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REMARKS ON SOME NEAR EASTERN *EUONTHOPHAGUS* SPECIES WITH THE DESCRIPTION OF TWO NEW SPECIES FROM IRAN

(Insecta Coleoptera Scarabaeidae: Onthophagini)

Abstract

Two new Iranian species of *Euonthophagus* Balthasar, 1959, are described and figured. These include: *E. yama* n.sp. and *E. verberatus* n.sp. Diagnostic features and drawings of *E. pertinax* (Balthasar, 1959), closely related to *E. yama* n.sp., are given. A taxonomic redefinition and a key to subspecific taxa of the polytypic species *Euonthophagus amyntas* (Olivier, 1789) are supplied, as well as a key to *Euonthophagus* species occurring in Iran.

چکیده : دو گونه جدید جنس ***Euonthophagus*** **Balthasar1959** از ایران توصیف و ترسیم شدند که شامل گونه های ***E. yama*** **n.sp.** و ***E. verberatus*** **n.sp.** می باشند. خصوصیات تشخیصی و ترسیمی گونه ***E. pertinax*** **(Balthasar, 1959)** بسیار نزدیک به یکی از گونه هایی است که جدیدا توصیف شده است. توصیف تاکسونومیکی و کلید شناسایی برای زیر گونه های ***Euonthophagus amyntas*** **(Olivier, 1758)** و همچنین کلیدی نیز برای گونه های جنس ***Euonthophagus*** ایران تهیه گردید.

Riassunto

[*Note su qualche* Euonthophagus *del Vicino Oriente con la descrizione di due nuove specie dell'Iran*]
Vengono descritte due nuove specie iraniane appartenenti al genere *Euonthophagus* Balthasar, 1959, *E. yama* n.sp. e *E. verberatus* n.sp., e vengono forniti ri-descrizione e disegni di *E. pertinax* (Balthasar, 1959), considerato vicino ad *E. yama* n.sp.. Sono inoltre proposte una ridefinizione tassonomica ed una chiave per la determinazione dei taxa sottospecifici attribuiti alla specie politipica *Euonthophagus amyntas* (Olivier, 1789), così come una chiave per la determinazione delle specie di *Euonthophagus* presenti in Iran.

Key-words: Coleoptera, Scarabaeidae, *Euonthophagus*, taxonomy, systematics, new species, new synonymies, Iran, Palearctic Region.

Introduction

The finding of four Iranian *Euonthophagus* specimens that have to be assigned to a yet undescribed species gave me the opportunity to study some species of the genus occurring in Iran, to propose a taxonomic redefinition of the polytypic species *Euonthophagus amyntas* (Olivier, 1789) and to provide a key to the Iranian *Euonthophagus* species. Within the material that colleagues and public institutions gave me to study, I found three further specimens that without any doubt belong to another undescribed species of the same genus.
How it is possible that in a few months time I have come across two new species, both belonging to a very much studied and well known genus such as *Euonthophagus*, and both from Iran, it is beyond any theory of mine and probably fall within those inexplicable, fortunate chances that Entomology sometimes offers us.

Methods

Specimens body width is measured where body is widest, usually from side to side of elytra. Copulatory spicules are drawn with the membrane to which the spicule is attached always down. I refer to Ziani & Gudenzi (2006) for other methods and terminological conventions.
The study of female genitalia did not prove essential, not even necessary for discriminating between the concerned *Euonthophagus* species. In general terms, however, notwithstanding the work of some recent authors, a study of the variability of the female genitalia within and amongst populations of any species of Onthophagini is still lacking.

Abbreviations of collections.

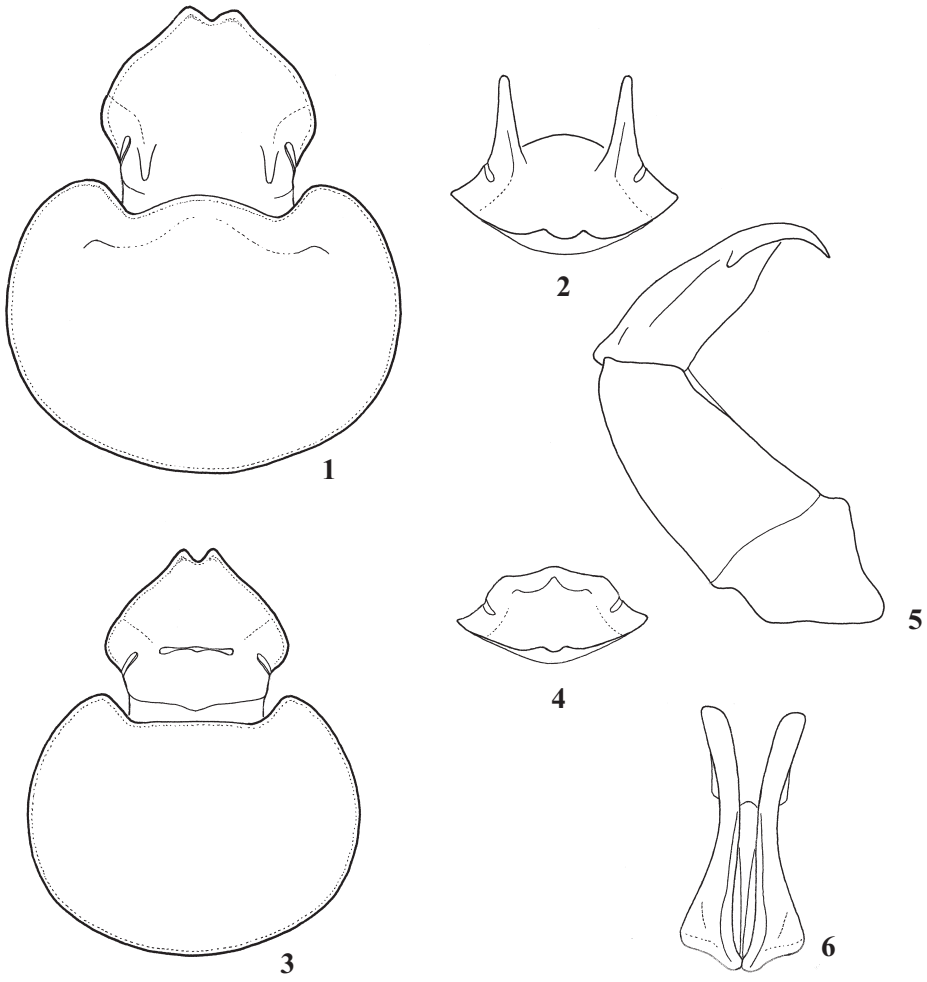
GDCG	G. & M. Dellacasa private collection, Genoa (Italy)
LNCB	L. Nádai private collection, Budapest (Hungary)
HNHM	Termeszettudományi Muzeum Allattára, Budapest (Hungary)
MHNG	Muséum d'Histoire Naturelle, Geneva (Switzerland)
NHMB	Naturhistorisches Museum, Basel (Switzerland)
NMPC	Národní Muzeum v Praze, Prague (Czech Republic)
NMW	Naturhistorisches Museum, Wien (Austria)
SZCM	S. Ziani private collection, Meldola, Forlì (Italy)

Euonthophagus pertinax (Balthasar, 1959) **n. comb.**
Onthophagus (*Euonthophagus*) *pertinax* Balthasar, 1959: 467; Balthasar, 1960: 187; Balthasar, 1963: 475; Zunino, 1972: 15; Kabakov, 1977: 392

Type locality. "Bashgultal im Nuristan, Kamu" [Bashgul valley, Afghanistan].
Type material. Holotype female, fixed by original designation, and paratype female at NMPC.
Type labelling. 1st, white, printed in black: "J. Klapperich / Bashgultal 1500 m / Kamu, Nuristan / 26.4.53, Afgh."; 2nd, pink, handwritten and printed in black: "Onthophagus / (Euonthoph.) / pertinax ♀ / n.sp. Balth. / Holotypus"; 3rd, white, handwritten in blue and printed in black: "Vidit / Zunino 1971".
Diagnostic features. Length 8.5 to 9.5 mm, width 4.5 to 5.1 mm[1]. Pronotum as long as elytra or little shorter (length ratio 0.96 to 1.03). Black, upper side moderately shining, with a distinct microreticulation, pubescence from dark yellow to brown, antennal articles red to dark red, antennal club brown to black.
Head (figs 1-4) very slightly wider than long (width/length ratio 1.31 to 1.47), anterior margin of clypeus reflexed and prolonged forward, medially excised, the excision flanked by a pair of teeth, round in males, sub-dentate in females, sides not sinuate in front of genae, which are protruding; clypeo-frontal and occipital carinae absent in males, clypeo-fontal carina raised in three points, the median one more elevate, in females; frons with a pair of erect subparallel, very slightly incurved posteriorly, slender tapering horns in males, arise between eyes, very close to them, the horns not joined by a transverse carina, separated by about their length or little less; space between horns clearly depressed; clypeus and epistome with very close, rather coarse, rugose punctures, frons only with sparse, simple, almost indistinct punctures; genae with long dark yellow hairs.
Pronotum (figs 1, 3) strongly convex, declivous towards anterior edge in males, less so in females, with distinct anterolateral tubercle on either side and with an anteromedian not prominent fold in males, entirely unarmed in females; anterolateral angles largely round, sides not sinuate; dorsal surface irregularly, shallowly punctate, punctures differently sized, sub-rugose on sides; pronotum surface with very short, wide, yellow pubescence, almost indistinguishable on disc.
Elytral striae shining and very shallow, their punctures very slightly crenating interstriae; the latter flat, granulose, granules minute, very sparse, as large as strial punctures, each of them with a very short fine whitish yellow almost indistinguishable hair.
Pygidium setigerously punctate, punctures widely and irregularly spaced, each of them with a yellow fine hair longer than elytral and pronotal ones.
Metasternal plate flat, smooth, shining, at sides with setigerous punctures in males and females.
Fore tibial spur stout, acuminate apically, slightly longer than the first two tarsal

[1] All examined specimens of *Euonthophagus pertinax* (Balthasar, 1959) and *E. yama* n. sp. have pronotum slightly but constantly wider than elytra. For that reason body width of the two species is measured from side to side of pronotum where it is widest.

segments, bent downwards, barely inwards in males, thinner and bent downward in females, almost as long as the first three tarsal segments. Fore, middle and hind tibiae ventrally with very sparse punctures, each of them with long fine yellow hairs. Fore tibiae inferior carina apically with a tuft of long red hairs in males.
Male genital armature. Parameres: figs 5, 6. Aedeagus internal sac with one smooth, thin and lengthened copulatory spicule (fig. 13), tricuspidate at one extremity.



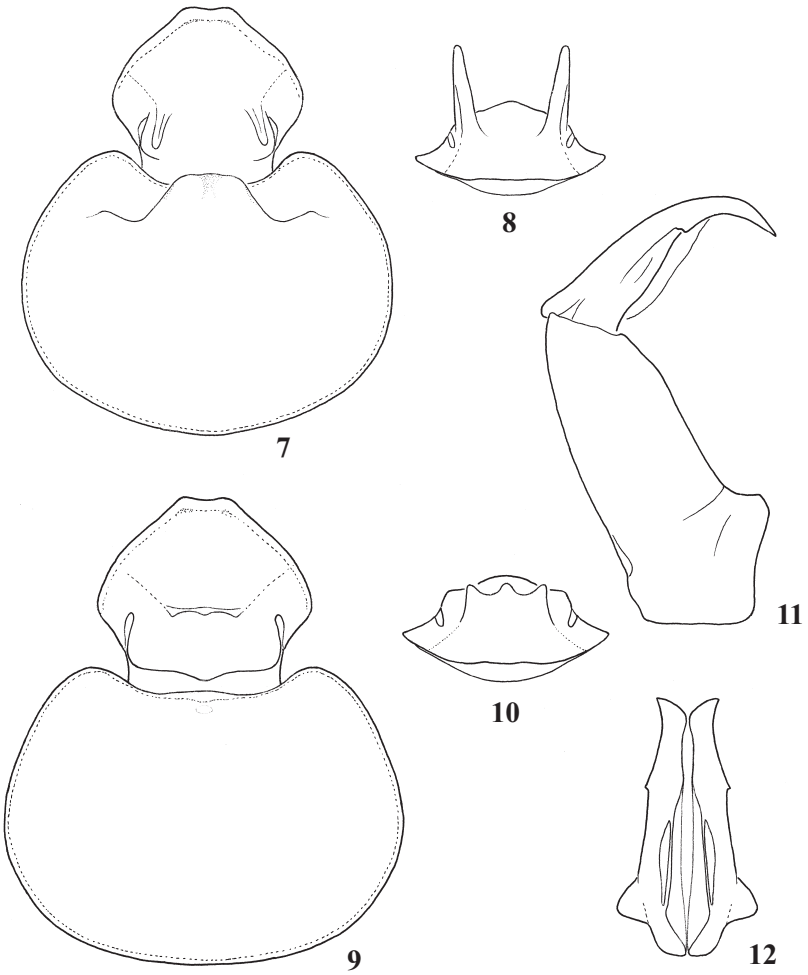
Figs 1-6. *Euonthophagus pertinax* Balthasar, 1960. Male [Afghanistan, Kābul]; female, holotype [Afghanistan, Bashgul valley]. 1-male: head and pronotum, dorsal view; 2–male: head, frontal view; 3–female: head and pronotum, dorsal view; 4-female: head, frontal view; 5-parameres, lateral view; 6–parameres, dorsal view. Drawings by I. Gudenzi.

Distribution. Afghanistan (BALTHASAR, 1960). Pakistan (KABAKOV, 1977). Herein recorded from Iran for the first time.
Material examined. 6 specimens other than the holotype, as follows. **AFGHANISTAN**: "Afgh. 26.4.53. / Basghultal / Nurestan / 1500 m." 1 specimen ♀ (paratype, Balthasar collection, NMPC); "Umg. Kabul / Afghanistan", 2 specimens ♂♂ and 2 specimens ♀♀, determined by Balthasar (Petrovitz collection, MHNG); **IRAN**: Fārs prov., Zāgros mts., 25 km W Shirāz, 26-27.IV.1999, J. Kalāb leg. 1 specimen ♀ (SZCM).
Biology. KABAKOV (1977) reported that the species was collected in a carcase of tortoise and in decayed fungi. If confirmed, this would be the first case of necro-saprophagy in the genus *Euonthophagus*, until now known to be strictly coprophagous.
Remarks. BALTHASAR (1959) quoted *O. pertinax* Balthasar as the only species of *Euonthophagus* with clypeus strongly emarginate anteriorly and dentate at sides. Actually the complete Balthasar's description of *O. pertinax* was published only one year later, in 1960, but according to Article 13.1.1 of the International Code of Zoological Nomenclature, 4th edition, the name, being accompanied by a definition that states a character to differentiate the taxon, is available from BALTHASAR (1959).
Contrary to what KABAKOV (1977) stated, the description of the male of *O. pertinax* was neither published by PETROVITZ (1961a) nor in any other Petrovitz's work, but by BALTHASAR (1963: 476, footnote).

Euonthophagus yama n.sp.

Type locality. Iran, near Morad Abad, Kordestān prov.
Type series. Holotype ♂: Iran, near Morad Abad, Kordestān prov., 1000 m, 29.IV.2001, leg. G. Fábián & K. Vig. Allotype ♀ and 2 paratypes ♂♂: same data as holotype.
Type depositary. Holotype in HNHM. Allotype and 1 paratype in LNCB. 1 paratype in SZCM.
Type labelling. 1st, white, printed in black: "IRAN, Prov. Kordestan / near Marad-Abad / 1000 m, 29.IV.2001 / leg. Gy. Fábián & K. Vig"; 2nd, red, printed in black: "Holotype / *Euonthophagus* / *yama mihi* / S. Ziani, 2006".
Etymology. The name, noun in apposition, is from Persian mythology. Yama, human hero, was entrusted by the supreme god Ahura Mazda with the task to assemble specimens of all living creatures in an underground shelter to preserve them from the deluge with which the god himself was going to destroy the whole mankind.
Description. Holotype. Length 9.6 mm, width 5.1 mm; pronotum approximately as long as elytra (length ratio = 1.09). Black, moderately shining, with a distint microreticulation, pubescence from whitish yellow to dark red or black, pedicel and funicle dark red, antennal club black.

Head (figs 7, 8) slightly wider than long (width/length ratio = 1.42), anterior margin of clypeus reflexed and prolonged into a truncate, slightly emarginate process, anterior angles round, sides not sinuate in front of genae, which are protruding; clypeo-frontal and occipital carinae absent; clypeo-genal sutures prolonged in a pair of long, subparallel and slightly incurved posteriorly, slender tapering horns, not joined at base, separated by about their length or little less;



Figs 7-12. *Euonthophagus yama* n.sp.. Male, holotype, and female, allotype [Iran, Kordestān prov., near Morad Abad]. 7-male: head and pronotum, dorsal view; 8-male: head, frontal view; 9–female: head and pronotum, dorsal view; 10-female: head, frontal view; 11-parameres, lateral view; 12–parameres, dorsal view. Drawings by I. Gudenzi.

frons clearly depressed; clypeus and epistome with very close, rather coarse, rugose punctures, frons only with sparse, simple, almost indistinct punctures; genae with long dark red hairs.
Pronotum (fig. 8) strongly convex, declivous towards anterior edge, with distinct anterolateral tubercle on either side and with an anteromedian barely bilobate prominence, more protruding towards head than the two lateral ones; anterolateral angles largely round, sides not sinuate; anterior margin bordered, base bordered at middle, edge shortly interrupted laterally; dorsal surface irregularly, shallowly punctate, punctures differently sized, sub-rugose on sides; pronotum surface with very short, wide, whitish yellow pubescence, almost undistinguishable; propleura with long, dark red hairs, clearly distinguishable from upper side.
Elytral striae shining and very shallow, their punctures slightly crenating interstriae; the latter flat, granulose, granules minute, very sparse, smaller than strial punctures, each of them with a very short fine whitish yellow almost undistinguishable hair.
Pygidium setigerously punctate, punctures widely and irregularly spaced, each of them with a yellow fine hair longer than elytral and pronotal ones.
Metasternal plate with a concave deep hollow, slightly lengthened, smooth, shiny, with no puncture or pubescence, double punctate at sides, bigger punctures subrugose, each of them with a long yellowish white hair.
Fore tibial spur stout, acuminate apically, slightly longer than the first two tarsal segments, bent downwards, barely inwards. Fore, middle and hind tibiae ventrally with very sparse punctures, each of them with long fine dark red hairs. Fore tibiae inferior carina apically with a tuft of long red hairs.
Allotype. Length 10.4 mm, width 5.5 mm; pronotum approximately as long as elytra (length ratio = 1.08).
Head (figs 9, 10) slightly wider than long (width/length ratio = 1.50); occipital carina absent, clypeo-genal sutures prolonged in a carina raised into three points; head surface entirely transversely rugose, with sparse, long, erect yellow hairs.
Pronotum (fig. 9) less convex than male's one, entirely unarmed and not carinate, its anterior declivity flat, not sharply set off, only with an anteromedian unpunctate point; pronotal punctation more impressed and dense than in male.
Metasternal hollow not so deep as in male, more lengthened.
Fore tibia spur thinner than male's spur, almost as long as the first three tarsal segments.
Variability. The only meaningful difference found in the other two males of the typical series is the length, 8.8 mm in one specimen, 9.2 in the other.
Male genital armature. Parameres: figs 11, 12. Aedeagus internal sac with one smooth and lengthened copulatory spicule (fig. 15), sharp and acuminate at one extremity, wide and sub-truncate at the other.
Distribution. Known only from the type locality.
Other examined specimens. I have examined a very worn gynaecoid minor male (**Iran**-Fārs prov., env. Shīrāz, 20.VI.1963, L. H. Herman leg. (GDCG))

that, for the shape of paramera apex and copulatory spicule, I assign, even if doubtfully, to *E. yama* n.sp. On the other hand its femalelike form and the bad condition of some external morphological characters don't allow me to put it inside the typical series of the new species.

Discussion. The new species, lacking both clypeal and occipital carinae in male, cannot be confused with any other species but *E. pertinax* (Balthasar, 1959). As reported above, I have examined the holotype and the only paratype of *E. pertinax* (NMPC) as well as four specimens conserved in Petrovitz collection (MHNG), two of them seen and determined by Balthasar himself. The male of *E. yama* n.sp. can be distinguished from the male of *E. pertinax* for

- medially less strongly produced clypeal margin (head width/length ratio from 1.42 to 1.50), barely emarginate anteriorly / clypeal margin clearly produced (head width/length ratio from 1.31 to 1.33), distinctly bilobate in *E. pertinax*
- horns placed about at middle of head's length / horns placed in the posterior half in *E. pertinax*
- clearly produced pronotal anteromedian prominence / pronotal anteromedian prominence almost mutic in *E. pertinax*
- deeply concave metasternal plate / metasternal plate flat, almost convex in *E. pertinax*.

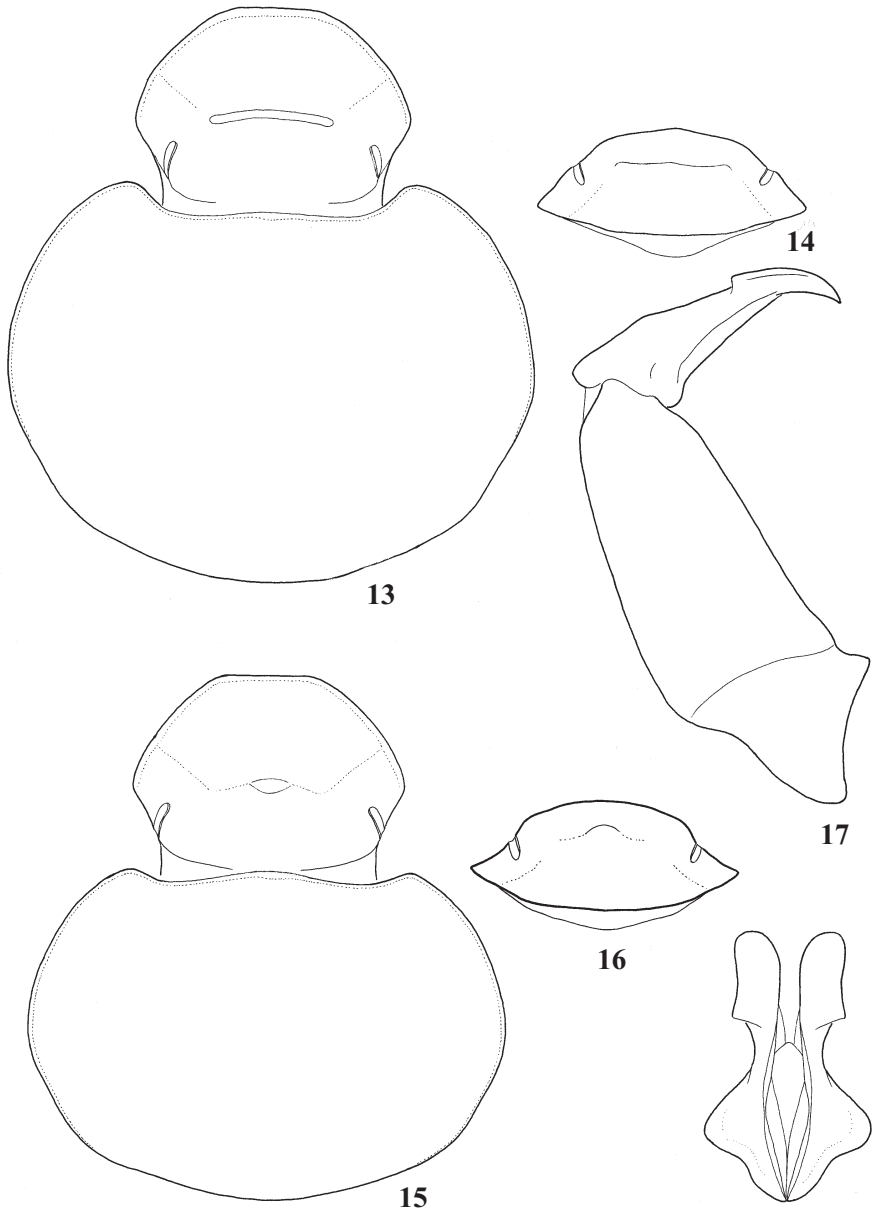
Furthermore, apex of parameres are sharp in the new species, round in Balthasar's species.

The female of *E. yama* can be distinguished by the clypeal margin, slightly emarginate – bilobate, almost sub-dentate in *E. pertinax* – and by pronotal punctation, more spaced in *E. pertinax*.

During the study I also examined a single *Euonthophagus* specimen (**Iran**: Fārs prov., 3 km W Sangar, 2000 m, 18.IV.1999, L. Nádai leg. (LNCB)) that shows some characters related now to *E. yama*, now to *E. pertinax*, now to a new species. It is a minor male, without pronotal prominences or tubercles. The clypeal margin is produced, emarginate anteriorly. Cephalic horns are reduced but clearly appreciable, long about one third of the distance between them, placed in the posterior half of the head, but joined by a carina. On the other hand the metasternal hollow is deeply concave, lengthened, and apex of parameres is similar to *E. yama*'s. The copulatory spicule (fig. 21) is, in the end, very characteristic, slender and acuminate at one extremity, with a tooth laterally at one side, wide at the other extremity. I am not able, at the moment, to assign this specimen to any known species, but before describing it as new it is preferable to wait for the examination of more specimens of both sexes, or a major male at least.

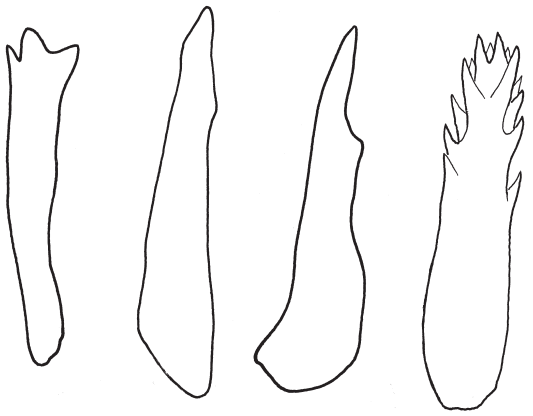
Euonthophagus verberatus n.sp.

Type locality. Iran, Qomsheh, Eşfahān prov.
Type series. Holotype ♂: Iran, Qomsheh, Eşfahān prov., 17/19.IV.2001, leg. S. Mersin. Allotype ♀ and 1 paratype ♂: same data as holotype.
Type depositary. Holotype and allotype in GDCG. Paratype in SZCM.
Type labelling. 1st, white, printed in black: "IRAN, Isfahan Prov. / Qomsheh / 17/19.IV.2001 / S. Mersin leg."; 2nd, green, printed in black: "Dellacasa / Collection / Genoa"; 3rd, red, printed in black: "Holotype / *Euonthophagus* / *verberatus mihi* / S. Ziani, 2006".
Etymology. From the Latin "*verberatus*", struk with a rod, a whip, with reference to the particular structure of elytral surface.
Description. Holotype (fig. 55). Length 11.7 mm, width 6.4 mm; pronotum as long as elytra (length ratio = 1.00). Black, moderately shining, pubescence from dark yellow to dark red or black, pedicel and funicle dark red, antennal club black.
Head (figs 13, 14) very slightly wider than long (width/length ratio = 1.52), anterior margin of clypeus evenly round, reflexed, anterior angles round, genae protruding; clypeo-frontal carina distinct, backwards bent, its edge not reaching clypeo-genal suture; frons slightly depressed; clypeus and epistome with very close, rather coarse, rugose punctures, frons with sparse punctures; genae as well as clypeal surface with few long dark red hairs.
Pronotum (fig. 13) convex, declivous towards anterior edge, completely unarmed and not carinate; anterolateral angles largely round, sides not sinuate; anterior margin bordered, base bordered at middle, edge shortly interrupted laterally; dorsal surface irregularly, strongly punctate, punctures differently sized, the larger ones clearly umbilicate; surface between punctures with a hardy appreciable microreticulation; pronotum surface with very short, wide, whitish yellow pubescence, almost undistinguishable; propleura with long, dark red hairs, clearly distinguishable from upper side.
Elytral striae very shallow, their punctures very slightly crenating interstriae; the latter dull owing to strong granulose microreticulation, with few, very sparse, minute granules, shiny, smaller than strial punctures, and with irregular, smooth, shiny lobes, superficially swelled in knots, knobs or protuberances; interstrial granules with a very short fine yellow almost undistinguishable hair.
Pygidium setigerously punctate, punctures widely and irregularly spaced, each of them with a dark red fine hair longer than elytral and pronotal ones.
Metasternal plate with a lengthened furrow, hollowed posteriorly, smooth, shiny, with no puncture or pubescence, strongly punctate at sides, punctures sub-rugose, each of them with a long red yellowish hair.
Fore tibial spur stout, acuminate apically, slightly shorter than the first two tarsal segments, barely bent inwards. Fore, middle and hind tibiae ventrally with very sparse punctures, each of them with long fine dark red hairs. Fore tibiae inferior carina apically with a tuft of long dark red hairs.



Figs 13-18. *Euonthophagus verberatus* n.sp.. Male, holotype, and female, allotype [Iran, Eşfahān prov., Qomsheh]. 13-male: head and pronotum, dorsal view; 14-male: head, frontal view; 15-female: head and pronotum, dorsal view; 16-female: head, frontal view; 17-parameres, lateral view; 18-parameres, dorsal view. Drawings by I. Gudenzi.

Allotype. Length 11.2 mm, width 6.0 mm; pronotum slightly shorter than elytra (length ratio = 0.90).
Head (figs 15, 16) slightly wider than long (width/length ratio = 1.57), anterior margin of clypeus very slightly emarginate; clypeo-genal sutures prolonged in a short carina raised at middle, its edge reaching clypeo-genal suture; clypeal surface entirely transversely rugose, with sparse, differently sized, yellowish red hairs; frons with barely impressed punctures, differently sized, the larger ones umbilicate.
Pronotum (fig. 15) with punctures more impressed and denser than in males; all pronotal surface with distinct microreticulation, more obvious inside the large punctures.
Metasternal plate with a lengthened furrow, slightly hollowed posteriorly, almost hairless and sparsely punctate at sides.
Fore tibia spur slender, thinner than male's, almost as long as the first three tarsal segments.
Variability. Paratype differs in size (11.1 mm), width (5.9 mm), and having the anterior margin of clypeus very slightly emarginate.
Male genital armature. Parameres: figs 17, 18. Aedeagus internal sac with one copulatory spicule (fig. 22), slender, armed with numerous short prickles for a good half of its length.
Distribution. Known from the type locality only.
Discussion. For the shape of elytral interstriae surface, greatly remarkable in the genus and very similar to the one of the ball/rolling dunbg beetle *Gymnopleurus*



Figs 19-22. Copulatory spicules. 19-*Euonthophagus pertinax* (Balthasar, 1959) [Afghanistan, Kābul]; 20-*Euonthophagus yama* n.sp. [Iran, Kordestān prov., near Morad Abad]; 21-*Euonthophagus* sp. [Iran: Fārs prov., 3 km W Sangar]; 22-*Euonthophagus verberatus* n.sp. [Iran, Eşfahān prov., Qomsheh]. Drawings by the author and I. Gudenzi.

flagellatus (Fabricius, 1787), *E. verberatus* n.sp. is readily distinguishable at first sight from any other *Euonthophagus* species.

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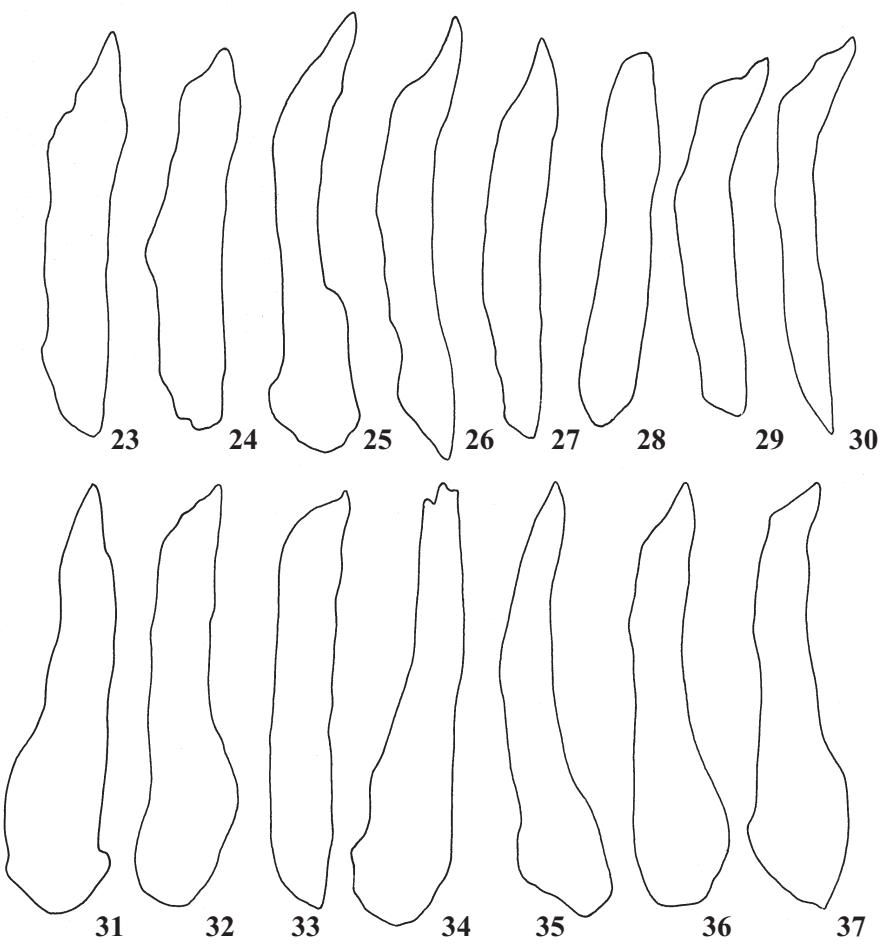
In the literature there is a great deal of confusion and uncertainty concerning the actual taxonomic value of *Euonthophagus amyntas* and all its related popula-



Figs 23-37. *Euonthophagus amyntas* (Olivier, 1789) s.l.. Copulatory spicules. 23-Portugal, Ribatejo prov., Glória du Ribatejo; 24-Portugal, Trás-os-Montes prov., Paradela; 25-Portugal, Estremadura prov., Cruz-Quebrada; 26-Spain, Ávila distr., El Barraco; 27-Spain, Segovia distr., Sierra de Guadarrama; 28-Spain; 29-France, Corse isl., Macinaggio; 30-Italy, Potenza prov., Carbone; 31-Hungary, Balaton; 32-Bulgaria, Malko Turnovo; 33-Greece, environs Grevena; 34-Greece, Tríkala distr., Kalambá; 35-Greece, Peloponnesus, Hania; 36-Greece, Crete isl., Prasses; 37-Turkey, Antalya distr., Imrasan geçidi. Drawings by the author and I. Gudenzi.

tions[2], regarded now simply synonyms, now as aberrations, now subspecies, now distinct species. Systematic and nomenclatorial history of the taxon follows.
Euonthophagus amyntas (Olivier, 1789) was described, as *Scarabaeus amyntas*, on some male specimens from Southern France. In the same work and from the same locality, OLIVIER described, sixteen pages after, a *Scarabaeus tages* that is (REICHE, 1856; REICHE & SAULCY, 1856) nothing else but the female of *Scarabaeus amyntas*.
In 1792 FABRICIUS described (pg. 56) *Scarabaeus alces* on male specimens from Hungary. Five pages after, and always from Hungary, he described its female as *Scarabaeus hybneri* (and not "*hübneri*", sometimes emended in "*huebneri*", as reported in most literature). REICHE (1856) synomyzed *hybneri* with *amyntas*.
Later, *Onthophagus subviolaceus* was described by MÉNÉTRIES (1832) from Baku (Azerbaijan), as well as *Onthophagus auchenia* by REDTENBACHER (1850) from South Iran: the former was synonymyzed with *O. amyntas* by KOLENATI (1846), while the latter, firstly synonymyzed with *O. amyntas* by REITTER (1891), has always been regarded as its junior synonym, but with a question mark, by most authors who dealt with it.
Five "varieties" of *Onthophagus tages* Olivier were described by MULSANT (1842) from France: *difformis* and *dubius* on males, *unituberculatus*, *sycophanta* and *umbrinus* on females. Anyway, according to Mulsant, male fore tibial spur of *O. tages* is "dilaté de la base à l'extrémité, et obliquement tronqué à celle-ci". Therefore, as already stated by BEDEL (1908), *Onthophagus tages* sensu Mulsant, 1842 (as well as, for the same reason, *Onthophagus amyntas* sensu Mulsant & Rey, 1871) is the present *Euonthophagus gibbosus* (Scriba, 1790) and all Mulsant's varieties are to be assigned to this species.
In 1907 SEABRA described *Onthophagus amyntas* var. *nigrovirescens*, from Portugal, regarded as simple aberration by all subsequent authors, and deemed all Mulsant's varieties as varieties of *Onthophagus amyntas*.
At the end, a subspecies of *amyntas*, ssp. *aspadanaensis* Petrovitz, 1965, was described from Central Iran, but its validity was doubted and denied by some authors, such as ZUNINO (1972) and MARTÍN-PIERA (2000), on the basis of the study of genital armatures.
KRAJCIK (2006), inside the synonyms list of *Euonthophagus amyntas*, includes, even if with a question mark, the taxon *consors* quoted by BAUDI (1870) as

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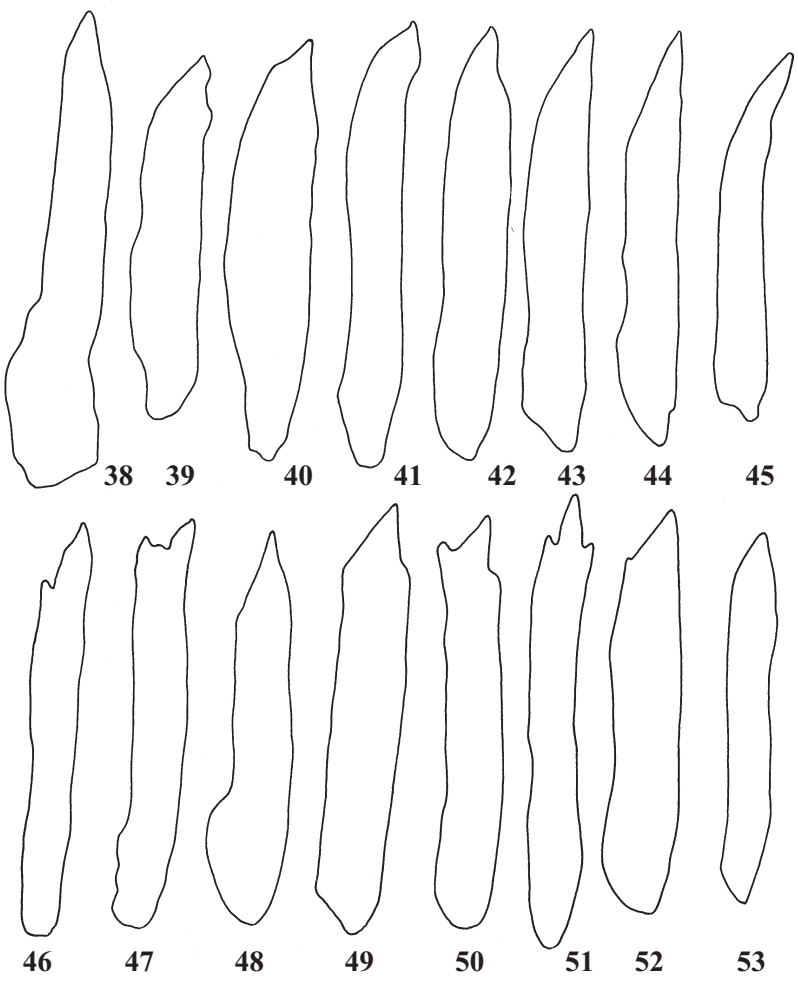
[2] *Onthophagus piffli* was described by PETROVITZ (1961b) from "Saidu Sharif" (Northern Pakistan) and compared with the supposed related species *O. amyntas*. BALTHASAR (1963) inserted, with a question mark, the species in *Onthophagus* s. str. and asserted that "die Form der Vorderschienen des ♂ erinnert sehr an die Arten der UG. *Euonthophagus*, mit denen die sonst aber nichts gemeinsames hat". SCHEUERN (1995) doubtfully arranged the species in the subgenus *Colobonthophagus* Balthasar, 1935. The examination of the type series (9 syntypes, 3 males and 6 females, MHNG) allowed me to agree with Scheuern and to leave *piffli* out of the genus *Euonthophagus* definitively.

"variety" of *Onthophagus tages*. BAUDI (l. c.) explicitly referred to a *nomen nudum* by REICHE (1856) (who, in his turn, had quoted another *nomen nudum* by Friwaldski) but did not specify the type locality of the variety. Subsequently, in 1891, BAUDI himself defined that the specimens of "*Onthophagus amyntas* var. *consors* Reiche" of his collection were collected in Cyprus island, and Cyprus



Figs 38-53. *Euonthophagus amyntas* (Olivier, 1789) s.l.. Copulatory spicules. 38-Turkey, Ağri distr., Tutek; 39-Turkey, Van distr., Kocapınar; 40-Israel, Upper Galilee, Kfir Meron; 41-Syria, 30 km NW Dara; 42-Iran, Zanjān prov., Kuh-e Sendan/Zacker; 43-Iran, Lorestān, Kuh-e Oshturan; 44-Iran, Gılān prov., Masulè/Mt. Tales; 45-Iran, Fārs prov., Dasht-arjan; 46/47/48-Armenia, Kotayk distr., Egbvard-Arailer; 49-Iran, Khorāsān prov., Bojnūrd; 50-Kyrgyzstan, Bishkek; 51-Turkmenistan, Kushka; 52-Tagikistan, Tavildara; 53-Turkmenistan, Kushka. Drawings by the author and I. Gudenzi.

is the type locality reported also by KRAJCIK (l. c.). I have not been able to examine *consors*'s type but firstly from BAUDI's 1870 description ("*mas insuper distinctus tibiarum anticarum calcare brevi, apicem versus fortius dilatato, apice oblique truncato, securiforme*") in which the author states that males of *consors* are distinct by tibial fore spur short, strongly dilatated towards apex, the latter oblique truncate, axe-form, and secondly because *Euonthophagus amyntas* has never been quoted from Cyprus (ZIANI, 1997), the record and the pertinent synonymy have to be assigned to one of the two *Euonthophagus* species quoted from the island, i.e. *E. gibbosus* (Scriba, 1790) or, most probably, *E. atramentarius* (Ménétries, 1832).

According to ZUNINO (1972) in the genus *Euonthophagus* the most useful taxonomic character present in the internal sac is the copulatory spicule, which would have a strong specific value. Regarding *E. amyntas* and all its geographic populations, ZUNINO (l.c.) has asserted that, on the basis of the study of a great number of specimens from all distributional area, genital armatures do not show meaningful differences, on the contrary the species seems to be very homogeneous. This assertion is unmatched with my checking, so I disagree with it. Copulatory spicules (figs 23-53) have a quite uniform morphology only in Western populations while, on the other hand, show some different shapes in the Central-Eastern populations. Sometimes such differences are easily remarkable also amongst specimens collected in the same locality (figs 46-48).
Now, it is well-known that genital armatures, whose function are merely reproductive, are entirely internal structures that should be subject to necessarily linear evolutionary pressures, not strictly dependant on environmental constraints, but chiefly controlled by mechanism related to the mating system. Nevertheless, under a theoretical point of view, the pieces of internal sac could be subjects of variation, as well as many other parts of the body.
Even if it is currently admitted that in Ontophagini the parameres and mostly the sclerites of the internal sac, be they the lamellae or the copulatory spicula, are species-specific and fairly constant as a rule inside each species, some intraspecific variability of the internal sclerites, the copulatory spicule in this case, when not connected with external morphological or geographical variations, does not necessarily represent a taxonomic character of specific value.
The study of a large number of *amyntas* specimens, across the known range of distribution of the species, has shown that the copulatory spicule varies greatly in its details, although always around the same very general shape. A similar study on the variability of copulatory spicules of other species of *Euonthophagus* remains, of course, to be done.
In Onthophagini literature there is at least another case in which the sclerites of internal sac show an intraspecific variability. I am referring to BRANCO (1992) who supplies drawings of the variability of the copulatory lamellae of *Pinacotarsus dohrni* Harold, 1875 and comes to the conclusion that the very large

distributional area of the species can explain some grade of variability even in the morphology of male genital internal armature. I agree with this assumption: to describe new species solely on the basis of a difference in the shape of male genital armature is not only senseless but also hazardous, since this difference, as observed in *Euonthophagus amyntas*, could lie within the range of variations of the species.
Euonthophagus amyntas sensu lato is a widespread species (fig. 54), represented by a large number of populations that differ slightly or more or less markedly from each other. The study of numerous specimens from almost all its distributional area allows me to say that it seems correct to group these populations in four taxonomic complexes. The examination of major male's external morphology lets easily understand in which area the specimen was collected. On the contrary the study of paramera apex and copulatory spicule is not of any help: the former is very constant in all the specimens while on the contrary the latter, as said above, does not have a constant shape, particularly in eastern populations.
Now, which rank is more useful to give to the four assemblages? After all these considerations, and keeping likewise in mind the existing barriers to the dispersal of populations, I have subjectively decided to deem them as subspecies. Three taxa of subspecific rank, besides the nominotypical one, are therefore recognized herein.

Key to the subspecies of ***Euonthophagus amyntas*** s.l.

1. Elytral interstriae more or less regularly convex, mainly the third and the fifth. Elytral striae deep and strongly impressed **2**

- Elytral interstriae flat on disc. Elytral striae not strongly impressed..... **3**

2. Major males[3]: head carina weakly or not at all elevate at sides; frontal surface with very close, coarse and sub-rugose punctures, as close as the ones of clypeal surface; pronotal anteromedian gibbosity very slightly traced. Elytral striae shallow on disc, more impressed laterally. South-Western Europe ..... ssp. ***amyntas*** (Olivier, 1789)

- Major males: head carina ending in a pair of erect horns, as long as one fourth to one third of carina width; frontal surface with shallow and spaced punctures, less close than the ones of clypeal surface; pronotal anteromedian gibbosity distinct, more or less sinuate at middle. Elytral striae barely impressed both on disc and laterally. Caucasus, Northern Iran, Central Asia ..... ssp. ***subviolaceus*** (Ménétries, 1832)

[3] I call "major" males longer than 10 mm and with well-developed pronotal anterolateral tubercles.

3. Head short, clearly wider than long (ratio 1.65 - 1.72). Pronotum with punctures strongly impressed, the larger ones separated by half to one diameter on disc. Elytral interstriae granules larger than strial punctures. Major males: head carina weakly dentate at sides, seldom horns produced but in this case barely elevate, as long as up to one fourth of carina width; frontal surface with large and very close punctures, as large and close as the ones of clypeal surface; pronotal anteromedian gibbosity very slightly traced. Central and South-Eastern Europe. Turkey, Levant..... ..... ssp. ***alces*** (Fabricius, 1792)

- Head slightly wider than long (ratio 1.52 - 1.60). Pronotum with punctures shallowly impressed, the larger ones separated by one to two diameters on disc. Elytral interstriae granules smaller than strial punctures. Major males: horns of head carina obviously elevate, as long as up to half the carina width; frontal surface with shallow and spaced punctures, smaller and more spaced than the ones on clypeal surface; pronotal anteromedian gibbosity distinct, more or less sinuate at middle. Iran .... ssp. ***auchenia*** (Redtenbacher, 1850)

Euonthophagus amyntas ssp. ***amyntas*** (Olivier, 1789)

Scarabaeus amyntas Olivier, 1789: 127; Illiger, 1803: 206 (as *Copris hübneri*)
Onthophagus amyntas: Reitter, 1892: 170; d'Orbigny, 1898: 231 (pars); Bedel, 1908: 288; Bedel, 1911: 30; Gillet & Boucomont, 1927: 119 (pars); Luigioni, 1929: 396; Winkler, 1929: 1030 (pars); Müller, 1938: 51; Focarile, 1945: 93; Porta, 1949: 345; Mikšić, 1953: 68; Horion, 1958: 17; Paulian, 1959: 86; Báguena, 1967: 74
Onthophagus amyntas var. *nigrovirescens* Seabra, 1907: 120; Báguena, 1967: 74 (as junior synonym of *O. amyntas*); Martín-Piera, 2000: 507 (as junior synonym of *O. amyntas*); Dellacasa, 2004: 171 (as chromatic variation of *O. amyntas*)
Onthophagus (*Euonthophagus*) *amyntas*: Balthasar, 1959: 467: Balthasar, 1963: 271 (pars); Mikšić, 1970: 8; Carpaneto, 1977: 27; Kabakov, 1977: 391 (pars)
Euonthophagus amyntas: Baraud, 1977: 36; Baraud, 1992: 345; Carpaneto & Piattella, 1995: 11; Kahlen & Hellrigl, 1996: 474; Ádám, 2003: 128; Martín-Piera, 2000: 362; Agoiz-Bustamante, 2002: 27; Dellacasa, 2004: 171
Scarabaeus tages Olivier, 1789: 143; Illiger, 1803: 206 (as *Copris alces*); Costa, 1853: 30 (as *Onthophagus*); Reiche, 1856: xxiii (as *Onthophagus*, junior synonym of *O. amyntas*); d'Orbigny, 1898: 231 (as *Onthophagus*, junior synonym of *O. amyntas*); Bedel, 1911: 30 (footnote, as *Onthophagus*); Luigioni, 1929: 396 (as *Onthophagus*); Martín-Piera, 2000: 507 (as *Euonthophagus*)

Type locality. "Provence" [Provence, France]
Type material. Unknown to the author (probably lost).

Diagnostic features. Length 8.0 to 12.1 mm, width 4.2 to 6.2 mm. Pronotum as long as elytra or little shorter (length ratio 0.90 to 0.97). Black, moderately shining, with microreticulation distinct on elytral surface, sometimes hardly appreciable on pronotum, pubescence dark brown to black, antennal articles dark red, antennal club black.
Head short, clearly wider than long (width/length ratio 1.66 to 1.71), clypeus broadly round on either side of very shallow median emargination, sides not sinuate in front of genae, which are protruding; clypeo-frontal carina high, strong, bent downward, not raised at sides in males, less high and raised in three points, the median one more elevate, in females; occipital carina absent; frons slightly depressed; clypeal and frontal surface with very close, rather coarse, rugose punctures.
Pronotum strongly convex, declivous towards anterior edge, with distinct anterolateral tubercle on either side and with an anteromedian not prominent fold in males, entirely unarmed in females; anterolateral angles round, sides not sinuate; dorsal surface strongly sub-regularly doubly punctuate, punctures umbilicate on disc, in both sexes; pronotal surface with a yellow pubescence very short, wide, almost undistinguishable.
Elytral striae shining, shallow on disc, more impressed laterally, their punctures crenating interstriae; the latter more or less regularly convex, sometimes bumpy to sub-callous, granulose, granules distinct, lengthened, larger than strial punctures, each of them with short fine yellow hairs.
Pygidium setigerously punctate, punctures widely and irregularly spaced, each of them with a yellow fine hair longer than elytral and pronotal ones.
Metasternal plate with a deeply concave hollow, slightly lengthened in males, not so deep, with a lengthened furrow in females.
Fore tibia spur strongly sinuate, s-shaped, acuminate apically in males, thinner and bent downward in females, longer than the first three tarsal segments. Fore tibiae inferior carina apically with a tuft of long reddish yellow hairs in males.
Male genital armature. Parameres: slender, lengthen, hooked at apex, hook outward and backward. Aedeagus internal sac with one smooth, thin and lengthened copulatory spicule, sharp and obliquely cut at one extremity (figs 23-30).
Distribution. South-Western Europe.
Material examined. Specimens from **Portugal** (75 exx.), **Spain** (19 exx.), Southern **France** (2 exx.), **Corse** (5 exx.), **Italy** (34 exx.), **Sicily** (1 ex.).
Remarks. The nominal subspecies is spread in the Iberian Peninsula, in Southern France and in Italy, eastward up to Western Slovenia. All records of the species from Alsace (Lumaret, 1990) should be confirmed since, according to Horion (1958), Köhler & Klausnitzer (1998) and Rößner (pers. com.), *Euonthophagus amyntas* is absent in Germany. The Alps are probably the barrier to the Eastern distribution of the nominal subspecies, which is represented by two different phenotypes that show slight but constant differences in elytral interstriae. All examined specimens from Portugal (more than seventy) and most from Spain

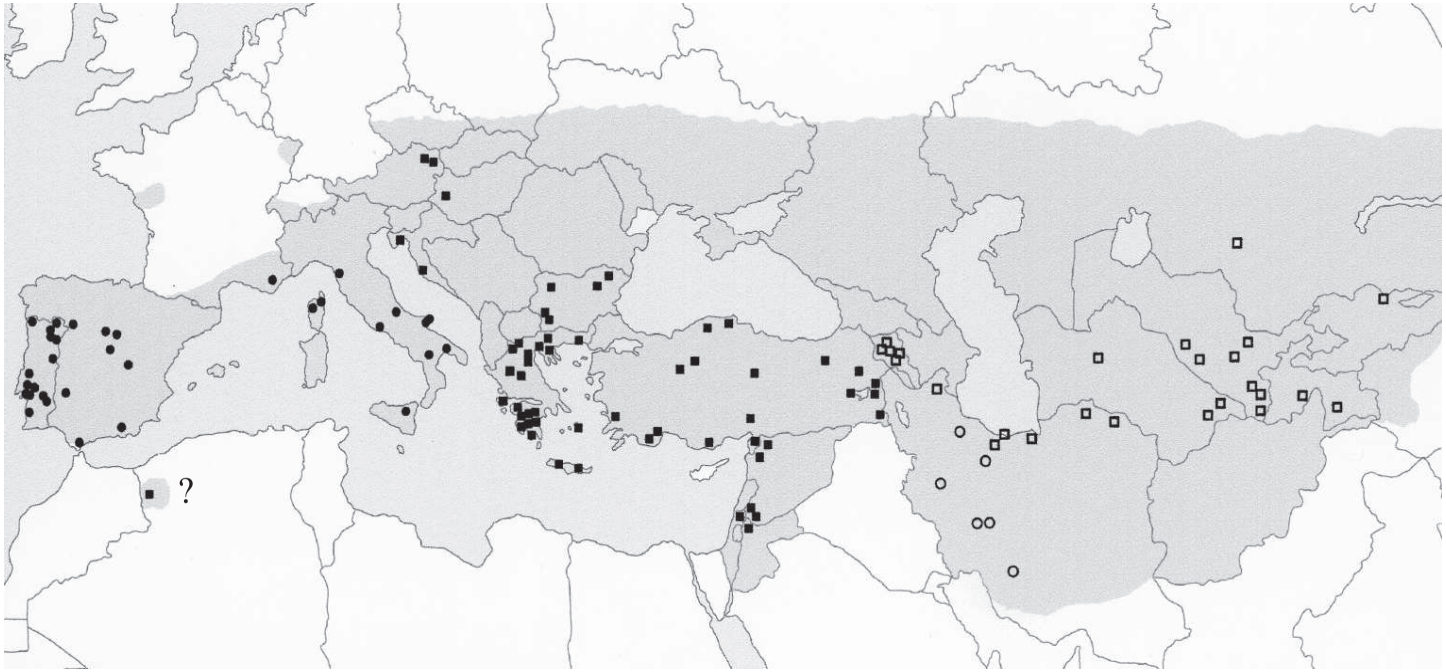


Fig. 54. *Euonthophagus amyntas* (Olivier, 1789). Distribution map.
Shading - distribution of the species *sensu lato* according to the literature.
● – ssp. *amyntas* (Olivier, 1789): checked record
■ – ssp. *alces* (Fabricius, 1792): checked record
□ – ssp. *subviolaceus* (Ménétries, 1832): checked record
○ – ssp. *auchenia* (Redtenbacher, 1850): checked record

have interstriae irregular, sub-callous or bumpy between granules (somewhat like interstriae of the Central-Asiatic subspecies). Intestriae are instead regularly convex, except for very few aberrational individuals, in specimens from France and Italy. At the present state of study, to give the two extreme phenotypes a nomeclatorial rank seems to be unnecessary.

Euonthophagus amyntas* ssp. *alces (Fabricius, 1792)

Scarabaeus alces Fabricius, 1792: 56; Megerle, 1812: 15 (as *Copris alces*)
Onthophagus alces: d'Orbigny, 1898: 231 (as junior synonym of *O. amyntas*); Bedel, 1911: 28 (footnote), 30 (footnote); Winkler, 1929: 1030 (as aberration of *O. amyntas*); Focarile, 1945: 94 (pars); Paulian, 1959: 86 (as junior synonym of *O. amyntas*) ; Zunino, 1972: 6 (as junior synonym of *O.* (*E.*) *amyntas*)
Onthophagus amyntas ssp. *alces*: Bedel, 1908: 288 (pars); Mancini, 1926: 93 (as "var."); Gillet & Boucomont, 1927: 119 (pars, as "var."); Müller, 1938: 51 (pars); Schatzmayr, 1943: 127; Porta, 1949: 345; Mikšić, 1953: 68; Mikšić, 1955: 230; Mikšić, 1957: 144; Tesař, 1957: 139; Horion, 1958: 17 (pars); Medvedev, 1965: 185; Zakharieva, 1965: 232; Bothmer, 1974: 125; Ieniştea, 1975: 142 (pars); Zakharieva et al.., 1975: 33; Koch, 1991: 353
Onthophagus (*Euonthophagus*) *amyntas* ssp. *alces*: Balthasar & Hrubant, 1960: 148 (as junior synonym of *O. amyntas*); Balthasar, 1963: 271 (doubtfully as junior synonym of *E. amyntas*); Petrovitz, 1965: 671; Machatschke, 1969: 286; Mikšić, 1970: 8; Carpaneto, 1977: 27 (pars); Shokhin, 2000: 6
Euonthophagus amyntas ssp. *alces*: Baraud, 1977: 36 (as "f. *alces*"); Paulian & Baraud, 1982: 289 (pars); Bahillo de la Puebla, 1990: 119; Baraud, 1992: 345; Král, 1993: 68; Krell, 1994: 275 (as "f. *alces*"); Juřena et al., 2000: 238; Rozner, 2001: 163; Tauzin, 2001: 112
Euonthophagus alces: Ádám, 1994: 15; Ádám, 1996: 300; Ádám & Hegyessy, 1998: 71; Ádám, 2003: 128;
Scarabaeus hybneri Fabricius, 1792: 61; Megerle, 1812: 7 (as *Copris hübneri*); Reiche, 1856: xxii (as *Onthophagus*, junior synonym of *O. amyntas*); Jacquelin du Val & Fairmaire, 1863: 127 (pars); d'Orbigny, 1898: 231 (as *hübneri*, junior synonym of *O. amyntas*); Bedel, 1908: 288 (as *hübneri*, junior synonym of *O. amyntas alces*); Bedel, 1911: 28 (footnote, as "*hübneri*"); Balthasar, 1963: 271 (as *hübneri*, junior synonym of *E. amyntas* var. *alces*)

Type locality. "Hungaria" [Hungary].
Type material. Unknown to the author (probably lost).
Discriminant features. Length 6.7 to 11.2 mm, width 3.5 to 6.3 mm. Pronotum as long as elytra or little shorter (length ratio 0.92 to 1.02).
Head short, clearly wider than long (width/length ratio 1.65 - 1.72); clypeo-frontal carina high, strong, bent downward, raised at sides in medium males, with two lateral horns as long as up to one fourth of carina width in major males; frontal

surface with large and very close punctures, as large and close as the ones of clypeal surface, in major males.
Pronotum with punctures strongly impressed, the larger ones separated by half to one diameter on disc; pronotal anteromedian gibbosity, if present, very slightly traced in males.
Elytral interstriae granules larger than strial punctures.
Male genital armature. Copulatory spicules: figs 31-41.
Distribution. Central and South-Eastern Europe, northward up to Poland. Levant[4].
Material examined. Specimens from **Austria** (6 exx.), **Hungary** (2 exx.), **Bulgaria** (9 exx.), **Croatia** (3 exx.), **Greece** (94 exx.), **Crete** (6 exx.); **Turkey** (61 exx.), **Syria** (9 exx.), **Jordan** (4 exx.), **Israel** (1 ex.).
Remarks. The *Euonthophagus amyntas* s.l. specimens from Central Europe, Balkan Peninsula, Turkey and Levant, with elytral interstriae flat, are doubtless to assign to a valid geographical race, named ssp. *alces* by most authors who dealt with the matter.
The species (s.l.) was recorded by Zunino & Tascherio (1972) also from Algeria (Aïn Séfra, Oran). The same country, with no locality, was quoted too by Kabakov (1978). I studied the specimen, a minor male, examined by Zunino & Tascherio (l. c.) and preserved in NHMB: according to the taxonomic redefinition proposed in this work it belongs to the subspecies *alces* but, anyway, the record should be confirmed before considering any discussion.

Euonthophagus amyntas ssp. *auchenia* (Redtenbacher, 1850)

Onthophagus auchenia Redtenbacher, 1850: 48; Reitter, 1891: 242 (as junior synonym of *O. amyntas*); Reitter, 1892: 170 (as junior synonym of *O. amyntas*); d'Orbigny, 1898: 231 (as junior synonym of *O. amyntas*); Gillet & Boucomont, 1927: 119 (doubtfully as junior synonym of *E. amyntas*); Luigioni, 1929: 396 (as junior synonym of *O. amyntas*); Winkler, 1929: 1030 (as junior synonym of *O. amyntas*); Panin, 1957: 78 (as junior synonym of *O. amyntas*); Balthasar, 1963: 271 (doubtfully as junior synonym of *E. amyntas*); Zunino, 1972: 6 (as junior synonym of *O.* (*E.*) *amyntas*); Lumaret, 1990: 70 (doubtfully as junior synonym of *E. amyntas*)
Onthophagus (*Euonthophagus*) *amyntas* ssp. *aspadanaensis* Petrovitz, 1965: 671 [type locality: "Kuh-räng, westl. Isfahan" [Iran]; type material: holotype male, fixed by original designation, and paratypes males (not defined number) in Petrovitz collection (MHNG) (**new synonymy**); Zunino, 1972: 6 (as junior synonym

[4] By "Levant" is herein meant the area that includes Sinaï Peninsula, Israel, Palestine, Jordan, Lebanon and Syria (Por, 1975). "Near East" is used to refer to the region encompassing the Levant, Turkey and Cyprus, Iraq and Iranian Plateau.

of *O*. (*E.*) *amyntas*); Zairi, 1976: 126; Brivio, 1977: 79; Petrovitz, 1980: 603
Euonthophagus amyntas ssp. *aspadanaensis*: Baraud, 1992: 345; Martín-Piera, 2000: 507 (as junior synonym of *E. amyntas*); Dellacasa, 2004: 171 (footnote, as "*aspadanensis*", mispelling)
Onthophagus (Euonthophagus) rechingeriorum Mandl, 1976: 372 [type locality: "Surmandeh bei Semiran[5]" [Kuh-e Surmandeh (?), Eşfahān prov., Iran]; type material: holotype male, fixed by original designation, in NMW, paratype male in Frey collection (NHMB) (**new synonymy**)

Type locality. "Südpersien" [Fārs prov.[6], South Iran].
Type material. Unknown to the author (cfr. remarks).
Discriminant features. Length 8.9 to 11.5 mm, width 4.5 to 6.1 mm. Pronotum as long as elytra or little shorter (length ratio 0.93 to 1.00).
Head slightly wider than long (width/length ratio 1.52 - 1.60); clypeo-frontal carina high, strong, bent downward, with two erect horns at sides, as long as up to half the carina width in major males; frontal surface with shallow and spaced punctures, smaller and more spaced than the ones of clypeal surface, in major males.
Pronotum with punctures shallowly impressed, the larger ones separated by one to two diameters on disc; anteromedian gibbosity distinct, more or less sinuate at middle.
Elytral interstriae granules smaller than strial punctures.
Male genital armature. Copulatory spicules: figs 42-45.
Distribution. Western Iran, from Āzārbāyjān-e Bākhtarī to Fārs province.
Material examined. 84 specimens as follows: **Iran**: "Kuh-räng / westl. Isfahan", 3 specimens ♂♂ (holotype and paratypes of *O*. (*E.*) *amyntas aspadanaensis*) (Petrovitz collection, MHNG); "Dasht-arjan / w. Shiraz – Iran", R. Petrovitz leg. 7 specimens ♂♂ and 46 specimens ♀♀ [all with two red labels "Paratypus", obviously with no nomenclatorial value, and "Onth. (Euonth.) / amyntas ssp. / aspadanaensis n. / Petrovitz"] (Petrovitz collection, MHNG); "Dasht-arjan / w. Shiraz – Iran", R. Petrovitz leg. 1 specimen ♂ and 1 specimen ♀ [♂ with two red labels "Paratypes", obviously with no nomenclatorial value, and "Onth. (Euonth.) / amyntas ssp. / aspadanaensis n. / Petrovitz"] (Balthasar collection, NMPC); "Evine (Therān)" R. Petrovitz leg. 3 specimens ♀♀ [all with two red la-

[5] "Surmandeh bei Semiran" in paratype original label, "Surmandeh bei Semirom" in original description.

[6] Redtenbacher (1859) did not precise the exact type locality, but on pages 42-46 he described the trip of Theodor Kotschy, who collected the material on which the work is based. According to this, Kotschy collected on several places not far from Shīrāz, Fārs province, but there are no exact information about the localities of the taxa.

bels “Paratypes”, obviously with no nomenclatorial value, and “Onth. (Euonth.) / amyntas ssp. / aspadanaensis n. / Petrovitz”] (Petrovitz collection, MHNG); “Surmandeh bei Semiran” 2800 m – 3000 m, 7.VI.1974, 1 specimen ♂ (paratype of *O*. (*E*.) *rechingeriorum*) (Frey collection, NHMB); Zanjān prov., Kuh-e Sendan, Zaker, 2300 m, 10.VI.2005, V. Major leg. 1 specimen ♂ and 1 specimen ♀ (SZCM); Lorestan prov., Kuh-e Oshturan, 2000 m, 22.V.2005, G. Sama leg. 2 specimens ♂♂ (SZCM); Eşfahān prov., Qomsheh, 17-19.IV.2001, S. Mersin leg. 5 specimens ♂♂ and 4 specimens ♀♀ (GDCG); Fārs prov., 3 km W of Sangai, 2000 m, 18.IV.1999, L. Nádai leg. 1 ♂ (LNCB); Bovīr Ahmadï va Kohkīlūyeh prov., 3 km N of Sisaht, 2700 m, 10-12.V. 1998, G. Fábián & K. Székely leg. 7 specimens ♂♂ and 1 specimen ♀ (LNCB).

Remarks. Heinrich Schönmann (NMW) kindly informed me that, although Redtenbacher’s types are usually preserved in Vienna Museum, he was not able to find specimens under the name *auchenia* or *amyntas* in Redtenbacher’s collection. Moreover, the late Rudolph Petrovitz, who did the re-organisation of Museum’s old collections, did not list the name *auchenia* in catalogues, that is to say he did not see any specimen with that name. “If the specimens really still exist – Schönmann concluded his personal communication – I have no idea where to look for them”. Because of this, I have interpreted the taxon and treated any nomenclatorial and taxonomic statement regarding *Euonthophagus auchenia* on the basis only of its original description, that follows.

“*Onthophagus auchenia* Redt. Niger; tibiis anticis quadridentatis, dente primo quartoque minutis rotundatis; clypeo subemarginato, thorace subtiliter punctato nitido; elytris subtilissime striato punctatis, interstitiis planis, parce squamoso-punctatis, opacis. Long. 4½”’ - 4½”’

Mas. capite linea elevata transversa, utrinque cornu recto terminata, thorace antice refuso, trituberculato, tubercolo medio alto, apice rotundato.

Femina capite linea tranversa parum elevata, trituberculata, tuberculis acutis, torace inermi.

Onthoph. Camelo affinis, sed linea elevata antefrontali nulla, thorace in mare trituberculato, in femina inermi facile distinguendus.”

Now, clypeo-frontal carina absent, elytral interstriae flat and head of male with two horns let us understand that the species described by Redtenbacher can be either the present *amyntas* ssp. *alces* or a good taxon indeed. Cephalic horns, that according the original description seem to be clearly produced, prove the second assumption. Moreover, the type locality of the Redtenbacher’s taxon is the Southern Iran, somewhere in Fārs province, whereas I never examined Iranian specimens of the ssp. *alces*, even if Petrovitz (1965) has cited the subspecies from North of Tehrān.

For the above reason, the validity of *Onthophagus auchenia* Redtenbacher, 1850 is herein supported. And since typical material seems to be lost, I believe necessary to define the taxon objectively. For this purpose, and to clarify its taxonomic

status, a major male specimen, coming nearly from the original type locality, is herein designated as neotype. It bears the following labels:
- 1st, white, printed in black: “Dasht-arjan, / w. Shiraz; Iran / leg. Petrovitz”;
- 2nd, red, printed in black: “Paratypus”;
- 3rd, red, printed in black: “Onth. (Euonthoph.) / amyntas ssp. / aspadanaensis n. / Petrovitz”;
- 4rd, white, printed in black: “Coll. / R. Petrovitz”;
- 5rd, red, printed in black: “*Euonthophagus* / *amyntas* ssp. / *auchenia* Redtenbacher, 1850 / neotype S. Ziani, 2006”.

The specimen is preserved in MHNG.

The subspecies *aspadanaensis* of *Onthophagus* (*Euonthophagus*) *amyntas* was

Fig. 55. *Euonthophagus verberatus* n.sp.. Dorsum of male, holotype [Iran, Eşfahān prov., Qomsheh].

described by PETROVITZ (1965) on some males from Eşfahān province, Central Iran. Later, the same author (PETROVITZ, 1980) provided the description of the female and recorded the subspecies from other Iranian localities, in Fārs, Tehrān, Āzārbāyjān-e Bākhtarī and Māzandarān provinces. ZUNINO (1972), only on the basis of the study of genital armatures, stated the synonymy with *E. amyntas*. The original description of *O. auchenia* fits almost perfectly the characters of Petrovitz's *aspadanaensis*, so the synonymy *Onthophagus amyntas* ssp. *aspadanaensis* Petrovitz, 1965 = *Euonthophagus amyntas* ssp. *auchenia* (Redtenbacher, 1850) is proposed.
MANDL (1976) described *Onthophagus (Euonthophagus) rechingeriorum* on two males from "Surmandeh bei Semiran", Iran (most probably in Eşfahān province). He compared the new species with a northern-African species, *Euonthophagus crocatus* Mulsant & Godart, 1873, but failed to confront it with *Euonthophagus amyntas* and its Iranian subspecies *auchenia*. I have examined the paratype of *O. rechingeriorum*: its external morphological characters, as well as apex of parameres, convinced me that *Onthophagus* (*Euonthophagus*) *rechingeriorum* Mandl, 1976 is a junior synonym of *Onthophagus* (*Euonthophagus*) *aspadanaensis* Petrovitz, 1965, therefore, a junior synonym of *Euonthophagus amyntas* ssp. *auchenia* (Redtenbacher, 1850).

Euonthophagus amyntas ssp. ***subviolaceus*** (Ménétries, 1832)
Onthophagus subviolaceus Ménétriés, 1832: 177; Kolenati, 1846: 10 (as junior synonym of *O. hybneri*); Reitter, 1891: 242 (as junior synonym of *O. amyntas*); Reitter, 1892: 170 (as junior synonym of *O. amyntas*); d'Orbigny, 1898: 231 (as junior synonym of *O. amyntas*); Olsoufieff, 1906: 195; Bedel, 1908 (as junior synonym of *O. amyntas alces*); Winkler, 1929: 1030 (as junior synonym of *O. amyntas* a. *alces*); Tesař, 1957: 139 (as junior synonym of *O. amyntas* ssp. *alces*); Balthasar, 1963: 271 (as junior synonym of *E. amyntas* var. *alces*); Zunino, 1972: 6 (as junior synonym of *O.* (*E.*) *amyntas*)
Onthophagus amyntas ssp. *subviolaceus*: Heyden, 1896: 48 (as var.); Petrovitz, 1959: 105; Petrovitz, 1961a: 34
Onthophagus (*Euonthophagus*) *amyntas* ssp. *subviolaceus*: Gillet & Boucomont, 1927: 119 (as junior synonym of *O. amyntas* var. *alces*); Petrovitz in Carpaneto, 1977: 27
Onthophagus hybneri var. *subviolaceus*: Jacquelin du Val & Fairmaire, 1863: 127

Type locality. "Bakou" [Baku, Azerbaijan].
Type material. Probably in Zoological Institute, Russian Academy of Sciences, St. Petersburg (Russia), not seen by the author.
Discriminant features. Length 8.8 to 11.8 mm, width 4.7 to 6.7 mm. Pronotum as long as elytra or little shorter (length ratio 0.91 to 1.00).
Head short, clearly wider than long (width/length ratio 1.59 - 1.70); head carina

ending in a pair of erect horns, as long as one fourth to one third of carina width, in major males; clypeal punctation close, sub-rugose; frontal punctation, at middle, fine, shallow, spaced, in major males.
Pronotum with punctures strongly impressed, the larger ones separated by half to one diameter on disc; pronotum anteromedian prominence distinct, more or less clearly sinuate at middle, in major males.
Elytral striae shallow both on disc and laterally; elytral interstriae bumpy to subcallous, with granules larger than strial punctures.
Male genital armature. Copulatory spicules: figs 46-53.
Distribution. North-Eastern Turkey, Caucasus, Iran, Central Asia.
Material examined. Specimens from **Armenia** (45 exx.), **Turkmenistan** (22 exx.), **Uzbekistan** (20 exx.), **Tagjkistan** (3 exx.), **Kyrgyzstan** (4 exx.), **Kazakhstan** (2 exx.), Northern **Iran** (84 exx.).
Remarks. Ménétries (1832) described *Onthophagus subviolaceus* from Transcaucasus. The author distinguished the new specie from O. *hybneri* by the length, larger in *O. subviolaceus*, and for elytral interstriae, convex and bumpy between granules. Further on, according to Ménétries, males of *O. subviolaceus* have the head carina strong and ending in two horns at sides and the anteromedian gibbosity prominent and bilobate. All the subsequent authors considered Ménétries's taxon as synonym of *Euonthophagus amyntas*, except Heyden (1896), Olsoufieff (1906) and Petrovitz (1959). Particularly the latter author, on the basis of body size, pronotal punctation and elytral interstriae, deemed *subviolaceus* subspecies of *amyntas*. The race is geographically restricted to the Western-Central Asia.
Regarding external morphology, the character of the interstriae is useful to separate the Ménétries's taxon from the ssp. *alces*, but not from the nominotypical subspecies that, mainly in the specimens from Iberian Peninsula, has elytral interstriae convex and bumpy. On the other hand, major males' carina and anteromedian gibbosity, together with geographical distribution, warrant to consider them as two different taxa. For all these reasons Petrovitz's interpretation is herein accepted.
Kabakov (1978) recorded *Euonthophagus amyntas* s.l. from China (Xinjiang, Chinese Turkestan). I have not been able to examine specimens from this area but it seems reasonable to think that Chinese specimens belong to the ssp. *subviolaceus*.

* * *

As a result of this study the total number of *Euonthophagus* species known to occur in Iran is brought to 13, one of them polytypic, and three Iranian endemisms. A dichotomical key to all species is herein provided. The key is based on external morphologic characters of both sexes, when it is possible, otherwise on characters of major males only.

Key to the Iranian species of the genus ***Euonthophagus*** Balthasar, 1959

1. Head and pronotum with, at side, yellow or yellowish white setae **2**

- Head and pronotum with, at side, black or blackish brown setae..... **3**

2. Males with clypeal margin sub-denticulate anteriorly and clypeo-frontal carina apically bifurcate. Females with pronotal anteromedian gibbosity, bilobate in major specimens. Iran, Afghanistan .... ***pentaceros*** (Olsoufieff, 1900)

- Males with clypeal margin round anteriorly and clypeo-frontal carina raised at middle. Females with pronotum not armed. Iran ....***aeneobrunneus*** (Kabakov, 1978)

3. Elytral surface verrucose, pustulate, lobes and protuberances irregularly shaped, shiny, Iran ..... ***verberatus*** n.sp.

- Elytral surface smooth, without shiny elevations, at most bumpy or subcallous **4**

4. Male's head without carinae..... **5**

- Male's head with an obvious frontal carina **6**

5. Clypeal margin bilobate, sub-denticulate anteriorly; males with cephalic horns placed in the posterior half of head, pronotal anteromedian prominence almost muticus and metasternal plate flat. Iran, Afghanistan, Pakistan..... ***pertinax*** (Balthasar, 1959)

- Clypeal margin barely emarginate anteriorly; males with cephalic horns placed about at middle of head, pronotal anteromedian prominence clearly produced and metasternal plate deeply concave. Iran..... ***yama*** n.sp.

6. Metasternal plate flat or with a slight longitudinal line. Elytra black, sometimes yellow. Central and Southern Europe; Near East, eastward up to Central Asia and Western China ..... ***gibbosus*** (Scriba, 1790)

- Metasternal plate with an obvious hollow, more or less lengthened. Elytra black or dark brown..... **7**

7 Metasternal hollow not reaching the posterior margin of the plate **8**

- Metasternal hollow reaching the posterior margin of the plate **10**

8. Males with fore tibia spur long and strongly sinuate, s-shaped. Males fore tibial apical brush formed by trichia shorter than the first tarsal segment. Length 7 – 12.5 mm. Central-Southern Europe; Near East, Central Asia, up to Western China ..... ***amyntas*** (Olivier, 1789) s.l.

- Males with fore tibial spur short, broad, stout. Males fore tibial apical brush formed by trichia as long as the first tarsal segment..... **9**

9. Pronotal large punctures strongly impressed, separated by half to two diameters laterally. Iran, Iraq..... ***loeffleri*** (Petrovitz, 1965)

- Pronotal large punctures shallowly impressed, separated by half diameter or less, laterally. South-Eastern Europe; Near East, eastward to Afghanistan. Egypt..... ***atramentarius*** (Ménétries, 1832)

10. Male's fore tibia without brush apically..... **11**

- Male's fore tibia with an apical tuft formed by dark yellow or brown trichia **12**

11. Pronotal large punctures circular, separated by one to two diameters on disc. Iran, Afghanistan. Turkey (see remarks) .... ***dorbignyi*** (Olsoufieff, 1900)

- Pronotal large punctures irregular, separated by less than one diameter on disc. Algeria, Tunisia, Libya; Levant, Iran..... ..... ***conterminus*** (Petrovitz, 1971)

12. Pronotal large punctures ocellate, separated by half to one diameter on disc. Males clypeo-frontal carina almost straight. Iran, Iraq..... ..... ***mostafatsairi*** Palestrini, Varola & Zunino, 1979

- Pronotal large punctures simple, separated by one to two diameters on disc. Males clypeo-frontal carina slightly backward bent. Turkey, Iran, Afghanistan, Central Asia..... ***sulcicollis*** (Reitter, 1892)

Remarks. Since 1971, according to Palestrini et al. (1979), Petrovitz recognized a new *Euonthophagus* species from Central Iran and gave it *in litteris* the name *mostafatsairii*, dedicated to his friend Mostafa Tsairi. In 1974 Petrovitz died without seeing published the name that, anyway, was used as *nomen nudum* by Zunino & Tascherio (1972) and Brivio (1977). In 1979 Palestrini et al. described *Euonthophagus mostafatsairi* on specimens from Petrovitz collection and stated with an explicit remark that the new species was the same recognized but not published by Petrovitz. In 1980 the description of Petrovitz's species, as *Onthophagus* (*Euonthophagus*) *mostafa-tsairii* (to be corrected in *mostafatsairii*), was finally published. As far as I know such name was used only once by Barari (2001)[7]. According to Articles 58 and 58.14 of the International Code of Zoological Nomenclature, 4th edition, *Euonthophagus mostafatsairii* (Petrovitz, 1980) is a junior secondary homonym of *Euonthophagus mostafatsairi* Palestrini, Varola & Zunino, 1979, but, having the same holotype (checked and confirmed by Giulio Cuccodoro, MHNG), is also its junior objective synonym and, as such, permanently invalid.

[7] As "*Euonthophagus mostafa sairii* Petrovitz", misspelling.

The characters used in the previous key to separate *E. mostafatsairi* and *E. sulcicollis* are the ones supplied by Petrovitz in his description of *Onthophagus* (*Euonthophagus*) *mostafatsairii*. They are very feeble, and it is not easy at all to separate the two species on the basis of external morphologic features, even in major specimens. On the other hand the morphology of paramera apex (cfr. PETROVITZ, 1980: 600, figs 2 and 3) provides a clear differentiation of the two species.

In the same posthumous work, PETROVITZ (1980) described another new Iranian species, *Onthophagus* (*Euonthophagus*) *markaziensis*, from Markazī province. Also in this case the name was known *in litteris* since 1971. According to PALESTRINI et al. (1979) the specimen preserved in Petrovitz collection that would become the holotype of *O.* (*E.*) *markaziensis* matches perfectly the description of *Onthophagus* (*Euonthophagus*) *aeneobrunneus* (Kabakov, 1978) (type locality: Iran, Khorāsān province). This statement is to be considered as a simple opinion and not a nomenclatural act, since it is not possible to synonymyze a species whose name is still *in litteris*, therefore not available. Anyway, since I was unable to examine type material of the two species, I have to accept the opinion of PALESTRINI et al. (l.c.).

Euonthophagus dorbignyi (Olsoufieff, 1900) is herein recorded from Turkey for the first time. I have examined three specimens (**TURKEY**: Gaziantep distr., Gaziantep env., 11.VI.1989, E. & G. Dellacasa leg. 2 ♂♂ (GDCG; SZCM) and 1 ♀ (GDCG)) that have to be assigned without any doubt to this species.

PETROVITZ (1959), ZUNINO (1972), ZUNINO & TASCHERIO (1972), BORTESI & ZUNINO (1974), KABAKOV (1978) and BARAUD (1982) recorded from Iran, too, *Euonthophagus bedeli* (Reitter, 1891), a North-African species (type locality: "Algier, Laghonat, Ghardata", Algeria) spread from Morocco to Lybia. In 1971 PETROVITZ described (type locality: "Beersheba", Israel) a subspecies *conterminus* of *bedeli*, distinguishable from the nominotypical species by the morphology of paramera. Later BARAUD (1984) described *Euonthophagus rapilly* (type locality: "Ramat Boqer" , Israel). Afterwards BARAUD himself (1987) and CARPANETO & PIATTELLA (1987) synonymized *rapilly* with *conterminus*, upgrading the latter to specific rank. It is reasonable to think that all Iranian records of *E. bedeli* are to be ascribed to *E. conterminus*. Anyway, I examined the male recorded from Iran, Elburz Mountains (coll. Frey, NHMB) and quoted as *bedeli* by ZUNINO (1972) and ZUNINO & TASCHERIO (1972). It is a specimen of *Euonthophagus conterminus* (Petrovitz, 1971) indeed.

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