, length 4.0 mm; Spain: Castellón, Onda), 4 = *A. ambrosi* PARDO ALCAIDE, 1936 (male, length 4.0 mm; Morocco: Taxdirt, B. Sicar.)



Figs 5–14. *Vladimirellus socors* (BALTHASAR, 1967): 5 = epipharynx, 6 = elytral sculpture, 7–8 = aedeagus (dorsal and lateral view). *Ahermodontus ambrosi* PARDO ALCAIDE, 1936: 9 = epipharynx, 10–11 = aedeagus (dorsal and lateral view). *A. marini* BÁGUENA, 1930: 12 = epipharynx, 13–14 = aedeagus (dorsal and lateral view)

Female unknown.

Distribution: Known only from the holotype from the type locality.

Ahermodontus BÁGUENA, 1930

Ahermodontus BÁGUENA, 1930: 315; BÁGUENA 1959: 214 (as synonym of *Ammoecius*); BALTHASAR 1964: 475; DELLACASA G. & DELLACASA M. 1998: 414; DELLACASA G. *et al.* 2001: 77. *Aphodius* (*Ahermodontus*): BÁGUENA 1967: 122; DELLACASA M. 1988: 221.

Type species: *Ahermodontus marini* BÁGUENA, 1930 (monotypy).

Description – Length 4.0–4.5 mm. Apterous species, rather small, stout, strongly convex, more or less shiny, glabrous. Black, clypeal margin and legs brownish-red; antennal club testaceous. Head wide, cupuliform; epistoma finely or coarsely punctured, anteriorly with strong transverse carina; clypeus faintly sinuate at middle, bidenticulate at each side, inner teeth stronger than outer ones, all teeth more or less strongly upturned, laterally straight and more or less thinly bordered, border glabrous and more or less distinctly upturned; frontal suture nearly faint or distinctly impressed only laterally, not at all tuberculate; genae obtusely rounded, rather ciliate, protruding more than eyes; latter small. Pronotum widely transverse, strongly convex, doubly punctured; larger punctures sparser on disc; finely bordered at front or not; lateral margins thinly bordered, shortly ciliate toward front angles; hind angles obtusely rounded; base bordered or not. Scutellum very small, regularly triangular, feebly convex, unpunctured. Elytra convex, very shiny, oval-elongate; striae deep, strongly punctured, feebly or strongly crenulate; interstices flat or convex, sometimes apically subcarinate, sparsely finely punctured; shoulder strongly denticulate. Fore tibiae distally tridentate and proximally distinctly 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. Pygidium with rather dense and moderately elongate pubescence, mixed toward apical margin some very elongate and straight setae. Sexual dimorphism shown in males by punctuation of pronotum being more sparse on disc, by inferior apical spur of mesotibiae strongly shortened and apically subtruncate. Aedeagus with elongate parameres, curved and acuminate apically. Epipharynx widely transverse, feebly bisinuate at front margin; corypha strongly protruding frontwards, apically rounded and sinuate at middle; epitorma campaniform; chaetopariae with rather elongate and densely arranged chaetae; chaetopodia with few strong spines arranged in nearly regular series.

Distribution: SW Palaearctic region (Albania, southern Spain and Spanish Morocco).

KEY TO SPECIES OF AHERMODONTUS BÁGUENA, 1930

- | | | |
|---|---|-----------------------------|
| 1 | Base of pronotum not bordered; epistoma finely punctured; elytral interstices flat. Black. Length 4.0 mm. Southern Spain (Castellón and Valencia provinces) | <i>marini</i> BÁGUENA, 1930 |
| – | Base of pronotum distinctly bordered | 2 |

- 2 Anterior margin of pronotum with thin but distinct border; elytral interstices feebly convex; epistoma coarsely punctured. Black. Length 4.0 mm. Southern Spain (Andalusia), Morocco (Melilla)
ambrosi PARDO ALCAIDE, 1936
- Anterior margin of pronotum not bordered; elytral interstices feebly convex on disc, distinctly convex laterally, subcarinate apically; epistoma finely punctured. Black. Length 4.5 mm. Albania (Logara)
bischoffi (VŠETEČKA, 1939)

Ahermodontus ambrosi PARDO ALCAIDE, 1936
(Figs 4, 9–11)

Ahermodontus ambrosi PARDO ALCAIDE, 1936: 392; BALTHASAR 1964: 476; DELLACASA G. & DELLACASA M. 1998: 415.

Aphodius ambrosi: KOCHER 1958: 17.

Aphodius (Ammoecius) ambrosi: BARAUD 1971: 69.

Aphodius (Ahermodontus) ambrosi: DELLACASA M. 1988: 159; VEIGA 1998: 146.

Type locality: Sidi-Messaud (Beni-Bu-Gafar), Morocco.

Type depository: Institut Scientifique Cherifien, Rabat.

Description – Length 4.0 mm. Stout, strongly convex, shiny, glabrous (Fig. 4). Blackish, clypeal margin and legs brown-reddish, antennal club testaceous. Head large; epistoma faintly gibbous at middle, coarsely, regularly punctured throughout, punctation somewhat confluent laterally, with anterior transverse carina moderately raised in front of which punctation slightly finer and sparser; clypeus feebly sinuate at middle, bidentate at each side, laterally straight and thinly bordered, border feebly upturned; genae obtusely rounded, ciliate, protruding more than eyes; frontal suture very finely impressed, shiny; frons with punctation somewhat finer than epistoma; epipharynx: Fig. 9. Pronotum transverse, strongly convex, doubly punctured; larger punctures rather sparse on disc, denser on sides, mixed with regularly scattered, smaller punctures throughout; anterior margin finely bordered; lateral margins subparallel, rather thinly bordered, border with short and sparse setae toward anterior angles; hind angles obtusely rounded; base not bisinuate, thickly bordered. Scutellum faintly convex, finely and sparsely punctured on basal half. Elytra shortly oval, strongly convex, sharply denticulate at shoulder; striae deep, superficially punctured, faintly crenulate; interstices slightly convex, very finely and sparsely punctured. Hind tibiae superior apical spur longer than first tarsal segment; latter somewhat longer than following two combined. Male: pronotum relatively less densely punctured on disc; inferior apical spur of middle tibiae distinctly shortened and obliquely truncate apically; aedeagus: Figs 10–11. Female: pronotum relatively more densely punctured on disc; inferior apical spur of middle tibiae regularly acuminate toward apex.

Distribution: Southern Spain (Andalusia: Malaga), Morocco (Melilla).

Ahermodontus bischoffi (VŠETEČKA, 1939)
(Figs 2, 15)

Aphodius (*Ammoecius*) *bischoffi* VŠETEČKA, 1939: 31; BALTHASAR 1964: 79; BARAUD 1971: 69.

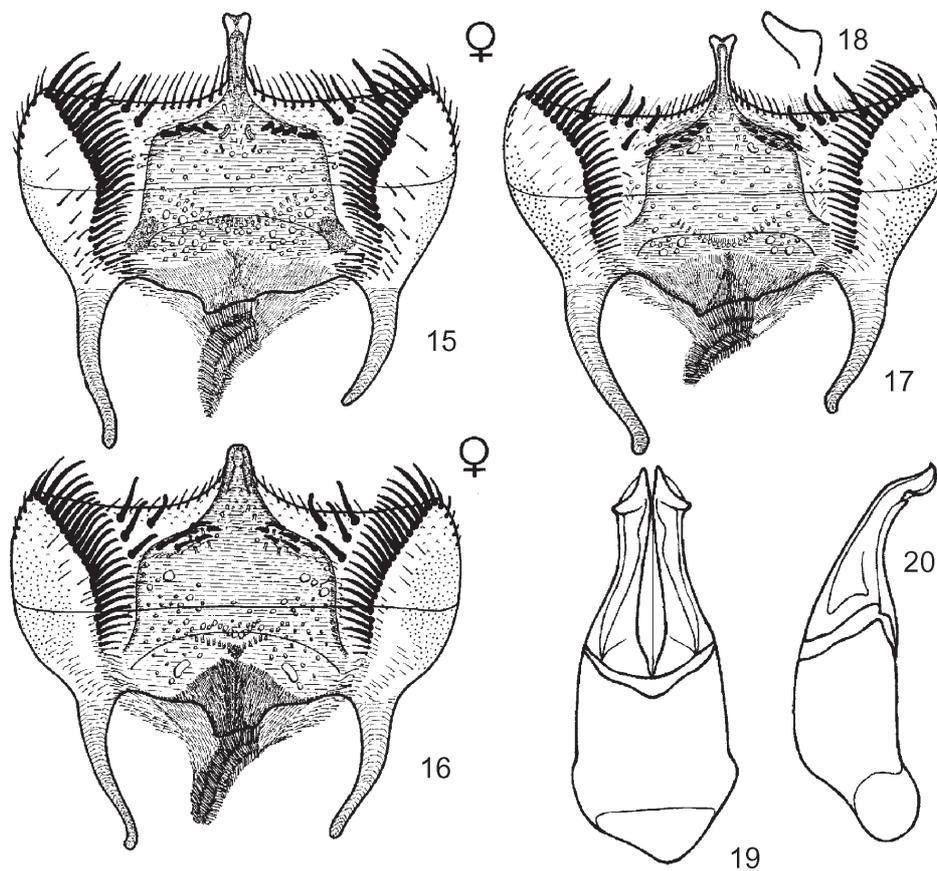
Aphodius (*Ahermodontus*) *bischoffi*: DELLACASA M. 1988: 99.

Ahermodontus bischoffi: DELLACASA G. & DELLACASA M. 1998: 415.

Type locality: Logara, Albania.

Type depository: BALTHASAR collection, National Museum, Prague.

Type material: We had the opportunity to examine the female holotype, which is, as far as we know, the sole specimen known. It was collected in 1934 by Alfons Bischoff (Tirana) to whom the species was dedicated.



Figs 15–20. 15 = epipharynx of *Ahermodontus bischoffi* (VŠETEČKA, 1939), 16 = epipharynx of *Ammoecius eli* (PETROVITZ, 1961). *A. dogueti* (BARAUD, 1980): 17 = epipharynx, 18 = apex of corypha (lateral view), 19–20 = aedeagus (dorsal and lateral view)

Description of female – Length 4.5 mm. Short, oval, strongly convex, shiny, glabrous (Fig. 2). Blackish; clypeal margin and legs brown-reddish; antennal club reddish-testaceous. Head with epistoma finely microreticulate and almost imperceptibly punctured on disc, laterally with few punctures very large, anteriorly with strong transverse carina in front of which the punctation becomes finely granulose; clypeus quadridentate, inner teeth stronger and more upturned than lateral ones, subtruncate at middle, straight and thinly bordered at sides; genae angulate, rather elongately ciliate, distinctly protruding more than eyes; frontal suture faint; frons somewhat more distinctly punctured than epistomal disc; epipharynx: Fig. 15. Pronotum transverse, strongly convex, doubly punctured, larger punctures irregularly sparse, much denser on sides; much smaller punctures throughout regularly scattered; sides nearly straight, thinly bordered, border shortly and sparsely bristled toward front angles; hind angles obtusely rounded; base not bisinuate at all, very thickly bordered, border distinctly sunken if compared with pronotal surface. Scutellum regularly triangular, slightly convex, impunctate. Elytra strongly convex, feebly broadened backward; sharply denticulate at shoulder; striae large, very deep, coarsely punctured, strongly crenulate; interstices moderately convex on disc, more distinctly convex laterally and subcarinate on preapical declivity, laterally microreticulate, finely sparsely punctured. Hind tibiae superior apical spur as long as first tarsal segment; latter as long as following three combined.

Male unknown.

Distribution: Known only from the type locality.

Ahermodontus marini BÁGUENA, 1930
(Figs 3, 12–14)

Ahermodontus marini BÁGUENA, 1930: 315; BALTHASAR 1964: 476; DELLACASA G. & DELLACASA M. 1998: 415; DELLACASA G. *et al.* 2001: 77.

Ammoecius (Ahermodontus) marini: BÁGUENA 1960: 29.

Aphodius (Ammoecius) marini: BÁGUENA 1959: 214; BARAUD 1971: 64; BARAUD 1992: 146.

Aphodius (Ahermodontus) marini: BÁGUENA 1967: 122; DELLACASA M. 1988: 159.

Type locality: Fuente de Barraix, De Estivella (Valencia), Spain.

Type depository: BÁGUENA collection, Museo de la Universidad de Valencia, Valencia.

Description – Length about 4.0 mm. Stout, strongly convex, shiny, glabrous (Fig. 3). Black, clypeal margin and legs reddish; antennal club testaceous. Head strongly convex, epistoma anteriorly with strong transverse carina, quite finely and regularly punctured, punctation somewhat sparser at center and subrugose laterally; clypeus faintly sinuate at middle, bidenticulate at each side, laterally straight, rather thinly bordered, border feebly upturned; genae obtusely rounded, ciliate, protruding more than eyes; frontal suture very finely impressed, not at all tuberculate; frons regularly punctured; epipharynx: Fig. 12. Pronotum transverse, doubly punctured; larger punctures nearly lacking on disc; finely bordered at front and at lateral margins; latter regularly rounded; base not bordered. Scutellum feebly convex, smooth. Elytra oval-elongate; strongly denticulate at shoulder; deeply striate; striae distinctly punctured, feebly crenulate; interstices nearly flat, very sparsely finely punctured; epipleura strong, distinct to sutural angles. Hind tibiae superior apical spur slightly longer than first tarsal segment; latter longer than following two combined. Male: pronotum relatively less densely punctured on disc; inferior apical spur of middle tibiae strongly shortened and apically subtruncate;

aedeagus: Figs 13–14. Female: pronotum relatively more densely punctured on disc; inferior apical spur of middle tibiae elongate and regularly acuminate apically.

Distribution: Southern Spain (Castellón and Valencia provinces).

Ammoecius MULSANT, 1842

Ammoecius MULSANT, 1842: 302; PAULIAN 1942: 25; ADÁM 1994: 13; DELLACASA G. *et al.* 2001: 82.

Aphodius (*Ammoecius*): REITTER 1892: 183; PAULIAN & BARAUD 1982: 111; DELLACASA G. 1983: 164; DELLACASA M. 1988: 368 (catalogue).

Aphodius (secção *Digonorhinus*): SEABRA 1909: 12; DELLACASA G. *et al.* 2001: 82 (as synonym of *Ammoecius*).

Aphodius (Artengruppe *Ammoecius*): ENDRÓDI 1964: 105.

Aphodius (group *Ammoecius*): ENDRÓDI & RAKOVIĆ 1981: 42.

Type species: *Scarabaeus elevatus* OLIVIER, 1789 (monotypy).

Description – Length 3.0–10.0 mm. Small or medium size species, stout or suboval, strongly convex, shiny, glabrous. Black, sometimes elytra reddish, seldom quite reddish. Head cupuliform; epistoma punctured, rarely subrugose anteriorly, always with distinct transverse carina; clypeus usually sinuate at middle, either denticulate or angulate at sides, bordered, border glabrous; genae obtusely rounded, ciliate, protruding more than eyes; latter small; frons without any trace of tubercles. Pronotum strongly convex, sparsely or densely punctured; bordered at sides and usually at base, seldom at front margin. Scutellum small, triangular, punctured. Elytra strongly convex, widened posteriorly, rarely parallel-sided; striae deep or superficial; interstices flat, feebly convex, sometimes distinctly convex apically. Fore tibiae distally tridentate and proximally serrulate at outer margin, upper side with few large superficial punctures irregularly scattered. Middle and hind tibiae with strong transverse carinae on outer face, fimbriate with apical spinules short and equal. Pygidium with fine, rather sparse, short and straight pubescence; its apical margin with dense and moderately elongate cilia. Sexual dimorphism shown in males by more evident epistomal carina and less dense punctation on pronotal disc; by inferior apical spur of middle tibiae shortened and abruptly inwardly bent apically (except in *A. incultus*); by the peculiar shape of fore tibial apical spur (in several taxa); by metasternal plate more deeply excavate. Aedeagus with paramera elongate, apically widened, sinuate or abruptly narrowed; sometimes with membranous processes preapically inserted. Epipharynx distinctly sinuate at front margin; corypha strongly protruding beyond front margin and distinctly sinuate apically; epitorma wide, guttiform; pedia with sparse, stout elongate chaetae, anterior ones hooked; chaetopariae dense and very elongate.

Distribution: Palaearctic and Afrotropical regions.

KEY TO SPECIES OF AMMOECIUS MULSANT, 1842

1	Palaearctic taxa	2
–	Southern Afrotropical taxa	17

- 2 Clypeus distinctly denticulate or, at least, acutely angulate at sides of median sinuosity 3
- Clypeus nearly rounded or, at most, obtusely angulate at sides of median sinuosity 12
- 3 Elytral interstices subcarinate on preapical declivity, striae deep, as wide as interstices and with large transverse punctures. Length 5.0 mm. Iraq
eli (PETROVITZ, 1961)
- Elytral interstices convex or flat but not subcarinate toward apex 4
- 4 Anterior margin of pronotum not bordered 5
- Anterior margin of pronotum finely bordered 9
- 5 Shoulder distinctly denticulate 6
- Shoulder not denticulate, at most epipleural carina more or less distinctly angulate at shoulder 7
- 6 Elytral interstices flat. Length 6.0–6.5 mm. Algeria
dogueti (BARAUD, 1980)
- Elytral interstices strongly convex. Length 5.5 mm. Syria
naviauxi (BARAUD, 1971)
- 7 Fore tibiae with apical spur regularly acuminate toward apex in both sexes; first segment of hind tarsi as long as following three combined. Length 5.0–8.0 mm. Southwestern Europe (from Portugal to northwestern coastal Italy), Northwestern Africa (from Morocco to Libya)
elevatus (OLIVIER, 1789)
- Fore tibiae with apical spur, in males, digitiform; first segment of hind tarsi somewhat longer than following three combined 8
- 8 Elytral striae not or faintly crenulate; interstices flat on disc; fore tibiae with apical spur, in males, cylindrical and inwardly faintly hooked at apex. Length 6.0–6.5 mm. Asian Turkey, Greece? *muchi* (PETROVITZ, 1962)
- Elytral striae strongly crenulate; interstices slightly convex on disc; fore tibiae with apical spur, in males, spatulate and slightly broadened apically. Length 6.5–7.5 mm. Southern Turkey *satanas* (CARPANETO, 1976)
- 9 Pronotal punctation simple, rather fine and regularly scattered. Length 4.0–5.0 mm. Algeria
felscheanus REITTER, 1904

- Pronotal punctation double, large punctures irregularly scattered 10
- 10 Epistoma, in front of transverse anterior carina, simply and rather sparsely punctured. Length 4.0–5.0 mm. Southern Portugal and Spain, western Morocco *dentatus* SCHMIDT, 1908
- Epistoma, in front of transverse anterior carina, more or less strongly granulo-rugose 11
- 11 Larger pronotal punctures irregular and sparse on basal two-thirds of disc; genae not auriculate at all; elytral striae feebly crenulate. Length 4.5–5.0 mm. Algeria, Tunisia, Sicily? *numidicus* MULSANT, 1851
- Larger pronotal punctures irregular and sparse only on basal third of disc; genae auriculate; elytral striae faintly crenulate. Length 5.0–6.0 mm. Morocco *franzi* (PETROVITZ, 1964)
- 12 Anterior margin of pronotum not bordered or with border widely interrupted at middle 13
- Anterior margin of pronotum finely bordered 16
- 13 Elytral interstices flat 14
- Elytral interstices more or less strongly convex 15
- 14 Pronotum extremely transverse, broadened; base of pronotum bordered only up to level of fifth elytral interstice; hind tibiae with superior apical spur feebly longer than first two tarsal segments combined. Length 4.5–5.0 mm. Morocco (Haut Atlas) *ampliocollis* (PEYERIMHOFF, 1939)
- Pronotum moderately transverse; basal margin of pronotum bordered; fore tibiae with apical spur digitiform, apically broadly spatulate. Length 5.5–6.5 mm. Azerbaijan, Iran *meurguesae* CLÉMENT, 1975
- 15 Elytral interstices strongly convex; striae large, very deep, coarsely punctured, strongly crenulate. Length 3.5–4.5 mm. Europe, Asia (Turkmenistan, Mongolia, Siberia) *brevis* ERICHSON, 1848
- Elytral interstices moderately convex; striae rather fine, almost superficially punctured, feebly crenulate. Length 4.5–5.5 mm. Portugal, Spain, Morocco? *frigidus* BRISOUT, 1866
- 16 Epistoma finely and sparsely punctured on disc. Length 4.5–5.0 mm. Portugal, Spain, Morocco?, Algeria? *lusitanicus* ERICHSON, 1848

- Epistoma coarsely, densely, subrugosely punctured on disc. Length 4.0–5.0 mm. Western Sardinia, Sicily?, Tunisia, Algeria
rugifrons AUBÉ, 1850
- 17 Clypeal margin rounded at sides of median sinuosity. Length 4.0–5.0 mm. South Africa (Northern and Western Cape Province)
mimus (PÉRINGUEY, 1901)
- Clypeal margin acutely angulate or denticulate at sides of median sinuosity 18
- 18 Pronotal punctation double. Length 3.5–5.0 mm. South Africa (Cape Province, Transvaal?)
lugubris BOHEMAN, 1857
- Pronotal punctation simple 19
- 19 Epistomal and pronotal punctation fine and sparse; middle tibiae with inferior apical spur apically acuminate in both sexes. Length 3.0–3.5 mm. South Africa (Western Cape Province) *incultus* (PETROVITZ, 1961)
- Epistomal and pronotal punctation rather coarse and dense; middle tibiae with inferior apical spur, in males, short and abruptly inwardly bent at apex. Length 3.5–5.5 mm. South Africa (Northern and Western Cape Province, Namaqualand) *terminatus* HAROLD, 1869

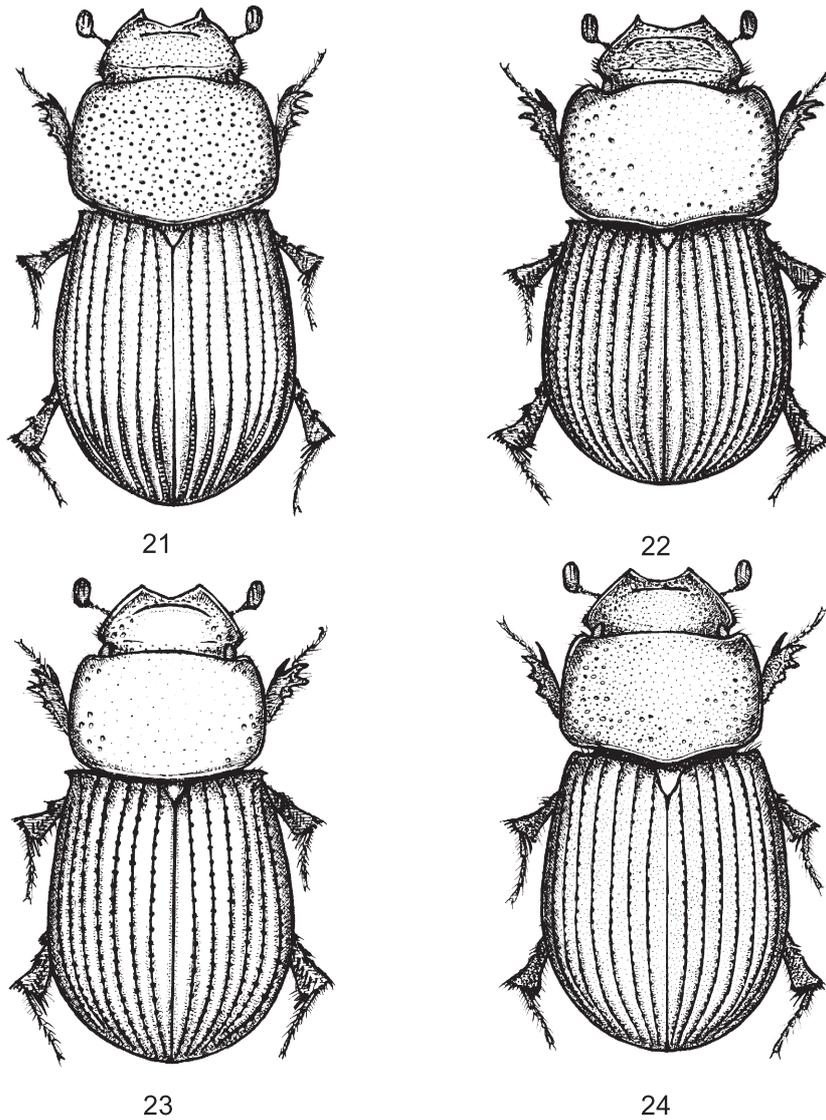
Ammoecius amplicollis (PEYERIMHOFF, 1939), **comb. n.**
(Figs 67, 69–72)

Aphodius (*Ammoecius*) *amplicollis* PEYERIMHOFF, 1939: 279; BALTHASAR 1964: 81; PETROVITZ 1968: 230; BARAUD 1971: 65; BARAUD 1985: 109; DELLACASA M. 1988: 86.

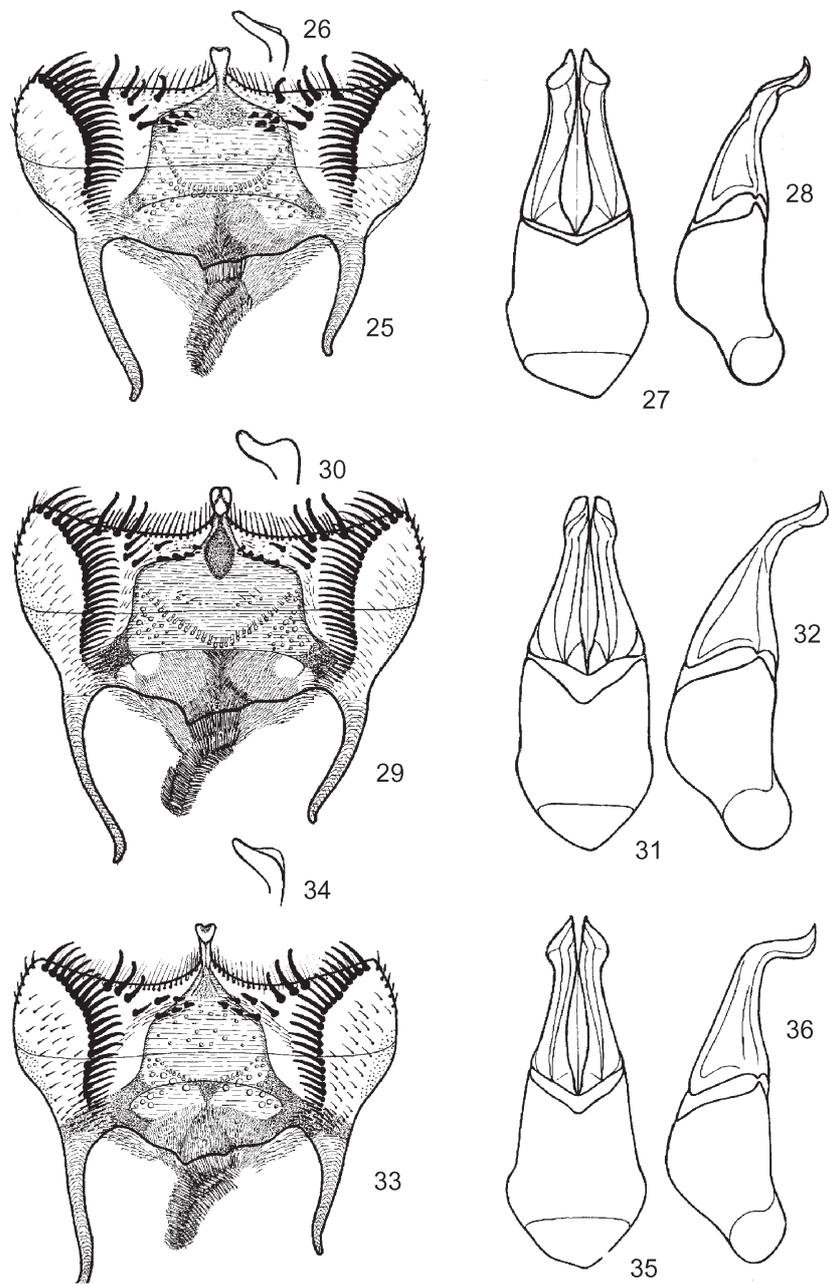
Type locality: “Massif du Toubkal, Grand-Atlas”. [Morocco.]
Type depository: Muséum national d’Histoire naturelle, Paris.

Description – Length 4.5–5.5 mm. Short, oblong, convex, strongly shiny, glabrous (Fig. 67). Black, clypeal margin and legs brown-reddish, antennal club piceous. Head with cupuliform epistoma almost imperceptibly punctured on disc; punctation distinct, very fine and regular laterally and in front of the rather short and feebly curved transverse carina; clypeus angulately sinuate at middle, obtusely angulate at sides, finely bordered, border feebly upturned; genae obtuse, elongately ciliate, distinctly protruding more than eyes; frontal suture finely impressed; frons very finely and sparsely punctured; epipharynx: Fig. 69; apex of corypha: Fig. 70. Pronotum strongly convex, widely transverse, strongly broader than long, smooth on disc, with extremely fine punctation on sides and therein with few very sparse large punctures; anterior margin with lateral vestiges of border; nearly parallel-sided; sides rather thickly bordered and faintly inwardly sinuate before hind angles; latter widely rounded; base not bisinuate, laterally with thin border only to level of fifth elytral interstice.

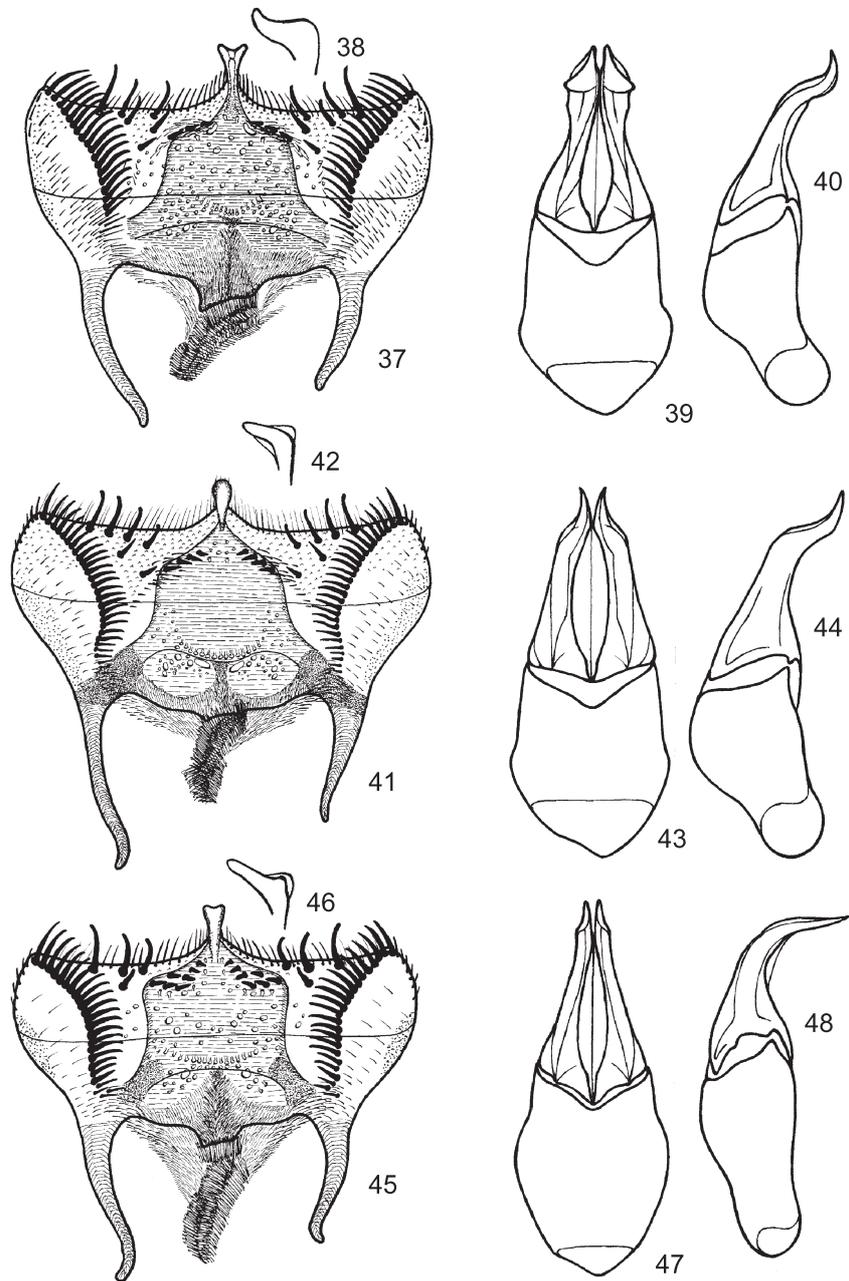
Scutellum very small, regularly triangular, apically rounded, somewhat sunken, smooth. Elytra strongly convex, short, oval, distinctly denticulate at shoulder, rather finely striate; striae superficially punctured, faintly crenulate; interstices nearly flat, imperceptibly punctured. Hind tibiae with



Figs 21–24. Habitus of: 21 = *Ammoecius eli* (PETROVITZ, 1961) (female, length 5 mm, Iraq: Mesopotam., Hilleh), 22 = *A. naviauxi* (BARAUD, 1971) (male, length 5.5 mm, Syria: Slennfé), 23 = *A. dogueti* (BARAUD, 1980) (male, length 6.0 mm, Algeria: Djurdjura, Chemin lac Goulmine), 24 = *A. elevatus* (OLIVIER, 1789) (male, length 7.0 mm, France: Var, S.te-Baume)



Figs 25–36. Epipharynx (25, 29, 33), apex of corypha (lateral view) (26, 30, 34) and aedeagus (dorsal and lateral view) (27–28, 31–32, 35–36) of: 25–28 = *Ammoecius elevatus* (OLIVIER, 1789), 29–32 = *A. satanas* (CARPANETO, 1976), 33–36 = *A. meurguesae* CLÉMENT, 1975



Figs 37–48. Epipharynx (37, 41, 45), apex of corypha (lateral view) (38, 42, 46) and aedeagus (dorsal and lateral view) (39–40, 43–44, 47–48) of: 37–40 = *Ammoecius naviauxi* (BARAUD, 1971), 41–44 = *A. muchei* (PETROVITZ, 1962), 45–48 = *A. brevis* ERICHSON, 1848

superior apical spur feebly longer than first two tarsal segments; first segment of hind tarsi as long as following three combined. Male: pronotum relatively somewhat less convex; inferior apical spur of middle tibiae very short and phylliform; metasternal plate deeply excavate; aedeagus: Figs 71–72. Female: pronotum relatively more convex; inferior apical spur of middle tibiae elongate and regularly acuminate apically; metasternal plate convex.

Distribution: An endemic species known from Morocco (Haut Atlas) only. Apart from the type locality, it is also known from Arround and Oukaïmeden (2600 m a. s. l.) where we had the chance to collect several specimens in old goat dung in the middle of June.

Ammoecius brevis ERICHSON, 1848
(Figs 45–48, 81)

Ammoecius brevis ERICHSON, 1848: 907; HAROLD 1871: 11.

Aphodius (Ammoecius) brevis: REITTER 1892: 184; d'ORBIGNY 1896: 207; SCHMIDT 1913: 125; SCHMIDT 1922: 68; BALTHASAR 1964: 79; BARAUD 1971: 68; DELLACASA M. 1988: 68.

Type locality: "Im mittleren und südlichen Deutschland". [Germany.]

Type depository: Museum für Naturkunde der Humboldt Universität, Berlin.

Description – Length 3.5–4.5 mm. Short, oval, strongly convex, shiny, glabrous (Fig. 81). Black, clypeal margin faintly brown-reddish; legs piceous with brown-reddish tarsi; antennal club testaceous. Head with cupuliform epistoma finely irregularly microreticulate, thus sericeous, and imperceptibly punctured on disc; punctation laterally somewhat more distinct, irregularly granulose in front of feebly curved anterior transverse carina; clypeus angulately sinuate at middle, obtusely angulate at sides, distinctly bordered, border feebly upturned; genae obtuse, shortly ciliate, protruding more than eyes; frontal suture finely impressed; frons distinctly, finely, and sparsely punctured; epipharynx: Fig. 45; apex of corypha: Fig. 46. Pronotum transverse, somewhat narrower anteriorly, strongly convex, doubly punctured; large punctures deep, irregularly sparse, absent anteriorly on disc, denser on sides, mixed with much smaller, regularly scattered punctures; sides feebly rounded, thinly bordered, faintly inwardly sinuate before the obtusely rounded hind angles; base distinctly bisinuate, bordered. Scutellum regularly triangular, finely punctured at base. Elytra short, strongly convex, backwardly broadened and with epipleural carina subdenticulate at shoulder, deeply striate; striae with large and coarse punctures, strongly crenulate; interstices convex, almost imperceptibly punctured. Hind tibiae with superior apical spur longer than first tarsal segment; latter as long as following three combined. Male: pronotum relatively more transverse, less convex and with large punctures more sparse; middle tibiae with inferior apical spur very short and obliquely truncate apically; metasternal plate feebly concave; aedeagus: Figs 47–48. Female: pronotum relatively less transverse, more convex and with large punctures more densely arranged; middle tibiae with inferior apical spur more elongate and regularly acuminate apically; metasternal plate flat.

Distribution: Widely distributed in Europe (northwards up to Sweden, in south from Spain to Georgia, but absent in southern Italy, Corsica, Sardinia, Sicily, Greece and European Turkey). In Asia, recorded from Turkmenistan, Mongolia and Siberia (Irkutsk region), but absent in Asia Minor.

Ammoecius dentatus SCHMIDT, 1908
(Figs 52, 77–80)

Ammoecius dentatus SCHMIDT, 1908: 504.

Aphodius (Ammoecius) dentatus: SCHMIDT 1913: 126; SCHMIDT 1922: 70; BALTHASAR 1964: 78; BARAUD 1971: 68; DELLACASA M. 1988: 119.

Type locality: "Tanger, Marokko". [Morocco.]

Type depository: Naturhistoriska Riksmuseet, Stockholm.

Description – Length 4.0–5.0 mm. Short, oval, strongly convex, moderately shiny, glabrous (Fig 52). Black, clypeal margin widely brown-reddish; legs brown-reddish with tarsi paler; antennal club testaceous. Head with cupuliform epistoma distinctly, finely, subregularly punctured on disc; laterally mixed with few large punctures; punctation fine and regular in front of short but strongly raised anterior transverse carina; clypeus widely sinuate at middle, sharply denticulate at sides, very thinly bordered, border feebly upturned; genae angulose, elongately ciliate, protruding more than eyes; frontal suture finely impressed; frons finely and subregularly punctured; epipharynx: Fig. 77; apex of corypha: Fig. 78. Pronotum moderately transverse, strongly convex, doubly punctured; large punctures sparser on disc and absent on anterior quarter, mixed with fine punctures regularly scattered throughout; anterior margin finely bordered; sides feebly rounded, distinctly bordered; hind angles obtusely rounded; base not bisinuate, rather thickly bordered. Scutellum regularly triangular, irregularly punctured on basal half. Elytra strongly convex, feebly broadened backward; striae almost fine, superficially punctured, feebly crenulate; interstices very slightly convex with extremely fine sparse punctures. Hind tibiae with superior apical spur longer than first tarsal segment; latter shorter than following three combined. Male: pronotum with large punctures relatively less densely arranged; inferior apical spur of middle tibiae very short, obtusely rounded apically; metasternal plate distinctly concave; aedeagus: Figs 79–80. Female: pronotum with large punctures relatively more densely arranged; inferior apical spur of hind tibiae elongate and regularly acuminate apically; metasternal plate flat.

Distribution: Portugal (Algarve), Spain (Andalusia), Morocco (Atlantic coast).

Remarks – Coastal sands seem to be the exclusive habitat of this species.

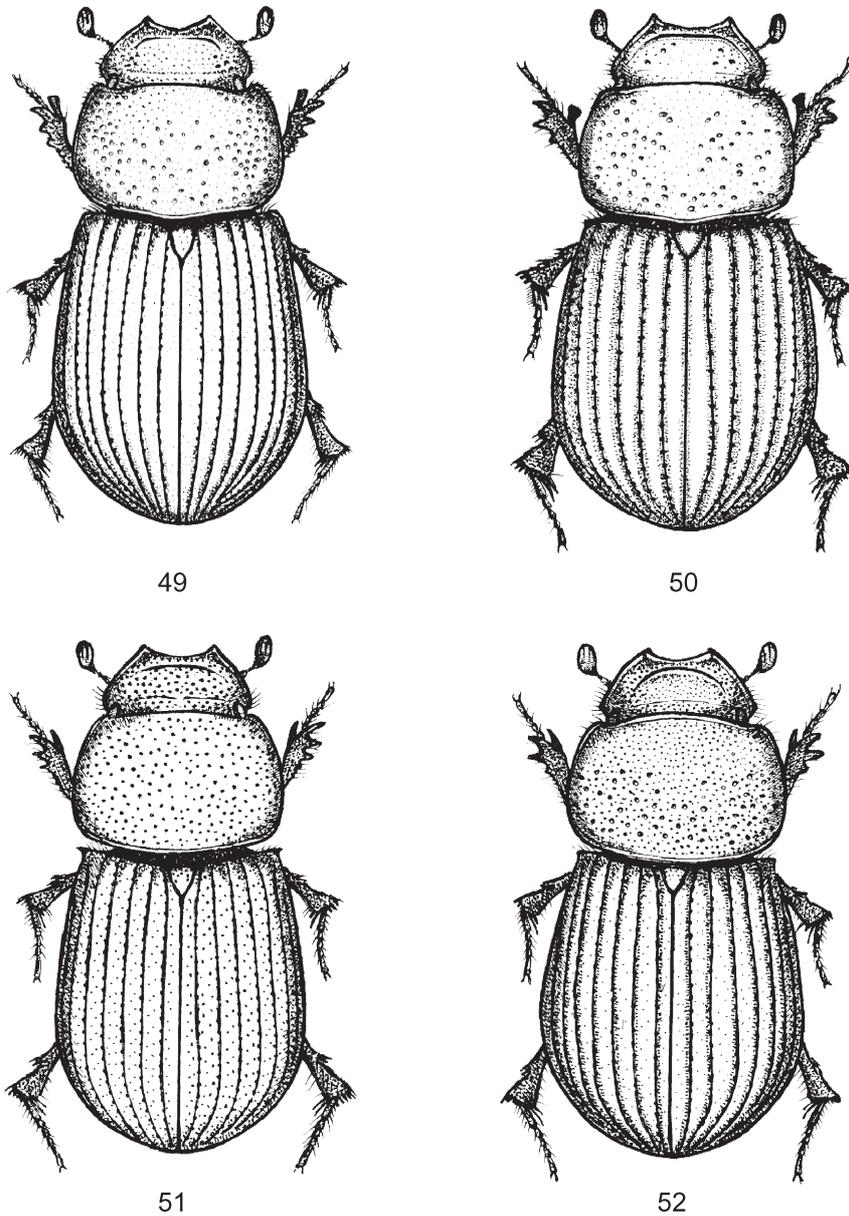
Ammoecius dogueti (BARAUD, 1980), **comb. n.**
(Figs 17–20, 23)

Aphodius (Ammoecius) dogueti BARAUD, 1980: 279; DELLACASA M. 1988: 338.

Type locality: Algérie, Djurdjura: Tikdja.

Type depository: BARAUD collection, Muséum national d'Histoire naturelle, Paris.

Material examined: Paratype: Algérie, Djurdjura, Chemin lac Goulmine, 1600 m, 12.07.1979, Males J. M. leg. (1 male, BCVLB); allotype: Algérie, Djurdjura, Tikdja, 19.05.1976, Doguet S. leg. (female, MNHNP, BARAUD Coll.).



Figs 49–52. Habitus of: 49 = *Ammoecius muchei* (PETROVITZ, 1962) (male, length 6.0 mm, Turkey: Vil. Kastamonu, Kastamonu env.), 50 = *A. satanas* (CARPANETO, 1976) (male, length 7.0 mm, Turkey: Vil. Antalya, 40 km S of Akseki, 3 km S Fersin), 51 = *A. felscheanus* REITTER, 1904 (male, length 3.5 mm, Algeria: Oran prov., Oued-Imbert), 52 = *A. dentatus* SCHMIDT, 1908 (male, length 4.0 mm, Morocco: Essaouira)

Description – Length 6.0–6.5 mm. Oblong-elongate, convex, shiny, glabrous (Fig. 23). Black; clypeal margin and legs dark brown-reddish; antennal club testaceous. Head with cupuliform epistoma alutaceous, mostly smooth, only sides with few large punctures, anteriorly with strong transverse carina feebly arcuate, in front of which regularly, finely and granulosely punctured; clypeus widely sinuate at middle, distinctly denticulate at sides, laterally thickly bordered, border slightly upturned; genae obtusely angulate, rather elongately ciliate, distinctly protruding more than eyes; frontal suture shown by finely impressed lateral vestiges only; frons very finely and sparsely punctured; epipharynx: Fig. 17; apex of corypha: Fig. 18. Pronotum broadly transverse, strongly convex, with extremely fine and regularly sparse punctation on disc, only with few large punctures on sides; latter subparallel, distinctly bordered; hind angles widely rounded; base not bisinuate, rather thickly bordered. Scutellum regularly triangular, slightly convex, nearly smooth. Elytra oval-elongate, strongly convex, feebly broadened backward, distinctly denticulate at shoulder; striae deep, coarsely punctured, moderately crenulate; interstices flat on disc, convex laterally and toward apex. Hind tibiae with superior apical spur as long as first tarsal segment; latter as long as following three combined. Male: large punctures on pronotal sides relatively more sparse; inferior apical spur of middle tibiae shortened, obliquely truncate and slightly inwardly hooked apically; aedeagus: Figs 19–20. Female: large punctures on pronotal sides relatively denser; inferior apical spur of middle tibiae rather elongate and regularly acuminate apically.

Distribution: Algeria (Djurdjura massif).

Ammoecius elevatus (OLIVIER, 1789)
(Figs 24–28)

Scarabaeus elevatus OLIVIER, 1789: 89.

Aphodius elevatus: FABRICIUS, 1801: 79.

Ammoecius elevatus: MULSANT, 1842: 30; HAROLD 1871: 14; DELLACASA *et al.* 2001: 83.

Aphodius (Ammoecius) elevatus: REITTER 1892: 183; d'ORBIGNY 1896: 205; SCHMIDT 1913: 125; SCHMIDT 1922: 69; BALTHASAR 1964: 77; BARAUD 1971: 66; DELLACASA M. 1988: 124.

Aphodius (Ammoecius) persimilis SCHATZMAYR, 1946: 62; DELLACASA M. 1988: 217 (as doubtful synonym of *numidicus*), **syn. n.**

Type locality: S.te-Baume, Var, France.

Type depository: Muséum national d'Histoire naturelle, Paris.

Type material: *Scarabaeus elevatus* OLIVIER, 1789: **neotype** (male, MNHNP), herewith designated, bearing the following labels: 1) white, printed: VAR, IV. 1982/ S.te-Baume/ Moraguès; 2) red, handwritten: *Scarabaeus elevatus* Olivier, 1789/ Neotypus ♂/ Dellacasa G. & Al. des. 2002; 3) white, handwritten: *Ammoecius/ elevatus* (Olivier, 1789)/ G. Dellacasa & Al., det. 2002.

Aphodius persimilis SCHATZMAYR, 1946: lectotype (male, MCSNM), herewith designated, bearing the following labels: 1) white: Laverdure [printed]/ 7.10.1929 [handwritten]/ Schatzmayr [printed]; 2) white, printed: A. elevatus/ det. Pittino 1979; 3) red, handwritten: *Aphodius/ persimilis* Schatzmayr, 1946/ lectotypus/ G. & M. Dellacasa des. 2002. Paralectotypes (2 males and 1 female, MCSNM) with the same labels of the lectotype. Paralectotype (1 female, MCSNM), bearing the following labels: 1) white: Laverdure [printed]/ 7.10.1929 [handwritten]/ Schatzmayr [printed]; 2) white, handwritten: sbp. *persimilis*/ Schatzm.; 3) white, printed: A. elevatus/ det. Pittino 1979; 4) red, handwritten: *Aphodius/ persimilis* Schatzmayr, 1946/ paralectotypus/ G. & M. Dellacasa des. 2002.

Description – Length 5.0–8.0 mm. Oblong-elongate, convex, shiny, glabrous (Fig. 24). Black, clypeal margin brown-reddish; legs dark brownish with tarsi paler; antennal club testaceous; sometimes ventral side and legs reddish and, more rarely, elytra brown-reddish also. Head with cupuliform epistoma rather finely and irregularly punctured on disc; punctation laterally coarser and irregularly granulose in front of transverse anterior carina; clypeus widely sinuate at middle, distinctly denticulate at sides, thickly bordered, border upturned; genae obtuse, elongately ciliate, distinctly protruding more than eyes; frontal suture finely impressed; frons sparsely punctured; epipharynx: Fig. 25; apex of corypha: Fig. 26. Pronotum broadly transverse, moderately convex, doubly punctured; large punctures deep, sparse on disc, denser on sides, mixed much finer punctures regularly scattered; anterior margin finely bordered to level of eyes; sides subparallel, thinly bordered; hind angles obtusely rounded; base feebly bisinuate, thickly bordered. Scutellum regularly triangular, somewhat convex, with few punctures very fine and irregularly sparse. Elytra oval-elongate, strongly convex, feebly backwardly broadened and with epipleural carina subdenticulate at shoulder; striae deep, coarsely punctured, distinctly crenulate; interstices flat on disc, moderately convex on pre-apical declivity, almost imperceptibly punctured. Hind tibiae with superior apical spur as long as first tarsal segment; latter as long as following three combined. Male: pronotum relatively more transverse, less convex and with large punctures more sparse; inferior apical spur of middle tibiae short, stout and inwardly curved apically; aedeagus: Figs 27–28. Female: pronotum relatively less transverse, more convex and with large punctures more dense; inferior apical spur of middle tibiae rather elongate and regularly acuminate apically.

Infraspecific names: Morpha: *edentulus* MULSANT, 1842 (= *chobauti* BÁGUENA, 1927; = *correllai* BALTHASAR, 1941): clypeal denticles, at sides of median sinuosity, notably reduced. Colour variation: *fusciventris* MULSANT, 1842: ventral side, legs and sometimes elytra brown-reddish.

Distribution: Southwestern Europe: Portugal, Spain, southern France, northwestern Italy (western Liguria); Mediterranean Africa (Morocco, Algeria, Tunisia, Libya).

Ammoecius eli (PETROVITZ, 1961), **comb. n.**
(Figs 16, 21)

Aphodius (Ammoecius) eli PETROVITZ, 1961: 347; BARAUD 1971: 67; DELLACASA M. 1988: 231.

Type locality: “Hilleh, Mesopotam.” [Iraq.]

Type depository: Muséum d’Histoire naturelle, Geneva.

Description of female – Length 5.0 mm. Short, oval, strongly convex, shiny, glabrous (Fig. 21). Blackish, head and pronotum sides shadowy brown-reddish; legs piceous; antennal club testaceous. Head with cupuliform epistoma distinctly, rather sparsely and subregularly punctured on disc, punctures laterally relatively larger; punctation granulo-rugose in front of short and distinctly raised anterior carina; clypeus angulately sinuate at middle, sharply denticulate at sides; denticles distinctly upturned, rather thickly bordered, border feebly upturned; genae obtusely rounded, elongately ciliate, feebly protruding more than eyes; frontal suture finely impressed; frons regularly distinctly punctured; epipharynx: Fig. 16. Pronotum moderately transverse, strongly convex, doubly subregularly punctured; larger punctures absent on anterior quarter, denser on sides; latter feebly rounded, distinctly bordered; hind angles widely rounded; base thickly bordered. Scutellum flat, with

few fine and sparse punctures on basal half. Elytra strongly convex, regularly oval, with small humeral denticle; striae rather fine and distinctly crenulate to preapical declivity wherein they are deep, not crenulate by large transverse punctures and as wide as interstices; latter faintly convex and sparsely punctured on disc, narrower and subcarinate preapically. Metasternal plate nearly flat, finely punctured. Hind tibiae with superior apical spur slightly shorter than first tarsal segment; latter shorter than following two combined.

Male unknown.

Distribution: Known only from type locality of the female holotype.

Remarks – We suspect that this taxon is a junior synonym of *Ammoecius lugubris* BOHEMAN, 1857 from South Africa, but we refrain from proposing a new synonymy because no male specimens have been studied.

Ammoecius felscheanus REITTER, 1904
(Figs 51, 73–76)

Ammoecius felscheanus REITTER, 1904: 255.

Aphodius (Ammoecius) felscheanus: SCHMIDT 1913: 126; BALTHASAR 1964: 78; BARAUD 1971: 68; DELLACASA M. 1988: 231.

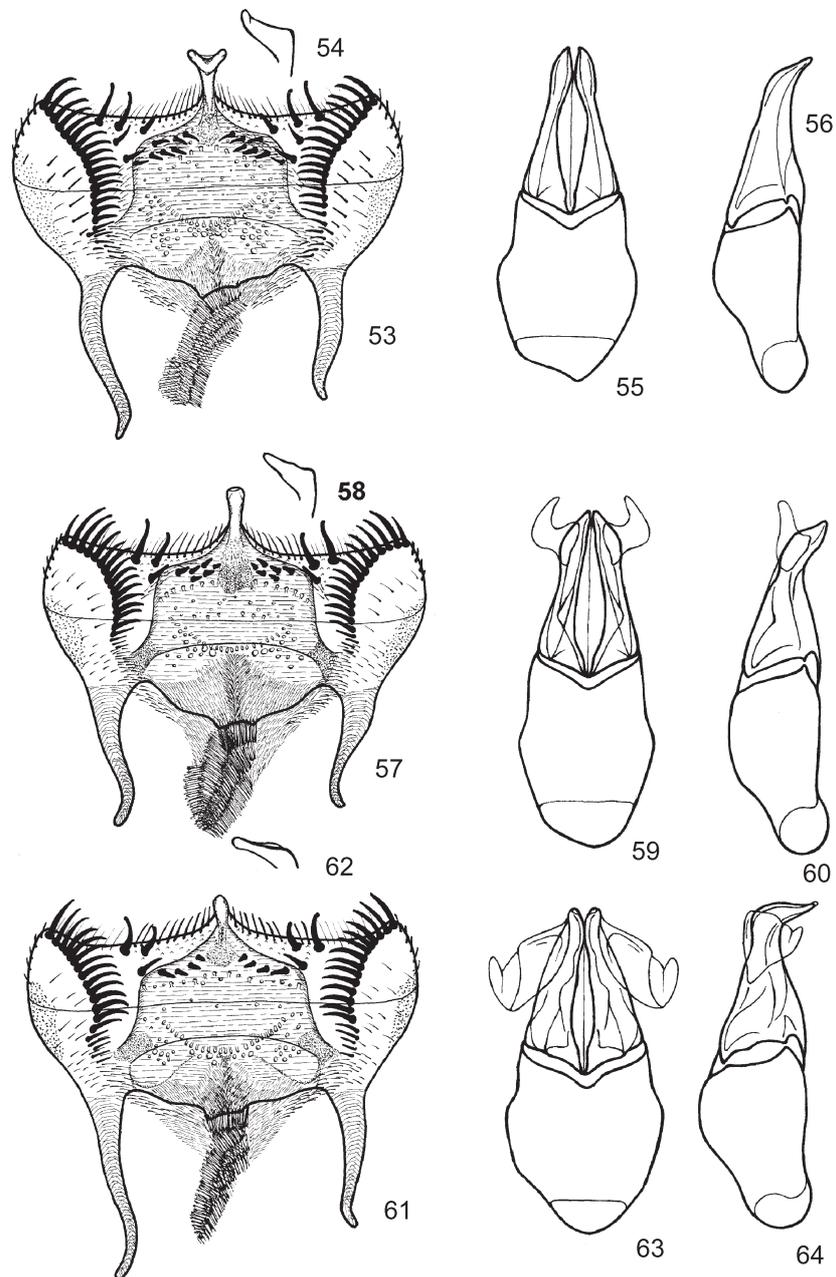
Type locality: “Algier”. [Algeria.]

Type depository: Hungarian Natural History Museum, Budapest.

Material examined: Holotype, male and 7 paratypes (3 males, 4 females): Algier, Reitter coll. (HNHMB); 1 male: Oued-Imbert, Oran Prov., Algeria (DCG).

Description – Length 3.5–4.0 mm. Short, oblong, strongly convex, shiny, glabrous (Fig. 51). Blackish; head toward clypeal margin shadowy reddish; legs brown-reddish; antennal club testaceous. Head with epistoma coarsely and subregularly punctured throughout, punctation somewhat finer in front of strongly raised transverse anterior carina; clypeus widely and distinctly sinuate at middle, subdentate at sides, thinly bordered; genae obtusely rounded, shortly ciliate, feebly protruding more than eyes; frontal suture finely impressed; frons coarsely and regularly punctured; epipharynx: Fig. 73; apex of corypha: Fig. 74. Pronotum transverse, strongly convex, simply, rather coarsely and regularly punctured, punctation somewhat denser laterally and mainly toward anterior angles; sides feebly rounded, very thinly bordered; hind angles widely rounded; base not bisinuate, distinctly bordered. Scutellum triangularly elongate with curved sides, sparsely and irregularly punctured on basal third. Elytra strongly convex, feebly broadened backward; shoulder with a very small denticle; striae fine, superficially punctured, faintly crenulate; interstices flat, rather sparsely but very distinctly punctured. Hind tibiae with superior apical spur slightly longer than first tarsal segment; latter longer than following two combined; aedeagus: Figs 75–76. Male: inferior apical spur of middle tibiae very short and obliquely truncate apically; metasternal plate concave. Female: inferior apical spur of middle tibiae normally shaped; metasternal plate flat.

Distribution: Algeria.



Figs 53–64. Epipharynx (53, 57, 61), apex of corypha (lateral view) (54, 58, 62) and aedeagus (dorsal and lateral view) (55–56, 59–60, 63–64) of: 53–56 = *Ammoecius rugifrons* AUBÉ, 1850, 57–60 = *A. lusitanicus* ERICHSON, 1848, 61–64 = *A. frigidus* BRISOUT, 1866

Ammoecius franzi (PETROVITZ, 1964), **comb. n.**
(Figs 66, 85–88)

Aphodius (*Ammoecius*) *franzi* PETROVITZ, 1964: 185; PETROVITZ 1968: 230 (male description);
BARAUD 1971: 62; DELLACASA M. 1988: 131.

Type locality: “Hoher Atlas, Ostseite, Circle de Jaffar”. [Morocco.]

Type depository: FRANZ H. collection, Wien.

Description – Length 5.0–6.0 mm. Oblong, strongly convex, shiny, glabrous (Fig. 66). Black; clypeal margin and legs brownish; antennal club dark testaceous. Head with cupuliform epistoma finely, distinctly and rather densely punctured; punctation somewhat denser laterally and almost irregular granulo-rugose in front of the rather short and moderately raised anterior transverse carina; clypeus subtriangularly sinuate at middle, subdenticulate at sides, latter distinctly bordered and regularly arcuate to genae that are feebly but distinctly auriculate, obtusely rounded, elongately ciliate and protruding more than eyes; frontal suture distinct, finely impressed; frons finely and subregularly punctured, punctures somewhat sparser and coarser than those on epistoma; epipharynx: Fig. 85; apex of corypha: Fig. 86. Pronotum moderately transverse, strongly convex, doubly punctured; larger punctures irregularly and sparsely scattered only on basal third of disc; much smaller ones regularly and densely sparse throughout, punctation slightly denser on sides; latter feebly arcuate, distinctly bordered; anterior margin finely bordered; hind angles obtusely rounded; base feebly bisinuate, distinctly bordered. Scutellum flat, finely and sparsely punctured near base. Elytra oval-elongate, strongly convex, not denticulate at shoulder; striae fine, faintly crenulate; interstices nearly flat, sparsely and almost imperceptibly punctured. Hind tibiae with superior apical spur distinctly longer than first tarsal segment; latter somewhat longer than following three combined. Male: inferior apical spur of middle tibiae shortened, apically truncate and inwardly abruptly bent; metasternal plate incavate; aedeagus: Figs 87–88. Female: inferior apical spur of middle tibiae elongate and regularly acuminate toward apex; metasternal plate nearly flat.

Distribution: Morocco (Haut Atlas, Moyen Atlas)

Ammoecius frigidus BRISOUT, 1866
(Figs 61–64, 82)

Ammoecius frigidus BRISOUT, 1866: 374; HAROLD 1871: 15.

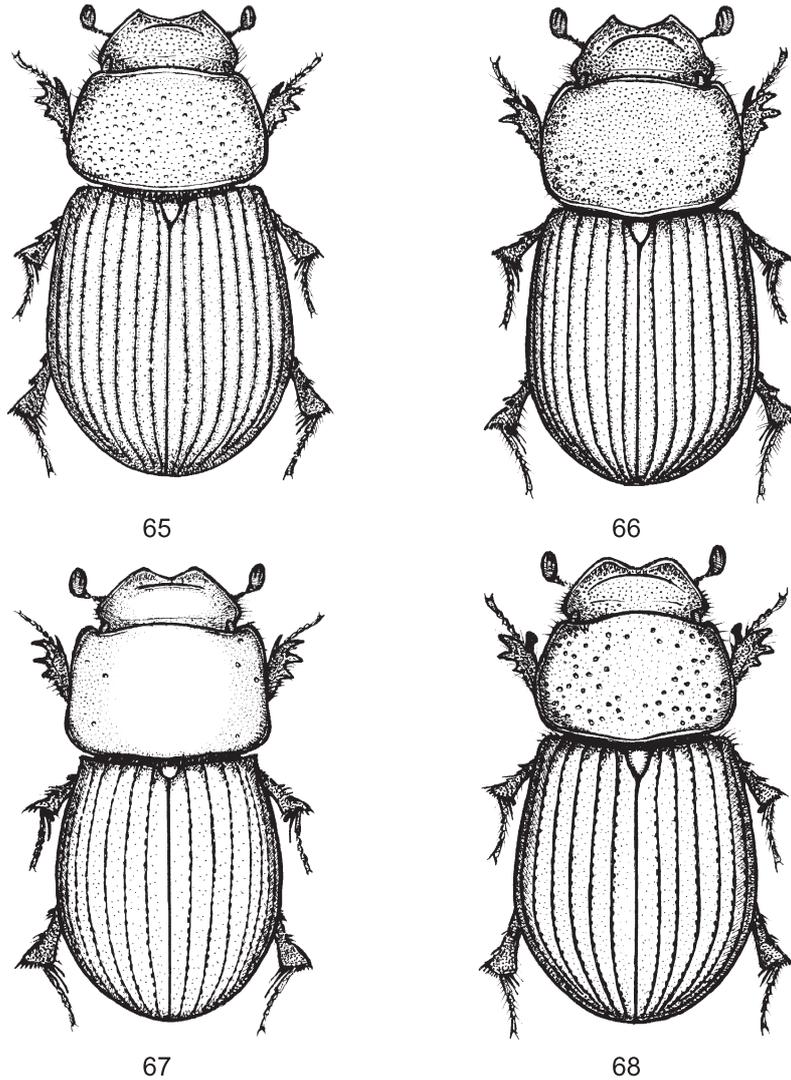
Aphodius (*Ammoecius*) *frigidus*: REITTER 1892: 184; d'ORBIGNY 1896: 206; SCHMIDT 1913: 125;
SCHMIDT 1922: 68; BALTHASAR 1964: 80; BARAUD 1971: 68; DELLACASA M. 1988: 132.

Type locality: “montagne de l'Escorial, La Granja”. [Spain.]

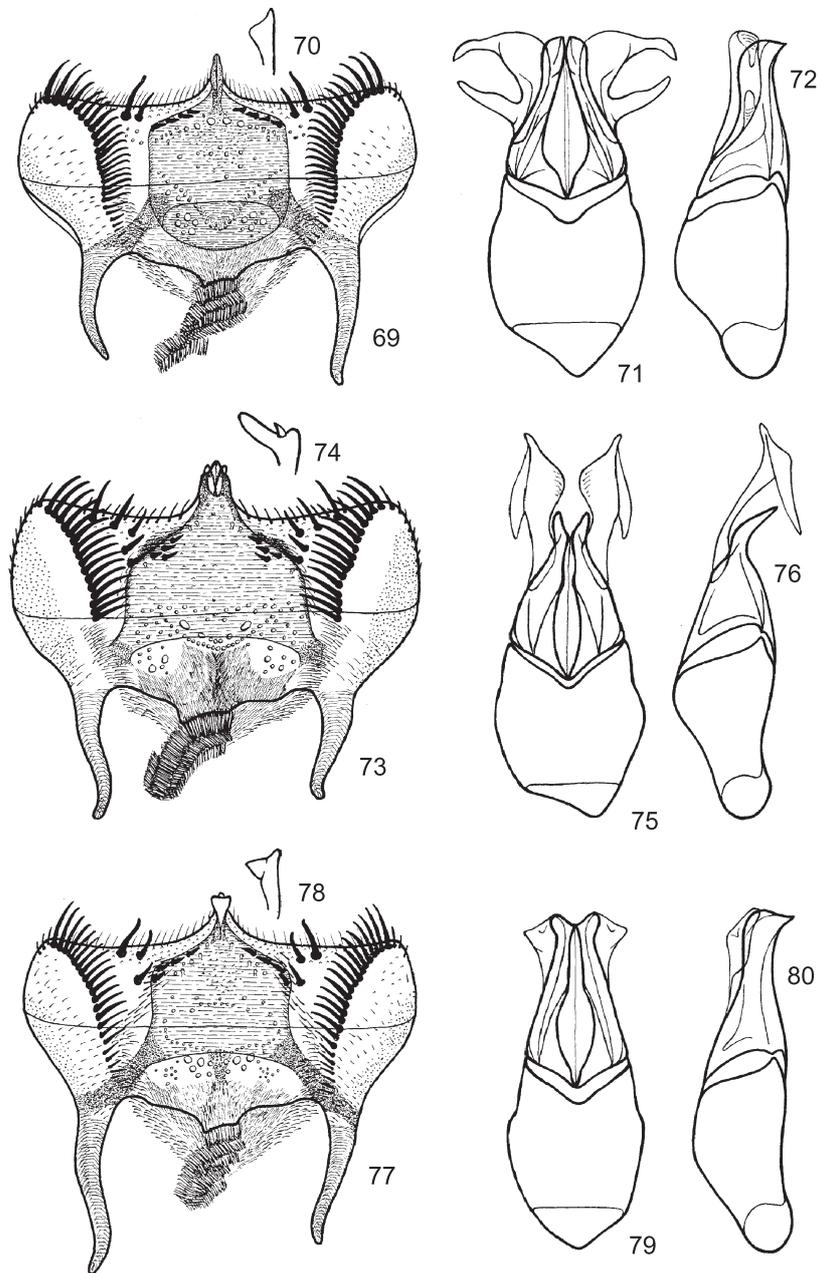
Type depository: Muséum national d'Histoire naturelle, Paris.

Description – Length 4.5–5.5 mm. Short, oval, strongly convex, shiny, glabrous (Fig. 82). Black; clypeal margin widely brown-reddish; legs piceous with brownish tarsi; antennal club testaceous. Head with cupuliform epistoma finely microreticulate, almost imperceptibly punctured on disc; punctation more distinct, somewhat irregular laterally and irregular granulate in front of an-

terior transverse carina; latter extended to level of genae; clypeus angulately sinuate at middle, obtusely rounded at sides, rather thickly bordered, border anteriorly upturned; genae obtusely rounded, rather shortly ciliate, feebly protruding more than eyes; frontal suture distinctly impressed; frons finely, subregularly and sparsely punctured; epipharynx: Fig. 61; apex of corypha: Fig. 62. Pronotum

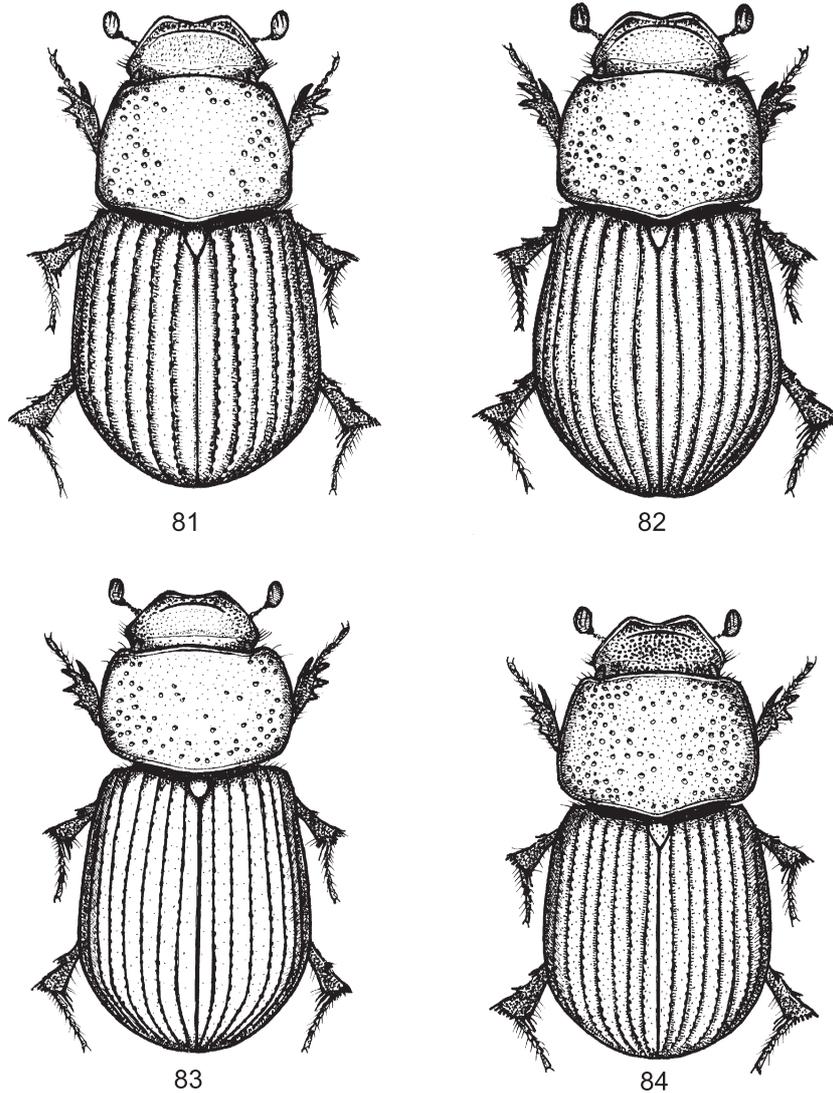


Figs 65–68. Habitus of: 65 = *Ammoecius numidicus* MULSANT, 1851 (male, length 4.5 mm, Algeria: Mahouna), 66 = *A. franzi* (PETROVITZ, 1964) (male, length 5.5 mm, Morocco: Oukaïmeden), 67 = *A. amplicollis* (PEYERIMHOFF, 1939) (male, length 5.0 mm, Morocco: Oukaïmeden), 68 = *A. meurguesae* CLÉMENT, 1975 (male, length 6.0 mm, Iran: Mandaran, Gachsar, Hezar Cin Mount)

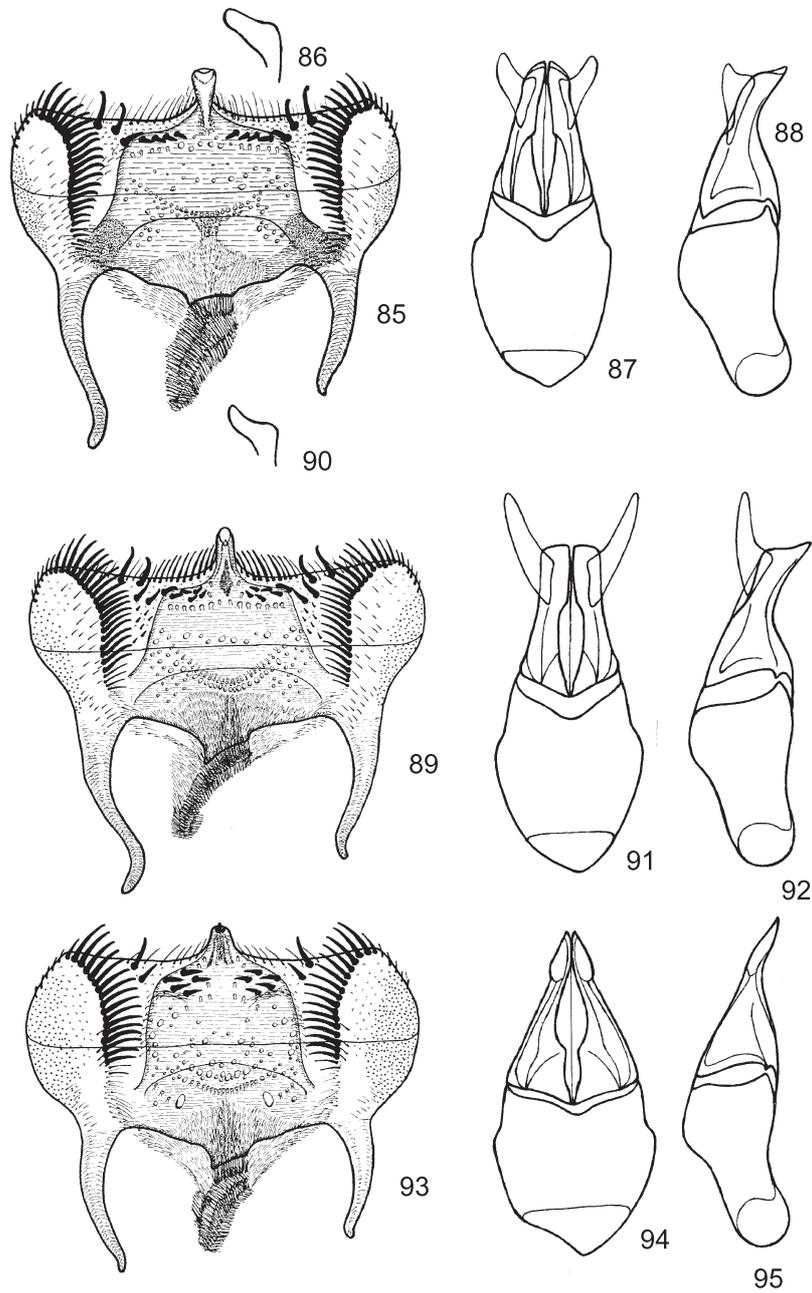


Figs 69–80. Epipharynx (69, 73, 77), apex of corypha (lateral view) (70, 74, 78) and aedeagus (dorsal and lateral view) (71–72, 75–76, 79–80) of: 69–72 = *Ammoecius amplicollis* (PEYERIMHOFF, 1939), 73–76 = *A. felscheanus* REITTER, 1904, 77–80 = *A. dentatus* SCHMIDT, 1908

transverse, moderately convex, doubly punctured; large punctures irregularly sparse, denser on sides, mixed very fine punctures almost imperceptible anteriorly on disc; anterior margin with lateral vestiges of fine border; sides feebly rounded, thinly bordered, somewhat inwardly sinuate before hind angles; latter obtusely rounded; base bisinuate, thickly bordered. Scutellum triangularly elongate,



Figs 81–84. Habitus of: 81 = *Ammoecius brevis* ERICHSON, 1848 (male, length 4.0 mm, Italy: Piedmont, Ghislarengo), 82 = *A. frigidus* BRISOUT, 1866 (male, length 5.0 mm, Portugal: Castelo Branco, Covilhã, Beida Baixa), 83 = *A. lusitanicus* ERICHSON, 1848 (male, length 5.0 mm, Spain: Cadiz, Sierra de Aljibe), 84 = *A. rugifrons* AUBÉ, 1850 (male, length 4.5 mm, Algeria: Mechroha)



Figs 85–95. Epipharynx (85, 89, 93), apex of corypha (lateral view) (86, 90) and aedeagus (dorsal and lateral view) (87–88, 91–92, 94–95) of: 85–88 = *Ammoecius franzi* (PETROVITZ, 1964), 89–92 = *A. numidicus* MULSANT, 1851, 93–95 = *A. incultus* (PETROVITZ, 1961)

sparsely and irregularly punctured on basal half. Elytra strongly convex, feebly broadened backward; epipleural carina subdenticulate at shoulder; striae deep, distinctly punctured, rather feebly crenulate; interstices slightly convex on disc, more distinctly convex on preapical declivity, almost imperceptibly punctured. Hind tibiae with superior apical spur longer than first tarsal segment; latter nearly as long as following three combined. Male: pronotum relatively more transverse, less convex and with large punctures sparser on disc; inferior apical spur of middle tibiae very short, obliquely truncate apically; metasternal plate moderately excavate; aedeagus: Figs 63–64. Female: pronotum relatively less transverse, more convex and with large punctures denser on disc; inferior apical spur of middle tibiae regularly elongate and apically acuminate; metasternal plate flat.

Infraspecific name: colour variation – *galaicus* (BÁGUENA, 1955): upper side chestnut-brown; ventral side reddish.

Distribution: Portugal, Spain, Morocco?

Remarks – The species is also cited from Morocco, but we have never studied specimens collected there.

Ammoecius incultus (PETROVITZ, 1961), **comb. n.**
(Figs 93–96)

Aphodius (*Ammoecius*) *incultus* PETROVITZ, 1961: 349; PETROVITZ 1964: 188; ENDRÓDI 1978: 180 (as synonym of *lugubris*); ENDRÓDI & RAKOVIČ 1981: 42 (as synonym of *lugubris*); DELLACASA M. 1988: 143.

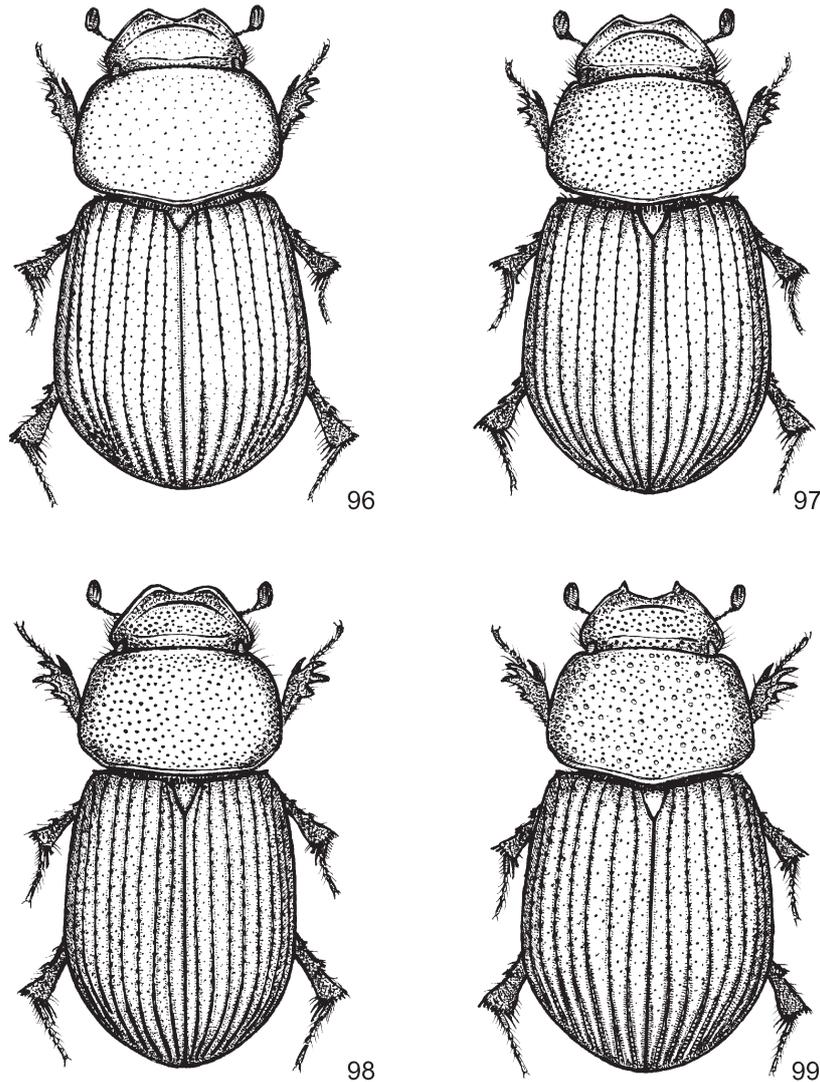
Type locality: “Südafrika: zwischen Middleburg and Cradock”. [South Africa.]

Type depository: Naturhistorisches Museum, Basel.

Description – Length 3.0–3.5 mm. Oblong-oval, convex, shiny, glabrous (Fig. 96). Piceous-blackish, clypeal margin and sometimes anterior margin of pronotum and elytra brown-reddish; legs brown-reddish; antennal club dark testaceous. Head with cupuliform epistoma simply, finely and sparsely punctured to the strong, sharply raised and laterally widened anterior carina in front of which the punctation is finely and sparsely granulo-rugose; epistomal disc relatively more sparsely punctured; clypeus deeply triangularly sinuate at middle, subdenticulate at sides, latter finely bordered and broadly rounded; genae obtusely rounded, elongately ciliate, feebly protruding more than eyes; frontal suture distinctly impressed; frons finely and very sparsely punctured; epipharynx: Fig. 93. Pronotum transverse, strongly convex, simply, sparsely and suregularly punctured, punctation on disc somewhat coarser than that on head, faintly denser on sides; latter feebly curved, rather thinly bordered, with maximum width after half; hind angles rounded; base slightly bisinuate, distinctly bordered. Scutellum almost regularly triangular, at base as wide as two first elytral interstices, smooth. Elytra regularly oval, strongly convex, faintly denticulate at shoulder; striae fine and feebly crenulate on disc, widened and superficially punctured preapically; interstices flat, finely and sparsely punctured on disc, feebly convex and almost imperceptibly punctured on preapical declivity. Middle tibiae with inferior apical spur elongate and regularly acuminate toward apex in both sexes. Hind tibiae with superior apical spur nearly as long as first tarsal segment; latter as long as fol-

lowing three combined. Male: metasternal plate relatively more distinctly excavate; aedeagus: Figs 94–95. Female: metasternal plate nearly flat.

Distribution: South Africa (Western Cape Province)



Figs 96–99. Habitus of: 96 = *Ammoecius incultus* (PETROVITZ, 1961) (male, length 3.0 mm, South Africa: S. W. Cape, Gansbaai 10 km NE), 97 = *A. terminatus* HAROLD, 1869 (male, length 3.5 mm, South Africa: S. W. Cape, Brackfontein farm), 98 = *A. mimus* (PÉRINGUEY, 1901) (male, length 4.5 mm, South Africa: Cape, Karroo, Olifantsulei farm), 99 = *A. lugubris* BOHEMAN, 1857 (male, length 4.0 mm, South Africa: Cap of Good Hope)

Remarks – This species was keyed by PETROVITZ (1964: 188) in the couplet including *Ammoecius lugubris*. ENDRÓDI (1978: 180) established the synonymy of *A. incultus* under *A. lugubris* without giving any justification for the nomenclatorial act. ENDRÓDI & RAKOVIČ (1981: 42) followed this interpretation. All of this seems to be the consequence of HAROLD's misinterpretation of the taxa. Based on the study of a paratype of *A. incultus* preserved in the Geneva Museum by P. BORDAT, we are able to restore it as *bona species*.

Ammoecius lugubris BOHEMAN, 1857
(Figs 99, 103–105)

Ammoecius lugubris BOHEMAN, 1857: 364.

Ammoecius bidentulus HAROLD, 1871: 19; DELLACASA M. 1988: 97, **syn. n.**

Aphodius (Ammoecius) dentinus PÉRINGUEY, 1901: 410; DELLACASA M. 1988: 119, **syn. n.**

Aphodius (Ammoecius) lugubris: PÉRINGUEY, 1901: 409; SCHMIDT 1922: 69; PETROVITZ 1964: 188; ENDRÓDI 1978: 179; ENDRÓDI & RAKOVIČ 1981: 42; DELLACASA M. 1988: 156.

Type locality: "Cap B. Spei". [Cape of Good Hope, South Africa.]

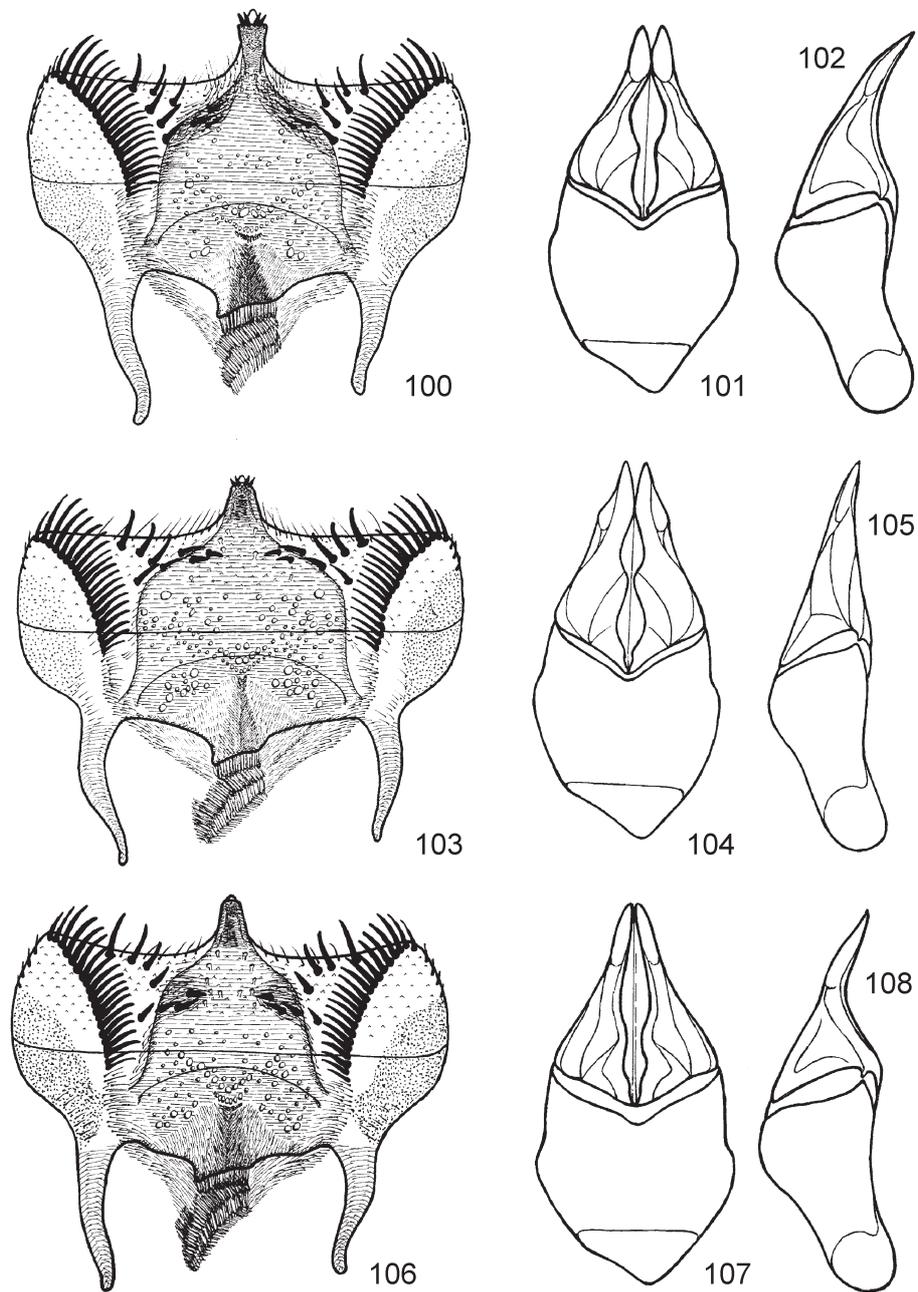
Type depository: Naturhistoriska Riksmuseet, Stockholm.

Type material: *Ammoecius lugubris* BOHEMAN, 1857: **lectotype** (female, NRS), herewith designated, bearing the following labels: 1) white, printed: Cap. B Spei; 2) white, printed: Victorin.; 3) white, printed: Type; 4) red, printed: Typus; 5) red, printed: 53; 6) blue, printed: Naturhistoriska Riksmuseet Stockholm; 7) red, handwritten: *Ammoecius lugubris* Boheman, 1857, lectotype ♀, P. Bordat des. 1993.

Ammoecius bidentulus HAROLD, 1871: **lectotype** (male, MNHNP), herewith designated, bearing the following labels: 1) white, handwritten: W; 2) white, handwritten: Schfuss [Schauffuss] N. 26; 3) white, handwritten: Cap. Bon sp.; 4) white, handwritten by Harold: *bidentulus* (Klug) Harold; 5) white, printed: Ex Musaeo E. Harold; 6) red, handwritten: *Ammoecius bidentulus* Harold, 1871, lectotype ♂, P. Bordat des. 1993.

Ammoecius dentinus (PÉRINGUEY, 1901): type, from "Potchefstr." [Potchefstroom, Transvaal] (sex not identified, SAMCT).

Description – Length 3.5–5.0 mm. Oblong-oval, convex, shiny, glabrous (Fig. 99). Piceous, clypeal and lateral margin of pronotum more or less distinctly reddish; legs brown-reddish; antennal club dark testaceous. Head with cupuliform epistoma simply, subregularly and rather coarsely punctured to the feebly raised and almost short anterior carina in front of which punctation is finely granulose with mixed small punctures; clypeus triangularly and rather deeply sinuate at middle, strongly denticulate at sides, denticles strongly upturned, very thinly bordered and widely rounded laterally; genae obtusely rounded, rather elongately and sparsely ciliate, protruding more than eyes; frontal suture finely impressed, laterally faint; frons coarsely punctured, punctures somewhat larger than on epistoma; epipharynx: Fig. 103. Pronotum transverse, strongly convex, doubly punctured, small punctures regularly scattered throughout, large punctures, three to five times larger than small ones, irregularly sparse on disc, denser on sides; latter feebly curved, finely bordered, with maximum width near base; hind angles obliquely subtruncate; base faintly bisinuate, distinctly bordered.



Figs 100–108. Epipharynx (100, 103, 106) and aedeagus (dorsal and lateral view) (101–102, 104–105, 107–108) of: 100–102 = *Ammoecius minus* (PÉRINGUEY, 1901), 103–105 = *A. lugubris* BOHEMAN, 1857, 106–108 = *A. terminatus* HAROLD, 1869

Scutellum triangularly elongate, at base as wide as two first elytral interstices, sparsely punctured on basal third. Elytra convex, moderately broadened backward and with very small humeral tooth; striae rather fine and crenulate on disc, deeper, wider, transversely punctured but not crenulate preapically; interstices feebly convex and finely punctured on disc, subcarinate at middle and narrowly explanate at each side near striae at elytral apex. Hind tibiae with superior apical spur somewhat longer than first tarsal segment; latter somewhat shorter than following three combined. Male: inferior apical spur of middle tibiae short, abruptly inwardly curved apically; aedeagus: Figs 104–105. Female: inferior apical spur of middle tibiae rather elongate and regularly acuminate toward apex.

Distribution: South Africa (Western and Southern Cape Province, Transvaal?).

Remarks – HAROLD (1871: 19) synonymized *Ammoecius terminatus* HAROLD, 1869 under *Ammoecius lugubris* BOHEMAN, 1857, based only on the original description of *A. lugubris*. Study of types of both taxa shows that they are two different species. On the other hand, *Ammoecius bidentulus*, described by HAROLD in the same paper (1871: 19), falls into synonymy with *A. lugubris*. SCHMIDT (1922) followed HAROLD's decision.

As *Ammoecius terminatus* is a good species, notable modifications happen to the interpretation of Afrotropical *Ammoecius*. For example, PÉRINGUEY (1901: 419), when placing *A. terminatus* among the species unknown to him or not surely identifiable, noted that it differs from *A. lugubris* by coarser punctation of head, clypeal carina more raised and not shortened, the elytral striae less convex toward apex and therefore described *Aphodius (Ammoecius) dentinus*.

Recent authors dealing with these taxa followed HAROLD's misinterpretation of *A. terminatus* and *A. lugubris* and, applying HAROLD's incorrect identification key, described several new species consistently increasing the number of Afrotropical *Ammoecius* taxa.

Ammoecius lusitanicus ERICHSON, 1848
(Figs 57–60, 83)

Ammoecius lusitanicus ERICHSON, 1848: 908; HAROLD 1871: 13.
Aphodius (Ammoecius) lusitanicus: REITTER 1892: 184; d'ORBIGNY 1896: 206; SCHMIDT 1913: 125; SCHMIDT 1922: 68; BALTHASAR 1964: 81; BARAUD 1971: 69; DELLACASA M. 1988: 156.

Type locality: Portugal.

Type depository: Museum für Naturkunde der Humboldt Universität, Berlin.

Description – Length 4.5–5.0 mm. Oblong, moderately convex, shiny, glabrous (Fig. 83). Blackish, elytra dark brownish; clypeal margin brown-reddish; legs brown-reddish with tarsi paler; antennal club testaceous. Head with epistoma strongly gibbous, finely, rather densely and subregularly punctured on disc; punctation somewhat larger and irregular laterally, subrugose in front of distinct anterior transverse carina. Clypeus widely sinuate at middle, obtusely rounded at sides, thinly

bordered, border feebly upturned anteriorly; genae angulose, shortly ciliate, distinctly protruding more than eyes; frontal suture finely impressed, somewhat gibbous at middle; frons finely, distinctly and subregularly punctured; epipharynx: Fig. 57; apex of corypha: Fig. 58. Pronotum transverse, moderately convex, doubly punctured; large punctures sparser on disc, somewhat denser on sides, fine punctures subregularly sparse throughout; anterior margin finely bordered; sides almost rounded, thinly bordered; hind angles obtusely rounded; base faintly bisinuate, rather thinly bordered. Scutellum regularly triangular, somewhat sunken, basally almost imperceptibly punctured. Elytra moderately convex, slightly broadened posteriorly; epipleural carina almost faint at shoulder; striae rather deep, superficially punctured, faintly crenulate; interstices flat on disc, slightly convex on preapical declivity, almost imperceptibly punctured. Hind tibiae with superior apical spur longer than first tarsal segment; latter somewhat shorter than following three combined. Male: pronotum relatively more transverse, with large punctures sparser on disc; middle tibiae with inferior apical spur very short, stout, obliquely truncate apically; metasternal plate deeply excavate; aedeagus: Figs 59–60. Female: pronotum relatively less transverse, with large punctures denser on disc; middle tibiae with inferior apical spur regularly elongate and acuminate apically; metasternal plate slightly concave.

Distribution: Portugal, Spain, Morocco?, Algeria?

Ammoecius meurguesae CLÉMENT, 1975
(Figs 33–36, 68)

Ammoecius meurguesae CLÉMENT, 1975a: 10; CLÉMENT 1975b: 26.

Aphodius (Ammoecius) hyrcanius PETROVITZ, 1980: 607; BARAUD 1981: 136 (as synonym of *meurguesae*); DELLACASA M. 1988: 339.

Aphodius (Ammoecius) meurguesae: BARAUD 1981: 136; DELLACASA M. 1988: 221.

Type locality: Karaj, Mazandaran, Iran.

Type depository: Muséum national d'Histoire naturelle, Paris.

Description – Length 5.5–6.5 mm. Oblong, strongly convex, very shiny, glabrous (Fig. 68). Black; clypeal margin brown-reddish; legs brownish with tarsi paler; antennal club testaceous. Head with cupuliform epistoma finely and regularly punctured on disc; punctation slightly coarser laterally and distinctly granulate in front of rather wide anterior transverse carina; clypeus subangulately sinuate at middle, obtusely angulate at sides, thickly bordered, border upturned; genae obtuse, elongately ciliate, distinctly protruding more than eyes; frontal suture almost faint at middle, finely impressed laterally; frons distinctly and sparsely punctured; epipharynx: Fig. 33; apex of corypha: Fig. 34. Pronotum moderately transverse, strongly convex, somewhat explanate near anterior angles, doubly punctured with large punctures sparse throughout and slightly denser on sides, mixed fine, almost imperceptible punctures subregularly scattered; sides feebly rounded, thickly bordered; hind angles obtusely rounded; base bisinuate, thickly bordered. Scutellum regularly triangular, flat, microreticulate, nearly smooth. Elytra strongly convex, feebly broadened backward; epipleural carina distinctly raised but not denticulate at shoulder; striae almost fine, rather superficially punctured, subcrenulate; interstices flat with extremely fine sparse punctures. Hind tibiae with superior apical spur slightly longer than first tarsal segment; latter as long as following three combined. Male: pronotum relatively more transverse, less convex and with large punctures sparser on disc; fore tibiae with apical spur plump, cylindrical, apically wide and spatulate; inferior apical spur of middle tibiae

very short, obliquely truncate and faintly inwardly hooked at apex; metasternal plate deeply excavate; aedeagus: Figs. 35–36. Female: pronotum relatively less transverse, more convex and with large punctures denser on disc; fore tibiae with apical spur rather short, stout, feebly outwardly curved, obtusely rounded at apex; middle tibiae with inferior apical spur rather short but regularly acuminate at apex; metasternal plate flat.

Distribution: Azerbaijan, Iran.

Remarks – A study of the type material of *Aphodius (Ammonoecius) hyrcanius* PETROVITZ, 1980 (MHNG) allows us to confirm its synonymy under *Ammonoecius meurguesae* CLÉMENT, 1975.

Ammonoecius mimus (PÉRINGUEY, 1901), **comb. n.**
(Figs 98, 100–102)

Aphodius (Ammonoecius) mimus PÉRINGUEY, 1901: 409; SCHMIDT 1922: 71; PETROVITZ 1964: 188; ENDRÓDI 1978: 179; ENDRÓDI & RAKOVIČ 1981: 42; DELLACASA M. 1988: 162.

Aphodius (Ammonoecius) kochi PETROVITZ, 1961: 348; DELLACASA M. 1988: 149, **syn. n.**

Aphodius (Ammonoecius) dukei ENDRÓDI, 1964: 105; DELLACASA M. 1988: 231, **syn. n.**

Type locality restricted: Hope Town. [Cape Town, South Africa.]

Type depository: South African Museum, Cape Town.

Description – Length 4.0–5.0 mm. Oblong, strongly convex, shiny, glabrous (Fig. 98). Piceous, clypeal margin, sides of pronotum and elytra more or less widely reddish; legs brown-reddish; antennal club dark testaceous. Head with cupuliform epistoma coarsely, densely and regularly punctured to the pliciform, rather elongate and slightly raised anterior carina in front of which punctation rather dense, coarse and somewhat irregular subrugose; clypeus distinctly sinuate at middle, widely rounded at sides, latter nearly straight, rather thickly bordered, border upturned; genae obtuse, elongately ciliate, distinctly protruding more than eyes; frontal suture deeply impressed; frons slightly depressed at middle, rather sparsely punctured; epipharynx: Fig. 100. Pronotum transverse, convex, simply, regularly and almost coarsely punctured, punctation somewhat denser on sides; latter distinctly bordered, feebly incurvate, maximum width near base; hind angles subtruncate, truncation feebly sinuate; base not bisinuate, distinctly bordered. Scutellum regularly triangular, at base as wide as first two elytral interstices, feebly convex and sparsely punctured on basal half. Elytra elongate, feebly broadened backward, almost imperceptibly denticulate at shoulder; striae fine, faintly crenulate on disc, progressively wider, faintly punctured and not crenulate at all toward apex; interstices feebly convex on disc, more convex on preapical declivity, finely and sparsely punctured. Hind tibiae with superior apical spur as long as first two tarsal segments; first segment distinctly shorter than following three combined. Male: inferior apical spur of middle tibiae shortened, abruptly inwardly curved apically; aedeagus: Figs 101–102. Female: inferior apical spur of middle tibiae elongate and regularly acuminate toward apex.

Distribution: South Africa (Cape Province)

Remarks – In the original diagnosis, PÉRINGUEY (1901: 409) noted: “clypeus [...] with the sides of emargination angular” and later “elytra [...] with the intervals a little costate in the anterior part, but much more distinctly so from the middle to the apex, where they are carinate and impunctate”. These characters cannot be verified by the syntypes preserved in the South African Museum.

SCHMIDT (1922: 71) apparently did not see this taxon and dealt with it on the basis of the original description only. PETROVITZ (1961) described *A. kochi* and ENDRŐDI (1964) *A. dukei* but they did not give any distinguishing character from the other Afrotropical *Ammoecius*.

Later, PETROVITZ (1964: 188) stated that *A. mimus* is insufficiently described, though in his key he distinguished *A. dukei*, *A. mimus*, and *A. kochi* on the basis of morphological characters mentioned in their original descriptions. ENDRŐDI and RAKOVIČ (1981: 31) dealt with these taxa in the same manner, stating that they had difficulties in tracing the type material.

A study of a paratype of *A. kochi* PETROVITZ preserved in the Geneva Museum, as well as a paratype of *A. dukei* ENDRŐDI preserved in the Hungarian Natural History Museum (Budapest), allowed P. BORDAT to determine that these taxa are identical. In addition, the study of six syntypes of *Ammoecius mimus* from “Hope Town” (one “brochette” of 2×3 specimens) bearing a handwritten label by PÉRINGUEY: “*Aphodius mimus* Typ. PY”, allows us to state that *A. mimus*, *A. dukei* and *A. kochi* represent the same taxon because no distinguishing characters exist in the specimens. Finally, examination of a specimen identified as *Aphodius mimus* PÉRINGUEY, labelled “Colonie du Cap, Steynsburg, R. Ellenberg 1915; compared with type by B.-O. Landin”, preserved in the Paris Museum, confirmed the correct interpretation of PÉRINGUEY’s species by this author.

Ammoecius muchei (PETROVITZ, 1962), **comb. n.**
(Figs 41–44, 49)

Aphodius (Ammoecius) muchei PETROVITZ, 1962: 110; BARAUD 1971: 67; DELLACASA M. 1988: 165.

Type locality: “İlgas dağı, Umgebung der Passstrasse, Anatolien” [Turkey].
Type depository: Muséum d’Histoire naturelle, Geneva.

Description – Length 6.0–6.5 mm. Oblong, strongly convex, shiny, glabrous (Fig. 49). Black; clypeal margin brown-reddish; legs dark brownish with tarsi paler; antennal club yellowish. Head with cupuliform epistoma microreticulate, finely and rather sparsely punctured on disc; punctation laterally coarser with a few large punctures mixed and irregularly granulate in front of short and sharply raised anterior transverse carina; clypeus angulately sinuate at middle, denticulate at sides, thickly bordered, border distinctly upturned; genae obtusely rounded, elongately ciliate, protruding

more than eyes; frontal suture finely impressed; frons finely and sparsely punctured; epipharynx: Fig. 41; apex of corypha: Fig. 42. Pronotum transverse, strongly convex, doubly punctured; large punctures somewhat sparser on disc, much denser on sides and toward base, mixed punctures extremely fine and subregularly scattered; sides subparallel, thickly bordered; hind angles obtusely rounded; base bisinuate, thickly bordered. Scutellum triangularly elongate, slightly sunken, feebly convex, sparsely and very finely punctured. Elytra strongly convex, feebly broadened posteriorly; epipleural carina distinctly raised but not denticulate at shoulder; striae deep, almost fine, on disc superficially punctured and subcrenulate, laterally coarsely punctured and distinctly crenulate; interstices flat on disc, feebly convex on preapical declivity, almost imperceptibly punctured. Hind tibiae with superior apical spur somewhat longer than first tarsal segment; latter slightly longer than following three combined. Male: pronotum relatively more transverse, less convex and with large punctures more sparse on disc; fore tibiae with apical spur plump, cylindrical, faintly inwardly hooked at apex; inferior apical spur of middle tibiae with short and obliquely truncate at apex; metasternal plate feebly excavate; aedeagus: Figs 43–44. Female: pronotum relatively less transverse, more convex and with large punctures denser on disc; fore tibiae apical spur outwardly curved and apically acuminate; metasternal plate flat.

Distribution: More or less widespread in central Turkey; Greece?.

Remarks – We studied a male specimen from Greece (Alexandropolis), preserved in PIEROTTI's collection at the Genoa Museum, but the collecting record needs to be confirmed.

Ammoecius naviauxi (BARAUD, 1971) **comb. n.**
(Figs 22, 37–40)

Aphodius (*Ammoecius*) *naviauxi* BARAUD, 1971: 66; DELLACASA M. 1988: 116.

Type locality: Slennfé, Syrie. [Syria.]

Type depository: BARAUD collection, Muséum national d'Histoire naturelle, Paris.

Type material: Holotype, male: Slennfé, Syrie, 07.05.1970, Naviaux R. leg.

Description – Length 5.5 mm. Short, oval, strongly convex, shiny, glabrous (Fig. 22). Black; clypeal margin and legs piceous; antennal club testaceous. Head with cupuliform epistoma densely, irregularly and subrugosely punctured to the almost narrow and nearly straight anterior carina in front of which the subrugose punctation somewhat finer and superficial; clypeus widely sinuate at middle, distinctly denticulate at sides, laterally rather thinly bordered, border faintly upturned; genae obtusely rounded, sparsely ciliate, distinctly protruding more than eyes; frontal suture fine, slightly raised; frons almost coarsely and regularly punctured; epipharynx: Fig. 37; apex of corypha: Fig. 38. Pronotum strongly transverse, somewhat larger than elytral base, doubly punctured, fine punctures subregularly scattered throughout, mixed larger punctures very sparse on disc toward base, much denser on sides; latter subparallel, thinly bordered; anterior angles distinct, thickly bordered; hind angles widely rounded; base feebly bisinuate, distinctly bordered, border faintly sunk. Scutellum very small, regularly triangular, feebly convex, smooth. Elytra short, oval, broadened posteriorly, distinctly denticulate at shoulder and with strong epipleural carina; striae deep, rather fine, feebly

crenulate with punctures moderately impressed, more coarsely punctured and distinctly crenulate laterally and on preapical declivity; interstices moderately convex on disc, more strongly convex laterally and preapically, sparsely and almost imperceptibly punctured. Hind tibiae with superior apical spur as long as first tarsal segment; latter as long as following three combined. Male: fore tibiae with apical spur stout, downward bent, regularly acuminate toward apex; inferior apical spur of middle tibiae shortened, obliquely truncate and somewhat inwardly hooked apically; aedeagus: Figs 39–40. Female: unknown.

Distribution: Known only from the type locality.

Ammoecius numidicus MULSANT, 1851
(Figs 65, 89–92)

Ammoecius numidicus MULSANT, 1851: 52; BARAUD 1971: 75; DELLACASA M. 1988: 170.

Type locality: “Mahouna, Algérie”. [Algeria.]

Type depository: Muséum national d’Histoire naturelle, Paris.

Type material: *Ammoecius numidicus* MULSANT, 1851: **neotype** (male, MNHNP), herewith designated, bearing the following labels: 1) white, handwritten: Algérie/ S. Doguet; 2) white, handwritten: Mahouna/ 26.X.1970; 3) red, handwritten: *Ammoecius/ numidicus* MULSANT, 1851/ Neotypus ♂/ G. Dellacasa & Al., des. 2002.

Description – Length 4.5–5.0 mm. Rather short, oblong, strongly convex, shiny, glabrous (Fig. 65). Black, clypeal margin faintly reddish; legs dark brownish; antennal club testaceous. Head with cupuliform epistoma finely regularly and almost densely punctured to the sharply raised anterior transverse carina in front of which the punctation is finely granulo-rugose; clypeus deeply sinuate at middle, subdenticulate at sides, latter distinctly bordered and regularly arcuate to genae; latter obtusely rounded, elongately ciliate, feebly protruding more than eyes; frontal suture very finely impressed; frons rather densely, finely and regularly punctured; epipharynx: Fig. 89; apex of corypha: Fig. 90. Pronotum transverse; strongly convex, doubly punctured; larger punctures irregularly scattered on the basal two thirds of disc, denser on sides; smaller ones regularly and not very densely throughout sparse; anterior margin finely bordered; hind angles subtruncate; base not bisinuate, rather thickly bordered. Scutellum regularly triangular, flat, with a few fine punctures on basal half. Elytra short, oval, strongly convex, not denticulate at shoulder; striae rather fine, superficially punctured, very feebly crenulate; interstices faintly convex, imperceptibly punctured. Hind tibiae with superior apical spur distinctly longer than first tarsal segment; latter as long as following three combined. Male: inferior apical spur of middle tibiae shortened, apically truncate and inwardly abruptly bent; metasternal plate concave; aedeagus: Figs 91–92. Female: inferior apical spur of middle tibiae elongate and regularly acuminate toward apex; metasternal plate nearly flat.

Distribution: Algeria, Tunisia, Sicily?

Remarks – In the OBERTHÜR’s collection at the Paris Museum two specimens (male and female) labelled “Sicilia” are preserved but we did not study any other specimen collected there.

Ammoecius rugifrons AUBÉ, 1850
(Figs 53–56, 84)

Ammoecius rugifrons AUBÉ, 1850: 335; HAROLD, 1871: 10.

Ammoecius levaillanti GODART, 1852: 297; REICHE 1852: LIX (as synonym of *rugifrons*).

Aphodius (Ammoecius) rugifrons: REITTER 1892: 184; d'ORBIGNY 1896: 206; SCHMIDT 1913: 125; SCHMIDT 1922: 70; BALTHASAR 1964: 80; BARAUD 1971: 69; DELLACASA M. 1988: 192.

Type locality: "Algérie". [Algeria.]

Type depository: Muséum national d'Histoire naturelle, Paris.

Description – Length 4.0–5.0 mm. Short, feebly oval, strongly convex, shiny, glabrous (Fig. 84). Black; clypeal margin brown-reddish; legs brown-reddish with tarsi paler; antennal club testaceous. Head with strongly convex epistoma coarsely and subrugosely punctured; punctation distinctly granulate in front of the short and moderately raised anterior carina; clypeus angulately sinuate at middle, obtusely rounded at sides, thickly bordered, border distinctly upturned; genae obtusely rounded, rather shortly ciliate, protruding more than eyes; frontal suture finely impressed, faintly gibbous at middle; frons coarsely and subregularly punctured; epipharynx: Fig. 53; apex of corypha: Fig. 54. Pronotum subquadrate, strongly convex, doubly punctured; large punctures sparse on disc but much denser on sides, mixed distinct fine punctures regularly scattered; anterior margin very finely bordered; sides feebly rounded, thinly bordered; hind angles widely rounded; base distinctly bisinuate, thickly bordered. Scutellum regularly triangular, coarsely and rather densely punctured. Elytra strongly convex, somewhat broadened backwardly; epipleural carina distinct but not denticulate at shoulder; striae large and deep, rather superficially punctured, subcrenulate; interstices feebly convex on disc, more convex on preapical declivity, finely, sparsely punctured. Hind tibiae with superior apical spur longer than first tarsal segment; latter nearly as long as following three combined. Male: epistoma relatively more distinctly and less coarsely punctured; pronotal disc with large punctures more sparse; middle tibiae with inferior apical spur short, stout and obliquely truncate apically; metasternal plate deeply excavate; aedeagus: Figs 55–56. Female: epistoma relatively more irregularly and more coarsely punctured; pronotal disc with large punctures rather dense; middle tibiae with inferior apical spur elongate and regularly acuminate apically; metasternal plate flat.

Distribution: Italy (western Sardinia, Sicily?), Tunisia, Algeria.

Remarks – In LUIGIONI's catalogue (1929: 373), this species is cited from Sicily (Etna) but we did not study any specimen collected there.

Ammoecius satanas (CARPANETO, 1976), **comb. n.**
(Figs 29–32, 50)

Aphodius (Ammoecius) satanas CARPANETO, 1976: 243; DELLACASA M. 1988: 194.

Type locality: Çamlık env., south Beleşhir Lake, m. 1200, Vil. Konya. [Turkey.]

Type depository: Università di Roma "La Sapienza", Rome.

Material examined: Vil. Antalya, 40 km S Akseki, 3 km S Fersin, 650 m, 06.05.1989, Pittino L. & R. leg. (1 male, PCM); Sertavul Geç., Südseite, ca. 1400 m (Waldzone), 22.04.1981, Anatolia mer., Heinz leg. (1 female, DCG).

Description – Length 6.5–7.5 mm. Oblong, strongly convex, very shiny, glabrous (Fig. 50). Blackish, clypeal margin and anterior angles of pronotum faintly reddish; legs brownish; antennal club dark testaceous. Head with epistoma doubly irregularly punctured on disc, few large punctures sparse laterally, mixed extremely fine ones becoming imperceptible at center; punctation in front of anterior strong and wide carina simple, regular, somewhat denser and relatively more distinct; clypeus broadly sinuate at middle, strongly denticulate at sides, rather thickly bordered, border up-turned; genae obtusely rounded, rather elongately ciliate, protruding more than eyes; frontal suture obsolete at middle, almost faint laterally; frons finely punctured on sides only; epipharynx: Fig. 29; apex of corypha: Fig. 30. Pronotum moderately transverse, strongly convex, doubly punctured; large punctures irregularly sparse, somewhat denser on sides, very fine ones mixed and regularly scattered throughout; anterior margin with vestiges of border to level of eyes; sides feebly rounded, thinly bordered, border shortly bristled toward front angles; hind angles obtusely rounded; base faintly bisinuate, rather thinly bordered. Scutellum feebly convex, with curved sides, with trace of lateral border; basally finely punctured. Elytra oblong elongate, subdenticulate at shoulder; striae rather deeply impressed, coarsely punctured, strongly crenulate; interstices nearly flat on disc, feebly convex laterally, imperceptibly punctured. Hind tibiae with superior apical spur longer than first tarsal segment; latter nearly as long as following three combined. Male: fore tibiae with apical spur spatulate and feebly broadened apically at each side; inferior apical spur of middle tibiae very short and obliquely truncate apically; metasternal plate concave; aedeagus: Figs 31–32. Female: fore tibiae with apical spur, as well as inferior apical spur of middle tibiae, regularly acuminate toward apex; metasternal plate nearly flat.

Distribution: Southern Turkey.

Ammoecius terminatus HAROLD, 1869

(Figs 97, 106–108)

Ammoecius terminatus HAROLD, 1869: 100; HAROLD 1871: 18 (as synonym of *lugubris*).

Aphodius (Ammoecius) terminatus: SCHMIDT 1922: 69 (as synonym of *lugubris*); ENDRŐDI & RAKOVIČ 1981: 42 (as synonym of *lugubris*); DELLACASA M. 1988: 207 (as synonym of *lugubris*).

Aphodius (Ammoecius) orycis ENDRŐDI, 1980: 34; DELLACASA M. 1988: 339, **syn. n.**

Aphodius (Ammoecius) orycoides ENDRŐDI, 1980: 34; DELLACASA M. 1988: 339, **syn. n.**

Type locality: Cap. [Cape Town, South Africa.]

Type depository: Muséum national d'Histoire naturelle, Paris.

Type material: *Ammoecius terminatus* HAROLD, 1869: **lectotype**, (female, MNHNP), here-with designated, bearing the following labels: 1) white, handwritten: Cap. *A. viduus* Dej; 2) white, handwritten by Harold: *terminatus* Typ. Hrd; 3) white, printed: Ex Musaeo E. Harold; 4) red, printed: TYPE; 5) red, handwritten: *Ammoecius terminatus* HAROLD, 1869, Lectotype ♀, P. Bordat des. 2001.

Aphodius (Ammonoecius) orycis ENDRŐDI, 1980: holotype (male, TMP): S. Afr. Namaq Coast, Gemsbok vlakte.

Aphodius (Ammonoecius) orycoides ENDRŐDI, 1980: holotype (female, TMP): S. Afr. Namaq Coast, Gemsbok vlakte.

Description – Length 3.5–5.5 mm. Oblong, convex, shiny, glabrous (Fig. 97). Piceous-black; clypeal margin, sides of pronotum and elytra more or less widely brown-reddish; legs dark brownish; antennal club dark testaceous. Head with cupuliform epistoma coarsely and regularly punctured to the arcuate, rather elongate and distinctly raised anterior carina in front of which the punctation is rather fine and sparse; clypeus widely sinuate at middle, subdenticulate and upturned at sides, latter feebly curved and thinly bordered; genae obtusely rounded, elongately ciliate, feebly protruding more than eyes; frontal suture distinctly impressed; frons coarsely and regularly punctured, faintly depressed at middle; epipharynx Fig. 106. Pronotum transverse, strongly convex, simply, regularly and almost coarsely punctured, punctation somewhat denser on sides; latter moderately arcuate, distinctly bordered, maximum width near base; hind angles subtruncate; base faintly bisinuate, rather thickly bordered. Scutellum regularly triangular, at base as wide as two first elytral interstices, sparsely punctured on basal half. Elytra rather elongate, moderately widened backward, almost imperceptibly denticulate at shoulder; striae fine and faintly crenulate on disc, somewhat wider and not crenulate at all toward apex; interstices nearly flat on disc, moderately convex preapically, finely and sparsely punctured. Hind tibiae with superior apical spur longer than first tarsal segment; latter faintly shorter than following three combined. Male: inferior apical spur of middle tibiae shortened, abruptly inwardly curved apically; aedeagus: Figs 107–108. Female: inferior apical spur of middle tibiae elongate and regularly acuminate toward apex.

Distribution: South Africa (Northern and Western Cape Province, Namaqualand).

Remarks – HAROLD (1869: 100) described *Ammonoecius terminatus* comparing it with *A. lugubris* BOHEMAN, but later (1871: 18) he considered them synonyms. Subsequent authors did not verify this synonymy, and accepted HAROLD's decision. Based on a study of the types, P. BORDAT determined that they are two different species.

In 1980, ENDRŐDI described *Aphodius (Ammonoecius) orycis* and *Aphodius (Ammonoecius) orycoides* comparing them with *Aphodius (Ammonoecius?) brevitarsis* PÉRINGUEY. The examination of the type material showed that distinguishing characters mentioned by ENDRŐDI (e.g. shape of elytral striae) for separating *A. orycis* from *A. orycoides* are inadequate, resulting in the decision that they are junior synonyms of *Ammonoecius terminatus*. On the other hand, BORDAT (1990: 135) moved *Aphodius brevitarsis* from *Ammonoecius* to *Australaphodius* based on its morpho-anatomical characteristics.

CATALOGUE

Ahermodontus BÁGUENA, 1930

Type species: *Ahermodontus marini* BÁGUENA, 1930 (monotypy)

ambrosi (PARDO ALCAIDE, 1936) – Spain, Morocco

bischoffi (VŠETEČKA, 1939) – Albania

marini BÁGUENA, 1930 – Spain

Ammoecius MULSANT, 1842

Type species: *Scarabaeus elevatus* OLIVIER, 1789 (monotypy)

amplicollis (PEYERIMHOFF, 1939) – Morocco (Haut Atlas)

brevis ERICHSON, 1848 – Europe: northwards up to Sweden, in south from Spain to Georgia (missing from southern Italy, Sardinia, Sicily, Greece and European Turkey); Asia: Turkmenistan, Mongolia, Siberia (missing from Asia Minor)

dentatus SCHMIDT, 1908 – Portugal (Algarve), Spain (Andalusia), Morocco

dogueti (BARAUD, 1980) – Algeria

elevatus (OLIVIER, 1789) – southwestern Europe (Portugal, Spain, southern France, northwestern Italy: western Liguria); Mediterranean Africa (Morocco, Algeria, Tunisia, Libya)

= *chobauti* (BÁGUENA, 1927)

= *corellai* (BALTHASAR, 1941)

= *persimilis* (SCHATZMAYR, 1946)

= m. *edentulus* MULSANT, 1842

= ab. *fusciventris* MULSANT, 1842

eli (PETROVITZ, 1961) [doubtful species] – Iraq

felscheanus REITTER, 1904 – Algeria, Morocco(?)

franzi (PETROVITZ, 1964) – Morocco (Haut Atlas, Moyen Atlas)

frigidus BRISOUT, 1866 – Portugal, Spain, Morocco(?)

= ab. *galaicus* (BÁGUENA, 1955)

incultus (PETROVITZ, 1961) – South Africa (Cape Province)

lugubris BOHEMAN, 1857 – South Africa (Cape Province)

= *bidentulus* HAROLD, 1871

= *dentinus* (PÉRINGUEY, 1901)

lusitanicus ERICHSON, 1848 – Portugal, Spain, Morocco(?), Algeria(?)

meurguesae CLÉMENT, 1975 – Azerbaijan, Iran

= *hyrcanius* (PETROVITZ, 1980)

mimus (PÉRINGUEY, 1901) – South Africa (Cape Province)

= *dukei* (ENDRÓDI, 1964)

= *kochi* (PETROVITZ, 1961)

muche (PETROVITZ, 1962) – central Turkey, Greece(?)

naviauxi (BARAUD, 1971) – Syria

numidicus MULSANT, 1851 – Algeria, Morocco, Tunisia, Sicily(?)

rugifrons AUBÉ, 1850 – Algeria, Tunisia, Italy (western Sardinia, Sicily?)

= *levaillant* GODART, 1852

satanas (CARPANETO, 1976) – Turkey

terminatus HAROLD, 1869 – South Africa (Northern and Western Cape Province, Namaqualand)

= *orycis* ENDRÓDI, 1980

= *orycoides* ENDRÓDI, 1980

= *viduus* (Dejean, 1833) [*nomen nudum*]

Vladimirellus M. DELLACASA, G. DELLACASA et BORDAT, 2003

Type species: *Aphodius socors* BALTHASAR, 1967 (herewith designated)

socors (BALTHASAR, 1967) – Siberia

*

Acknowledgements – Our grateful thanks are due to: Y. CAMBEFORT (Paris), M. COCHRANE (Cape Town), G. CUCCODORO (Geneva), J. FERRER (Stockholm), J. JELÍNEK (Prague), I. LÖBL (Geneva), O. MERKL (Budapest), O. MONTREUIL (Paris), R. MÜLLER (Pretoria), R. PITTINO (Milan), F. RIGATO (Milan), S. ZIANI (Meldola, Forlì) and A. ZILLI (Rome) for loan of type material and supports. Our thanks are likewise extended to P. E. SKELLEY (Gainesville, Florida) for critical review of the manuscript.

REFERENCES

- ÁDÁM, L. (1994) A check-list of the Hungarian Scarabaeoidea with the description of ten new taxa. *Folia ent. hung.* **55**: 5–17.
- AUBÉ, C. (1850) Descriptions de quelques insectes coléoptères appartenant à l'Europe et à l'Algérie. *Annls Soc. Ent. France* **8**: 299–346.
- BÁGUENA, L. C. (1930) Las especies de Aphodiini de la provincia de Valencia. *Bol. Real Soc. Esp. Hist. Nat.* **30**: 313–322.
- BÁGUENA, L. C. (1959) Cuatro novedades y un comentario sobre coleópteros de España. *Eos* **35**: 210–214.
- BÁGUENA, L. C. (1960) Sobre Scarabaeidae de España y Marruecos. *Graellsia* **18**: 29–35.
- BÁGUENA, L. C. (1967) *Scarabaeoidea de la Fauna Ibero-balear y Pirenaica*. Consejo Superior de Investigaciones Científicas, Instituto español de entomología, Madrid, 576 pp.
- BALTHASAR, V. (1946) De novis generis Aphodius Ill. speciebus. *Acta ent. Mus. nat. Pragae* **24**: 53–68.
- BALTHASAR, V. (1964) *Monographie der Scarabaeidae und Aphodiidae der palaearktischen und orientalischen Region. Coleoptera: Lamellicornia. Band 3, Aphodiidae*. Verlag der Tschechoslowakischen Akademie der Wissenschaften, Praha, 652 pp.
- BALTHASAR, V. (1967) Neue Arten der Familie Aphodiidae. *Acta ent. Bohem.* **64**: 122–139.
- BARAUD, J. (1971) Révision des Aphodius paléarctiques du sous-genre Ammoecius Muls. *Bull. Soc. Ent. France* **76**: 63–71.
- BARAUD, J. (1980) Nouveaux Coléoptères Scarabaeoidea d'Afrique du Nord. *Nouvelle Rev. Entomol.* **10**: 279–284.
- BARAUD, J. (1981) Homonymies malencontreuses. *Rev. suisse Zool.* **88**: 135–136.
- BARAUD, J. (1985) *Coléoptères Scarabaeoidea. Faune du Nord de l'Afrique, du Maroc au Sinaï*. Lechevalier, Paris, 651 pp.
- BARAUD, J. (1992) *Coléoptères Scarabaeoidea d'Europe. Faune de France. France et régions limitrophes*, 78. Fédération française des Sociétés naturelles & Société Linnéenne, Paris & Lyon, 856 pp.
- BOHEMAN, C. H. (1857) *Insecta Caffrariae annis 1838–1845 a J. A. Wahlberg collecta amici auxilio sussultus descripsit. Coleoptera. 2*. Officina Norstedtiana, Holmiae, 395 pp.
- BORDAT, P. (1990) Aphodius nouveaux ou peu connus d'Afrique du Sud (3^e Note). *Nouvelle Rev. Entomol.* **7**: 307–316.

- BORDAT, P. (1999) Ammoecioides, nouveau genre et ses espèces. *Nouvelle Rev. Entomol.* **16**: 161–182.
- BRISOUT, C. (1866) Coléoptères nouveaux trouvées en Espagne pendant l'excursion de la Société en 1865. *Annls Soc. Ent. France* **4**: 355–426.
- CARPANETO, G. M. (1976) Una nuova specie di Aphodius (Ammoecius) dell'Anatolia. *Fragmenta entomol.* **12**: 241–251.
- CLÉMENT, P. (1975a) Diagnose préliminaire d'une nouvelle espèce d'Ammoecius d'Iran. *L'Entomologiste* **31**: 10–11.
- CLÉMENT, P. (1975b) Note complémentaire sur Ammoecius meurguesae Clément. *Bull. Soc. ent. France* **80**: 26–28.
- DELLACASA, G. (1983) Sistematica e nomenclatura degli Aphodiini italiani. *Monogr. Museo reg. Scienze nat. Torino* **1**: 1–464.
- DELLACASA, G. & DELLACASA, M. (1998) Pseudoahermodontus benesi: a new genus and new species of Aphodiini with large scutellum, and systematic redefinition of the genus-group *Ahermodontus* Báguena, 1930. *Boll. Mus. Reg. Sci. Nat. Torino* **15** [1997]: 407–416.
- DELLACASA, G., BORDAT, P. & DELLACASA, M. (2001) A revisional essay of world genus-group taxa of Aphodiinae. *Mem. Soc. Ent. italiana* **79** [2000]: 1–482.
- DELLACASA, M. (1988) Contribution to a world-wide catalogue of Aegialiidae, Aphodiidae, Aulonocnemidae, Termitrogidae. Pt. I. *Mem. Soc. Ent. italiana* **66** [1987]: 1–455.
- ENDRÓDI, S. (1964) Die Aphodiinae des Congo-Gebietes in Rahmen der Fauna von Zentral-Afrika. *Annls Mus. royal Afrique Centrale, in 8°*, *Zool.* **123**: 1–415.
- ENDRÓDI, S. (1978) Über südafrikanische Ammoecius-Arten der Gattung Aphodius Ill. *Annls hist.-nat. Mus. natn. hung.* **70**: 179–181.
- ENDRÓDI, S. (1980) Description of new Aphodiinae from South Africa. *Folia ent. hung.* **41**: 33–38.
- ENDRÓDI, S. & RAKOVIČ, M. (1981) Key to the species of South and South West Africa Aphodiinae. *Folia ent. hung.* **42**: 31–77.
- ERICHSON, W. F. (1848) *Naturgeschichte der Insecten Deutschlands. I. Coleoptera*. Nicolaischen B., Berlin **3**(5): 801–968.
- FABRICIUS, J. C. (1801) *Systema Eleutheratorum secundum ordines, genera, species, adjectis synonymis, locis, observationibus, descriptionibus. Tomo I*. Imp. Bibliopolti Academici Nov., Kiliae, 506 pp.
- GODART, A. (1852) Description d'une espèce nouvelle du genre Ammoecius. *Annls Soc. Linn. Lyon*, pp. 297–298.
- HAROLD, E. (1869) Diagnosen neuer Coprophagen. *Coleopt. Hefte* **5**: 95–104.
- HAROLD, E. (1871) Die Arten der Gattung Ammoecius. *Coleopt. Hefte* **7**: 1–20.
- ILLIGER, J. K. W. (1803) Verzeichniss der in Portugall einheimischen Käfer. Erste Lieferung. *Magazin für Insektenkunde, herausgegeben von Karl Illiger* **2**: 186–258.
- KOCHER, L. (1958) Catalogue commenté des Coléoptères du Maroc. 7. Lamellicornes. *Trav. l'Institut Chérifien* **16**: 1–83.
- LUIGIONI, P. (1929) I Coleotteri d'Italia. Catalogo sinonimico-topografico-bibliografico. *Memorie della pontificia Accademia delle Scienze – Nuovi Lincei* **13**: 1–1160.
- MULSANT, E. (1842) *Histoire naturelle des Coléoptères de France. Lamellicornes*. – Paris, Lyon, 623 pp.
- MULSANT, E. (1851) Description d'une espèce nouvelle du genre Ammoecius. *Opusc. ent.* **1**: 52–53.
- OLIVIER, A. G. (1789) *Entomologie, ou Histoire naturelle des Insectes, avec leur caractères génériques et spécifiques, leur description, leur synonymie, et leur figure enluminée. Coléoptères. T. I*. Baudouin, Paris, 190 pp.

- ORBIGNY, H. d' (1896) Synopsis des Aphodiens d'Europe et du Bassin de la Méditerranée. *L'Abeille* **28**: 197–271.
- PARDO ALCAIDE, A. (1936) Contribution à la connaissance de la faune entomologique marocaine. *Bull. Soc. Hist. Nat. Afrique du Nord* **27**: 392–393.
- PAULIAN, R. (1942) Coleoptera Scarabaeidae: Aphodiinae. Exploration du Parc National Albert. Mission G. F. de Witte (1933–1935). *Institut des Parcs nationaux du Congo Belge* **35**: 1–143.
- PAULIAN, R. & BARAUD, J. (1982) *Faune des Coléoptères de France. II. Lucanoidea et Scarabaeoidea. Encyclopédie Entomologique, XLIII*, Ed. Lechevalier, Paris, 477 pp.
- PÉRINGUEY, L. (1901) Descriptive Catalogue of the Coleoptera of South Africa (Lucanidae and Scarabaeidae). *Trans. South Africa Phylosophical Soc.* **12**: 1–563.
- PETROVITZ, R. (1961) Neue und verkannte Aphodiinae aus allen Erdteilen. II Teil. *Entomol. Arbeiten aus dem Museum Georg Frey* **12**: 344–356.
- PETROVITZ, R. (1962) Neue und interessante Scarabaeidae aus dem vorderen Orient. I Teil. *Reichenbachia* **1**: 107–124.
- PETROVITZ, R. (1964) Neue afrikanische und australische Aphodiidae. *Reichenbachia* **4**: 171–207.
- PETROVITZ, R. (1968) Scarabaeidae aus Marokko. *Bull. Soc. Sci. Nat. Physiq. Maroc* **47**: 227–235.
- PETROVITZ, R. (1980) Österreichische entomologische Expeditionen nach Persien und Afghanistan. Beiträge zur Coleopterenfauna. Teil XII. Weiteres über Lamellicornia aus Iran. *Ann. Naturhist. Hofmuseum* **83**: 597–638.
- PEYERIMHOFF, P. (1939) Études et descriptions de Coléoptères marocains. II. *Bull. Soc. Sci. Nat. Physiq. Maroc* **19**: 248–308.
- REICHE, L. (1852) [Synonymies]. *Bull. Soc. Ent. France* **10** (2^e sér.): LVIII–LIX.
- REITTER, E. (1892) Bestimmungs-Tabelle der Lucaniden und coprophagen Lamellicornen des palae-arktischen Faunengebietes. *Verhandl. Naturfor. Vereins* **30**: 140–262.
- REITTER, E. (1904) Sechs neue Coleopteren aus der palaerktischen Region. *Wiener Ent. Zeitung* **33**: 255–258.
- SCHATZMAYR, A. (1946) Gli Scarabeidi coprofagi della Libia e dell'Egitto. *Atti Soc. italiana Sci. nat.* **85**: 40–84.
- SCHMIDT, A. (1908) *Ammoecius dentatus* n. sp. *Dtsch ent. Zeitschrift*: 504.
- SCHMIDT, A. (1913) Erster Versuch einer Einteilung de exotischen Aphodien in Subgenera und als Anhang einige Neubeschreibungen. *Archiv Naturges., Abt. A* **79**: 117–178.
- SCHMIDT, A. (1922) *Coleoptera Aphodiinae. (Das Tierreich)*. 45. W. de Gruyter, Berlin & Leipzig, 614 pp.
- SEABRA, A. F. (1909) *VI. Esboço monographico sobre os Scarabaeidos de Portugal (Aphodiini e Hybosorini). Estudos sobre os animaes uteis e nocivos á agricultura*. Direcção geral da Agricultura. Publicações do Laboratorio de Pathologia vegetal, Lisboa, 126 pp.
- VEIGA, C. M. (1998) *Los Aphodiinae ibéricos*. Tesis doctoral. Universidad Complutense, Facultad de Ciencias Biológicas, Departamento De Biología Animal I, Madrid, 573 pp.
- VŠETEČKA, K. (1939) *Aphodius (Ammoecius) bischoffi* n. sp. *Čas. Českoslov. Spol. Ent.* **36**: 31.

Received July 8, 2002, accepted December 9, 2002, published February 28, 2003