

***Agrilinus monikae* sp. nov. (Coleoptera: Scarabaeidae: Aphodiinae) from the Tibetan plateau, associated with burrows of small mammals**

David KRÁL

Charles University in Prague, Faculty of Science, Department of Zoology,  
Viničná 7, CZ-128 43 Praha 2, Czech Republic  
e-mail: kral@natur.cuni.cz

**Taxonomy, new species, Coleoptera, Scarabaeoidea, Aphodiinae, Aphodiini, *Agrilinus*, Lagomorpha, Rodentia, *Ochotona*, *Marmota*, Gansu, Sichuan, Qinghai, Palaearctic Region**

**Abstract.** *Agrilinus monikae* sp. nov. from Gansu, Qinghai and Sichuan (China) is described and its diagnostic characters are illustrated. The new species is compared with similar and probably closely related complex of the following species: *Agrilinus lungaiensis* (Petrovitz, 1962), *A. pseudolungaiensis* Mencl et Rakovič, 2012, *A. surdus* (Boucomont, 1929) and *A. wassuensis* (Petrovitz, 1962). The differential diagnosis is based mainly on different structure of dorsal surface and on the shape of aedeagus. Life history of the new species is tied with excrements and burrows of *Ochotona* sp. (Lagomorpha) and *Marmota himalayana* (Hodgson, 1841) (Rodentia).

## INTRODUCTION

According to recent catalogues (Dellacasa 1988, Dellacasa & Dellacasa 2006) the genus *Agrilinus* Mulsant et Rey, 1870 (in these studies treated as a subgenus of the genus *Aphodius* Illiger, 1798) comprises about 30 described species. They are distributed throughout the Palaearctic Region (cf. e. g., Balthasar 1964, Dellacasa et al. 2001, Dellacasa & Dellacasa 2006). Only a few recent papers are dealing with taxonomy of this group, morphological limits of this genus are not well defined and therefore a revision of most species is badly needed (cf. e. g., Dellacasa & Dellacasa 2005, Mencl & Rakovič 2012). Many Holarctic Aphodiinae species show close associations with various mammals or at least their burrows, primarily rodents and lagomorphs (cf. e. g. Balthasar 1964, Hanski & Cambefort 1991, Gordon & Skeley 2007, Nikolajev 1987, Nikolajev & Puntsagdulam 1984). So far only scarce literature data on such nidicolous Aphodiini species have been available from the Tibetan plateau, related only to genera *Calamosternus* Motschulsky, 1859 and *Qingaphodius* Král, 1997 (Červenka 1994, Král 1997). One remarkable new *Agrilinus* species tied with burrows of *Ochotona* sp. and *Marmota himalayana* (Hodgson, 1841) from the Chinese provinces Gansu, Sichuan and Qinghai is described below.

## MATERIAL AND METHODS

The following abbreviations identify the collections housing the material examined:

- BZCL Bohdan Zvarič, private collection, Lovosice, Czech Republic;  
DKCP David Král, collection (deposited in NMPC);  
LMCT Ladislav Mencl, private collection, Týnec nad Labem, Czech Republic;

MRCĐ Miloslav Rakovič, private collection, Dobřichovice, Czech Republic;  
NMPC National Museum, Praha, Czech Republic (Jiří Hájek).

Specimens were examined with an Olympus SZ61 stereomicroscope, measurements were taken with an ocular graticule. The habitus photographs were taken using a Canon MP-E 65mm/2.8 1-5x Macro on bellows attached to a Canon EOS 550D camera. Partially focused images of each specimen were combined using Helicon Focus 3.20.2Pro software. Specimens of the newly described species are provided with one printed red label: *Agrilinus monikae* sp. nov., HOLOTYPUS [or] ALLOTYPUS [or] PARATYPUS, David Král det. 2007". Exact label data are cited for the material, individual lines within every label are separated by a slash "/". Information in quotation marks indicates the original spelling. Author's remarks and additional comments are found in brackets.

## TAXONOMY

### *Agrilinus monikae* sp. nov.

(Figs 1-5)

**Type locality.** China, Qinghai province, A'nyêmaqênshan [mts], Huashixia, 3800-4200 m a. s. l.

**Type material** (71 specimens). China, Qinghai: Holotype ♂ (DKCP), "CHINA-Qinghai, A'nyê- / maqên Shan, Huashixia / 28.-30.vi.1994, 3200- / 4300 m, B. Zvarič lgt. [printed]". Paratypes: allotype ♀, (DKCP) and 23 not sexed spec. (DKCP), 30 not sexed spec. (BZCL), 1 ♂, 1 ♀ (LMCT), 1 ♂, 1 ♀ (MRCĐ), same data; China, Gansu: 1 ♂ (DKCP), "CHINA Gansu reg. / 4200 m, M. Nikodým lgt. 1990 / Dogcanghamo 12-15.vii. [printed]"; China, Sichuan: 10 not sexed spec. (DKCP), "CHINA - NW Sichuan / SERXŮ, 4000 m / REJSEK [legit] 20.vi.1995 [printed]", 1 ♂ (DKCP), "CHINA - NW Sichuan / road Sertar - Darcang / 20 km SSE DARCANG, 4000 m / REJSEK [legit] 15-16.vii.1995 [printed]".

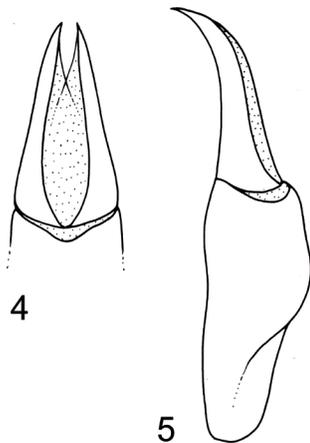
**Description of holotype** (♂). Dorsum (Fig. 1). Total body length 3.5 mm. Oblong oval, moderately convex, except of somewhat lighter extremities entirely black coloured species. Dorsal surface glabrous, shagreened, entirely alutaceous except somewhat shiny fronto-clypeal suture, elytral suture and striae.

Head trapezoidal, slightly convex at middle. Anterior clypeal margin slightly upturned only near anterior angles, broadly sinuate at middle. Anterior angles round, sides nearly straight, only very slightly notched before genae. Genae obtusely round, exceeding distinctly eyes laterad. Clypeal surface widely impressed along almost whole extent of anterior margin, with subobsolete transversal convexity centrally. Fronto-clypeal suture distinct, broadly bisinuate, weakly shiny, tubercles almost missing. Genal suture distinct, weakly shiny. Whole dorsal surface of head impunctate, finely shagreened; clypeus anteriorly weakly granulate.

Pronotum subtrapezoidal, weakly convex, wider than long, widest about at middle, scarcely narrowed anteriorly. Anterior angles slightly projecting anteriorly, broadly round, sides almost straight, slightly divergent to broadly round posterior angles, basis regularly round. Posterior angles and base with complete marginal line. Surface finely shagreened, punctation simple, consisting of remarkably coarse, deeply impressed, almost regularly and densely distributed punctures separated by less than their diameter, punctation becoming somewhat denser to confluent laterally and laterobasally.



Figs 1-3. Habitus of *Agrilinus monikae* sp. nov. 1, 2- male holotype; 3- female allotype; 1- dorsal aspect; 2, 3- ventral aspect.



Figs 4-5. Holotype aedeagus of *Agrilinus monikae* sp. nov. 4- dorsal aspect; 5- left lateral aspect.

Scutellar plate relatively small, triangulate, longer than wide, impunctate, finely shagreened.

Elytra moderately convex, slightly dilated posteriad, widest at approximately posterior third, with ten striae and ten intervals, humeri not denticulate. Striae distinctly impressed, stria punctures distinct, separated approximately by twice their diameter, slightly crenating margins of elytral intervals. Striae 1, 2, 3 and 10 completely developed reaching nearly apex of elytra, stria 3 joining 8 and 9 just before apex, striae 4–7 shortened before apex and stria 4 and 7, and 5 and 6 joining together. Stria 8 and 9 shortened before humerus. Intervals almost flat, impunctate, distinctly shagreened.

Macropterous.

Venter (Fig. 2). Metaventral plate with oval central concavity, shiny, smooth, coarsely

somewhat irregularly punctate, longitudinal furrow absent. Abdominal ventrites alutaceous, finely scabrous, with pale, recumbent macrosetae laterally.

Legs. All femora shiny, impunctate. Protibia regularly widened anteriorly, slender, with three sharp external teeth and row of small external denticles in basal half, ventromedial edge with row of small denticles, two of them at middle weakly more developed. Terminal spur of protibia long, stout, acute apically, inserting against medial external teeth, reaching approximately half of protarsomere 2. Apical margin of two well developed transversal carinae of meso- and metatibia fimbriate with short macrosetae equal in length. Basimesotarsomere equal in length to superior terminal spur, inferior terminal spur acute. Basimetatarsomere equal in length to superior terminal spur and little longer than next two tarsomeres combined. Claws weakly developed, regularly arcuate.

Aedeagus as in Figs 4, 5. Distal part of parameres bent strongly downward, with acute apex.

**Female** (Fig. 3). Total body length 3.3-3.6 mm, allotype 3.5 mm; differs from male as follows: terminal protibial spur slender, metaventral plate almost flat, absent from central concavity.

**Variability.** Total body length 3.3-3.6 mm; some of paratypes somewhat lighter in colour, dark brownish.

**Differential diagnosis.** The newly described species is classified to the closely related species complex of *Agrilinus* Mulsant et Rey, 1870 distributed in eastern and north-eastern parts of the Tibetan plateau (cf. also Mencl & Rakovič 2012). They are *Agrilinus lungaiensis* (Petrovitz, 1962), *A. pseudolungaiensis* Mencl & Rakovič, 2012, *A. surdus* (Boucomont, 1929) and *A. wassuensis* (Petrovitz, 1962). *Agrilinus monikae* sp. nov. differs clearly from all these species mainly by strongly shagreened and thus considerably alutaceous dorsal surface of body; head in both male and female with almost vanishing frontal tubercles; coarsely and densely punctate pronotum; flat and impunctate elytral intervals and by different shape of parameres.

**Distribution.** China: SW Gansu, NW Sichuan, SE Qinghai.

**Collection circumstances.** Specimens from Huashixia (SE Qinghai), Darcang and Serxü (NW Sichuan) were collected buried in soil under droppings of pikas near their burrows. According to the literature available (Smith & Xie 2008) at least five different *Ochotona* Link, 1795 (Mammalia: Lagomorpha) species are known to occur in the distribution area of *Agrilinus monikae* sp. nov., some of them being sympatric. The only specimen from Dogcanglhamo (SW Gansu) was taken from dropping of a marmot in an opening of his burrow. Only the Himalayan Marmot, *Marmota himalayana* (Hodgson, 1841) (Mammalia: Rodentia) is known to occur in these parts of China (Smith & Xie 2008). At Huashixia the new species was collected together with *Qingaphodius ochotonarum* (Král, 1997) (cf. Král 1997).

**Name derivation.** Matronymic, dedicated to Monika, granddaughter of my friend Bohdan Zvarič, a famous coleopterologist and one of the collectors of the new species.

ACKNOWLEDGEMENTS. My cordial thanks go to the following persons: Bohdan Zvarič (Lovosice, CZ), Milan Nikodým (Roztoky u Prahy, CZ) and Jiří Rejsek (Rožďalovice, CZ) submitted material of the new species, Miss

Zuzana Čadová (Liberec, CZ) executed excellent line-drawings and Vladimír Vohralík (Charles University in Prague, CZ) helped with identification of marmots and pikas. Preparation of the paper was supported by institutional resources of the Ministry of Education, Youth and Sports of the Czech Republic for the support of science and research.

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Received: 29.6.2013

Accepted: 10.7.2013

