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Two sibling species of the genus *Agrilinus* Mulsant & Rey, 1870 (Coleoptera: Scarabaeoidea: Aphodiidae): *Agrilinus lungaiensis* Petrovitz, 1962 and *Agrilinis pseudolungaiensis* sp. nov.

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Abstract. A new species of the genus *Agrilinus* Mulsant et Rey, 1870 is described and illustrated: *Agrilinus pseudolungaiensis* sp. nov. from China (Sichuan Province). Comparison of the *Agrilinus pseudolungaiensis* sp. nov. with related species, particularly with the sympatric sibling species *Agrilinus lungaiensis* Petrovitz, 1962 is discussed and appropriate photographs of the sibling species are first presented. Differences between the genera *Agrilinus* and *Agoliinus* are briefly commented.

INTRODUCTION

In the work presented here, the authors offer a description of a new species of the genus *Agrilinus* encountered in the course of their study of some unidentified species of Aphodiidae from Asia.

In our work (Rakovič M. & Mencl L., 2011) dealing with the genus *Agoliinus* Schmidt, 1913 we explained our reasons for adopting the "concept of genera" established in a work by Dellacasa G., Bordat and Dellacasa M. (2001), in which most groups of Aphodiini, formerly considered as subgenera of the big genus *Aphodius* Illiger, 1798 (see for example Schmidt (1922) or Balthasar (1964)), were raised to genera. The thing is that it is no more acceptable to use different systems for Coleoptera from different zoogeographical regions. For example, one cannot consider species of the genus *Agoliinus* for American beetles and species of the subgenus *Agoliinus* for Palearctic ones.

MATERIAL AND METHODS

Specimens of the species described or discussed here were examined as specified below.

The following abbreviations stand for collections, in which the specimens studied here are kept:

LM collection of Ladislav Mencl, Týnec nad Labem, the Czech Republic;
MR collection of Miloslav Rakovič, Dobřichovice, the Czech Republic;

NMP National Museum, Prague, the Czech Republic;
VKCB collection of Vítězslav Kubáň, Brno, the Czech Republic;
DKCP collection of David Král (deposited in National Museum Prague, the Czech Republic).

In addition to the study of material of the two sibling species discussed here, as specified below in Results, the authors took advantage of examining comparatypes/topotypes: of the *Agrilinus surdus* (Boucomont, 1929), *Agrilinus languiensis* (Petrovitz, 1962) and *Agrilinus wassuensis* (Petrovitz, 1962), all from DKCP, equipped with the following labels: Sungpan, Szetchuan, A. (Agrilinus) surdus Boucomont, compared with the type from Paris, David Král det. 95, TOPOTYPUS, 1347 Dok. L. Mencl; W. Szechuan, China, Sankiangkou, leg. Friedrich, Lungai 7.1934, 2000m, Wassuland, Aphodius lungaiensis Petr., David Král det. 01, COMPARATYPUS (TOPOTYPUS), 1344 Dok. L. Mencl; and W. Szechuan, China, Sankiangkou, leg. Friedrich, Selong 4000 m, 7.-8.1934, Museum Frey Tutzing, Wassuland, Museum Frey Tutzing, Aphodius wassuensis Petr., David Král det. 01, COMPARATYPUS (TOPOTYPUS), 1346 Dok. L. Mencl, respectively.

The specimens were examined with the use of the MBS-10 and SZP 1120-T stereoscopic microscopes, Meopta laboratory microscope and CMOS 5 digital camera with the Helicon Focus programme.

Measurements were carried out with an ocular micrometer.

Aedeagi were treated by boiling with a 10% sodium carbonate solution and their photos were taken after their immersion in the L.o.c. detergent (Amway Corp., USA).

RESULTS

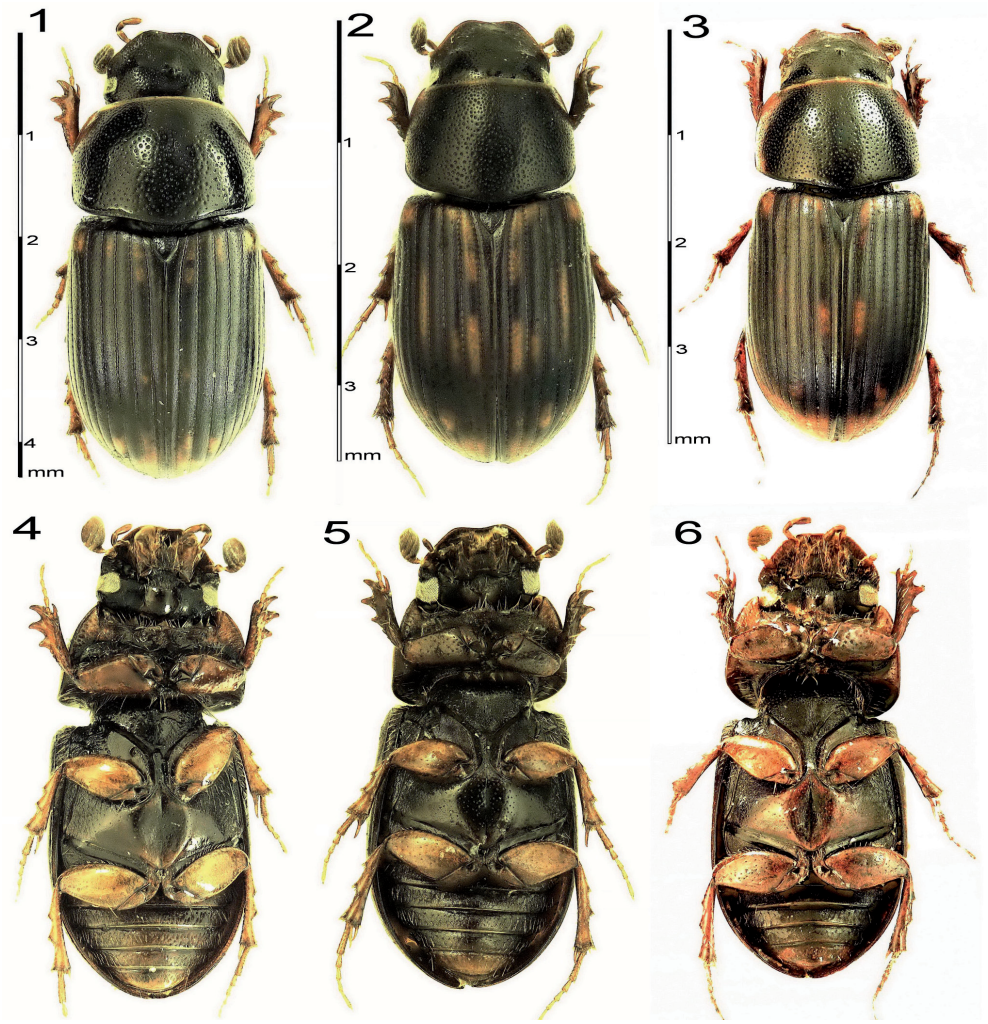
Agrilinus lungaiensis (Petrovitz, 1962) comb. nov.

(Figs 3, 6, 8, 10, 12, 14, 17, 18, 22-24)

Aphodius (Agrilinus) lungaiensis Petrovitz, 1962: 121.
Aphodius (Agrilinus) lungaiensis: Dellacasa M. & Dellacasa G., 2006: 109 (Catalogue).

Material examined. 44 specimens: CHINA, 2000-2250m, Shaanxi, Qinling mts., XUNYANGBA (12 km SW), 14-18.vi 1998, I. H. Marshal leg. – VKCB (15 ♂♂, 15 ♀♀) LM (3 ♂♂, 3 ♀♀) MR (3 ♂♂, 3 ♀♀) DKCP (1 ♂, 1 ♀).

Notes. The species was originally described based on a unique holotype without any illustration. Appropriate photos of the habitus (Figs 3, 6, 10, 12), epipharynx (Fig. 8), aedeagus (Fig. 14) and metasternal plates (Figs 17-18) are presented here. The examination of the large number of specimens also made it possible to show the colour variability (Figs 22-24). The differences between the *Aphodius (Agrilinus) lungaiensis* Petrovitz, 1962 and the sympatric sibling species *Agrilinus pseudolungaiensis sp. nov.* described below are summarized in Table 1.



Figs 1-6. Dorsal and ventral aspects: 1- *Agrilinus pseudolungaiensis* sp. nov., holotype, male, dorsal view; 2- *A. pseudolungaiensis* sp. nov., allotype, female, dorsal view; 3- *A. lungaiensis* (Petrovitz, 1962), male, dorsal view; 4- *A. pseudolungaiensis* sp. nov., holotype, male, ventral view; 5- *A. pseudolungaiensis* sp. nov., allotype, female, ventral view; 6- *A. lungaiensis* (Petrovitz, 1962), male, ventral view.

***Agrilinus pseudolungaiensis* sp. nov.**

(Figs 1-2, 4-5, 7, 9 11, 13, 15, 16, 19-21)

Type material. Holotype ♂ (VKCB): CHINA, 2000-2250m, Shaanxi, Qinling mts., XUNYANGBA (12 km SW), 14-18.vi 1998, I. H. Marshal leg.; Allotype ♀ (VKCB): same data. Paratypes: same data (24 ♂♂**,** 30 ♀♀**) -** 34 VKCB, 8 LM, 7 MR, 3 DKCP. [Each type specimen is equipped with a printed white label specifying the locality data as mentioned above and printed red label HOLOTYPE, ALLOTYPE or PARATYPE, respectively, *Agrilinus pseudolungaiensis* sp. nov. ♂ or ♀**,** L. Mencl & M. Rakovič L. det. 2012 and some specimens are also equipped with printed pale green labels (specifying the photographic documentation by L. Mencl)].

Description. Small (3.8-4.7 mm), oblong oval, moderately broader behind, glabrous, finely microreticulate and thus only moderately shining. Head black, pronotum black with reddish yellow lateral margins, elytra dark brown to black with reddish yellow markings and reddish yellow apex, legs dark brown. For habitus see Figs 1 and 2 (dorsal view of male and female, respectively) and 9 and 11 (lateral view of male and female, respectively).

Clypeus emarginate anteriorly, quite rounded and moderately upturned each side of emargination; clypeus lateral margins straight and not differentiated or only slightly differentiated from anterior margins of frontal lobes (genae); frontal lobes at most only slightly more protruding than eyes, each with 1-2 short setae. Frontal suture distinct (see the paragraph Sexual dimorphism below). Epistome only slightly elevated. Head surface finely punctate, rather irregularly uneven along clypeal margins.

Pronotum wider than long, widest about at middle, considerably continuously narrowed toward anterior angles and only moderately narrowed toward posterior angles. Pronotum lateral edges, posterior corners and base with distinct, complete margin line. Pronotum surface with medium-sized punctures (larger than punctures on head), intermixed with fine punctures (smaller than those on head).

Scutellum triangular, microreticulate, with irregularly uneven surface and few punctures situated in anterior two thirds.

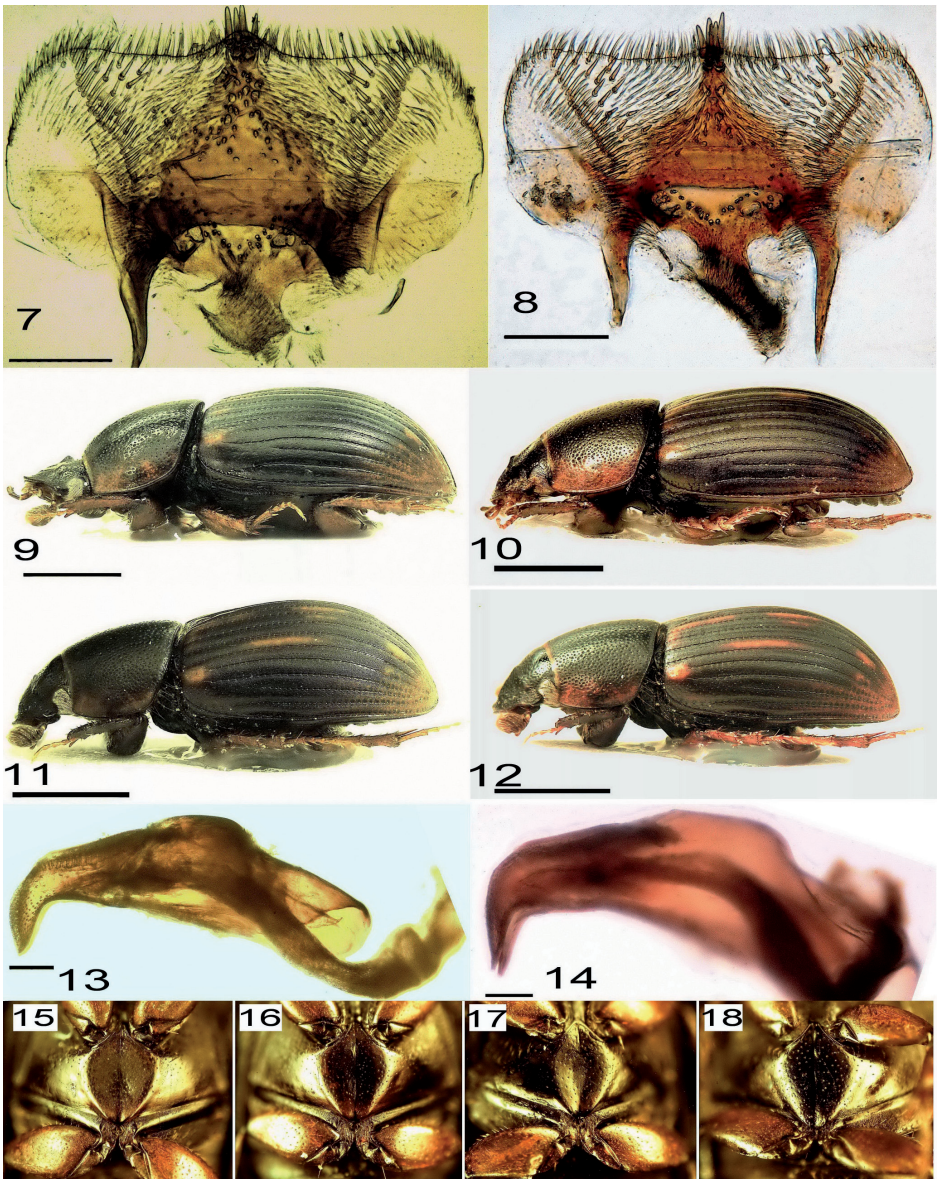
Elytra widest behind middle, with ten striae and ten intervals, with distinct humeral calluses, without humeral denticles. Dark brown to black with reddish yellow markings, most frequently arranged as follows: short spots at base in third and fifth intervals; small humeral spot (at base in sixth and seventh intervals; two longer spots in second interval (at base and behind middle); longer spot at base and small preapical spot in fourth interval; apical area occupying second to tenths intervals (gradually longer from medial to lateral intervals); some of these markings can be absent; some additional ones can also be present (long spot at middle in fifth interval, short spot at middle in third interval); preapical and basal spots are always present. Elytral intervals moderately convex, shagreened, very finely punctate (on disc, with 2-3 punctures per interval width). Striae with medium-sized punctures moderately crenating intervals.

Legs dark brown. Metatibia apex fringed with short setae equal in length; superior terminal spur length of about 2/3 basimetatarsite length.

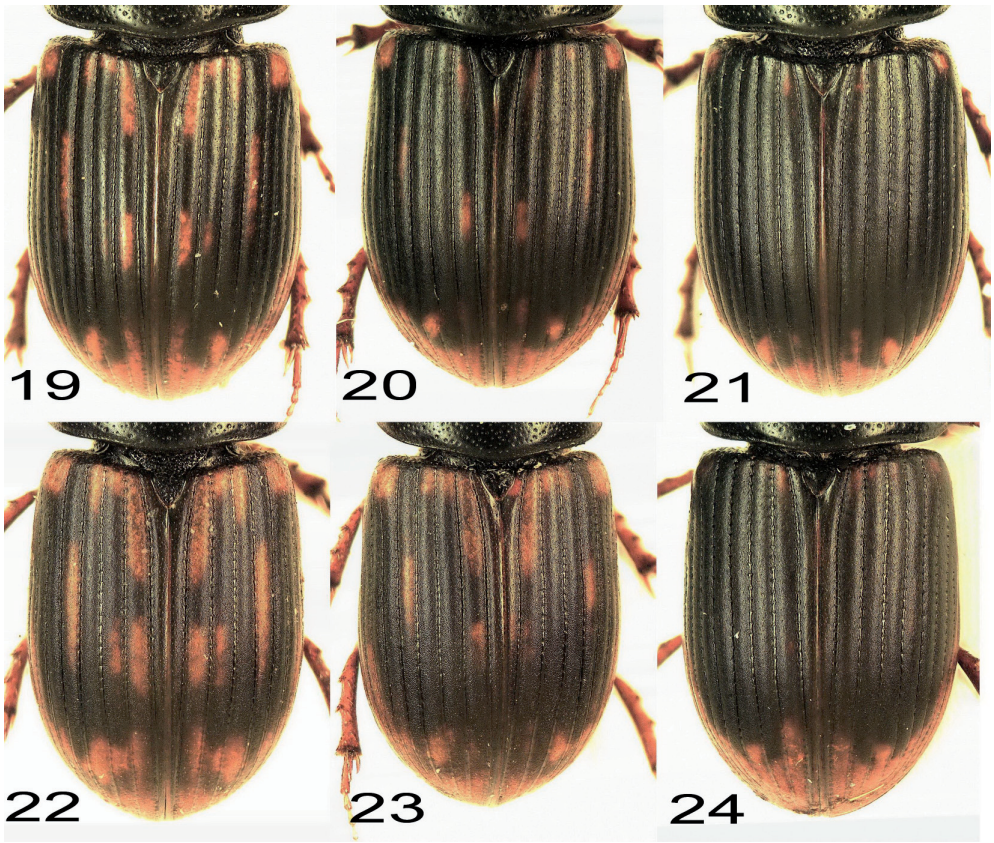
Ventral surface (see Figs 4 and 5 for male and female, respectively) mostly dark brown, femora and some areas of metasternal plate and abdominal sternites lighter. Metasternal plate (see Figs 15 and 16 for male and female, respectively) shining, smooth, finely sparsely punctate, with distinct oval impression in males and distinct, narrow longitudinal furrow in females extended from posterior margin of metasternal plate nearly to its anterior margin; lateral margins of metasternum strongly shagreened and scabrous, bearing short, recumbent setae. Abdominal sternites 1 and 2 scabrous throughout, sternites 3-5 scabrous laterally and finely punctate medially; all sternites laterally with rather long, semierect setae; sixth sternite and pygidium with few long, erect setae. Femora sparsely, finely punctate; metafemur with distinct row of light, medium-sized setae along anterior edge.

Aedeagus as in Fig.13. Apical part of paramere bent downward at obtuse angle with a dorsal pale and matte “pillow-like” area extended from apex to point of bending.

Epipharynx as in Fig. 7.



Figs 7-18. Epipharynx, lateral aspect, aedeagus and metasternal plate: 7- *Agrilinus pseudolungaiensis* sp. nov. holotype male, epipharynx; 8- *Agrilinus lungaiensis* (Petrovitz, 1962), male, epipharynx; 9- *Agrilinus pseudolungaiensis* sp. nov., holotype, male, lateral view; 10- *A. lungaiensis* (Petrovitz, 1962), male, lateral view; 11- *A. pseudolungaiensis* sp. nov., allotype, female, lateral view; 12- *A. lungaiensis* (Petrovitz, 1962), female, lateral view; 13- *A. pseudolungaiensis* sp. nov., holotype, aedeagus, lateral view; 14- *lungaiensis* (Petrovitz, 1962), aedeagus, lateral view; 15- *A. pseudolungaiensis* sp. nov., holotype, male, metasternal plate ; 16- *Agrilinus pseudolungaiensis* sp. nov., allotype, female, metasternal plate; 17- *A. lungaiensis* (Petrovitz, 1962), male, metasternal plate; 18- *A. lungaiensis* (Petrovitz, 1962), female, metasternal plate. Scale lines: 0.1 mm for Figs 7, 8, 13, 14; 1 mm for Figs 9-12.



Figs 19-24. Colour variability: 19- *Agrilinus pseudolungaiensis* sp. nov., lighter forms ; 20- *A. pseudolungaiensis* sp. nov., intermediate forms; 21- *A. pseudolungaiensis* sp. nov., darker forms; 22- *A. lungaiensis* (Petrovitz, 1962), lighter forms; 23- *A. lungaiensis* (Petrovitz, 1962), intermediate forms; 24- *A. lungaiensis* (Petrovitz, 1962), darker forms.

Sexual dimorphism. Males: frontal suture with a blunt but quite distinct central tubercle and two lateral transverse elevations; metasternal plate with a distinct oval impression. Females: frontal suture with three transverse elevations only, lateral elevations being sometimes even higher than central one; metasternal plate with a distinct, narrow, nearly complete (only slightly reduced anteriorly) longitudinal furrow.

Differential diagnosis. The *Agrilinus pseudolungaiensis* sp. nov. is very closely related to the *Agrilinus lungaiensis* (Petrovitz, 1962). Differences between the two sympatric sibling species can be summarized as shown in Table 1.

Table 1. Differences between characters of two closely related species

***Agrilinus lungaiensis* (Petrovitz, 1962)**	***Agrilinus pseudolungaiensis* sp. nov.**
The apical part of paramere bent at right angle (Fig. 14); with a dorsal pale and matte area extended from apex to middle of the apical part. Paramere tip narrow.	The apical part of paramere bent at obtuse angle (Fig. 13); with a dorsal pale and matte area extended from apex to the point of bending. Paramere tip wider.
Male inferior apical spur of mesotibia with abruptly truncate and bent (hooked) tip (like in *Agoliinus*).	Male inferior apical spur of mesotibia continuously moderately arcuate and narrowed toward its tip.
Smaller on average (3.4-4.1 mm).	Larger on average (3.8-4.7 mm).
Elytral intervals more distinctly microreticulate and thus matter	Elytral intervals more finely microreticulate and thus moderately shining
Punctures of metasternal plate shallower and thus less distinct	Punctures of metasternal plate deeper and thus more distinct

The new species can also be compared with the *Agrilinus surdus* (Boucomont, 1929) and *Agrilinus wassuensis* (Petrovitz, 1962), which, however, particularly differ from the new species by their considerably shagreened dorsal surface. In terms of the shape of parameres, the new species is most distinctively different among these four species.

Name derivation. A combination of the prefix *pseudo-* and specific name of the very similar species *Agrilinus lungaiensis* (Petrovitz, 1962).

DISCUSSION AND CONCLUSION

In the differential diagnosis (Table l, presented here) the shape of the inferior apical spur of the male mesotibia in the *Agrilinus lungaiensis* (Petrovitz, 1962) is of interest, which is a character originally used by A. Schmidt (1913) to separate *Agoliinus* from *Agrilinus*. Petrovitz (l962) really noticed this character in his species, but refused to recognize the separation of the two groups one from another just based on a character resulting from the sexual dimorphism. Based on the current status of the literature as well as on our experience with the genus *Agoliinus* (Rakovič M. & Mencl L., 2011) we believe that within the framework of the topical concept of the genera of Aphodiinae, the presence or absence of dorsal appendages on parameres in *Agoliinus* or *Agrilinus*, respectively, as used by (Gordon & Skelley, 2007), is more important compared to the shape of the inferior apical spur of the male mesotibia.

Due to this, the species *Agrilinus lungaiensis* (Petrovitz, 1962), which is most closely related to the new species described here, was correctly included in *Agrilinus* by Dellacasa M. & Dellacasa G. (2006).

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