

**A new species of the genus *Planolinellus* Dellacasa M. & Dellacasa G., 2005
(Scarabaeidae: Aphodiinae) from China**

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Abstract. A new species of the genus *Planolinellus* Dellacasa M. et Dellacasa G., 2005 from China is described and illustrated: *Planolinellus grzegorzi* sp. nov. The new species is most similar to *Planolinellus rufoanalis* (Petrovitz, 1961), comb. nov., which is here additionally illustrated for the first time. The systematic position of both species is discussed.

INTRODUCTION

The original genus *Planolinus* Mulsant et Rey, 1870 was divided into three genera by Dellacasa M. and Dellacasa G. in 2005: *Planolinus* Mulsant et Rey, 1870, *Planolinellus* Dellacasa M. et Dellacasa G., 2005, and *Planolinoides* Dellacasa M. et Dellacasa G., 2005. The two new genera can be distinguished from true *Planolinus* Mulsant et Rey, 1870 by the frontal suture with a median tubercle. All representatives of the genus *Planolinus* Mulsant et Rey, 1870 have the clypeal suture mutic. *Planolinellus rufoanalis* (Petrovitz, 1961), comb. n., and the species newly described here have the clypeal suture with a rather low, poorly visible, but present, median tubercle. Both species have the clypeus distinctly sinuate at middle, which does not match with original diagnosis of *Planolinellus* Dellacasa M. et Dellacasa G., 2005 but the examination of aedeagi of all species from the three genera mentioned here help to solve that problem.

MATERIAL AND METHODS

The specimen was observed with a Nikon SMZ-U stereoscopic microscope. The photos published here were taken by the use of the Canon EOS 5D Mark III connected with Canon MP-E 65mm macro lens. Photographs were edited in Helicon Focus programme.

For morphological terms used in the description I follow by Dellacasa et al. (2001).

All specimens of the new species are indicated by a red, printed label added to the same pin and bearing the status of the specimen, sex, its name, name of the author, month and year of the designation.

Holotype, and 12 paratypes of new species are deposited in private collection of author, 2 paratypes on new species are deposited in Institute of Systematics and Evolution of Animals in Kraków, Poland (ISEA).

Addenda and remarks are found in brackets, separate label lines are indicated by slash (/), separate labels by double slash (//).

DESCRIPTION

Planolinellus grzegorzi sp. nov.

(Figs. 1-3, 6-7, 10, 12)

Type material (15 specimens). Collection of author: Holotype (♂): China / Sichuan pr., 30 km SE Shimian / Near Zhuma vill., 3000 m. / 25.06.2013 / leg. A. Gorodinski [white printed label] // HOLOTYPE (♂) / *Planolinellus / grzegorzi* sp.nov. / det. L. Minkina (11.2015) [red printed label] // Paratype (1 ♂): China / Sichuan pr. 30 km SE Shimian / Near Zhuma vill, 3000 m. / 25.06.2013 / leg. A. Gorodinski [white printed label] // 2290 / dok. L. Mencil [green printed label] // PARATYPE (♂) / *Planolinellus / grzegorzi* sp.nov. / det. L. Minkina (11.2015) [red printed label]. Paratypes (1 ♂; 1 ♀): China / SC Sichuan, Ya'an area / Xiaoxiangling Mts / Shimian - Zhuma v. 2000 m. / 27.06.2014 / leg. V. Patrikeev [white printed label] // PARATYPE (♂ or ♀) / *Planolinellus / grzegorzi* sp.nov. / det. L. Minkina (11.2015) [red printed label]. Paratypes (3 ♂♂; 4 ♀): China / SC Sichuan, Ya'an distr. / Shimian - Zhuma, 3000 m. / 06.07.2013 / leg. V. Patrikeev // PARATYPE (♂ or ♀) / *Planolinellus / grzegorzi* sp.nov. / det. L. Minkina (11.2015) [red printed label]. Paratypes (2 ♂♂; China / SC Sichuan, Ya'an distr. / Shimian - Zhuma, 2800 m. / 06.07.2013 / leg. V. Patrikeev // PARATYPE (♂) / *Planolinellus / grzegorzi* sp.nov. / det. L. Minkina (11.2015) [red printed label]. Collection of ISEA: Paratypes (1 ♂; 1 ♀): China / SC Sichuan, Ya'an distr. / Shimian - Zhuma, 2800 m. / 06.07.2013 / leg. V. Patrikeev // PARATYPE (♂ or ♀) / *Planolinellus / grzegorzi* sp. nov. / det. L. Minkina (11.2015) [red printed label].

Description. Dorsum (Fig. 1). Total body length 4.75 mm. Body elongate, convex, rather strongly shiny, glabrous, except for yellowish paler apex of elytra black.

Head convex, shiny, with a trace of microreticulation. Clypeus moderately broadly bordered, slightly sinuate anteriorly, rounded on sides, notched before genae, with border not setigerous, genae obtusely rounded, protruding from the eyes, with few very short macrosetae. Clypeal suture with one rather low tubercle in the middle; epistome with rather distinct gibbosity. Clypeus distinctly punctate, punctures in front of clypeal suture rather dense and moderately fine, behind of clypeal suture punctures more coarse.

Pronotum transverse, wide, as wide as base of elytra, widest before hind angles, convex, shiny, with very fine microreticulation, with double punctation: larger punctures two to three times larger than smaller ones, both kinds of punctures rather regular, and rather dense. Anterior angles rounded; hind angles obtusely rounded. Sides and basal margin bordered. Anterior margin not bordered.

Scutellum small, triangular, with sides rounded, shiny, with a trace of microreticulation, with few moderately fine, irregularly located punctures.

Elytra elongate, convex, feebly widened posteriorly, shiny, slightly microreticulate, with small, but rather distinct humeral denticles, with ten striae, and ten intervals. First and tenth striae joined together before apex, the rest of striae vague before apex, because apex of elytra is wrinkled, and rather distinctly microreticulate, with rather longitudinally arranged wrinkles (but still shiny). Striae from sixth to eight shortened before elytral base, ninth and tenth striae joined together before base of elytra. Striae distinct, with slightly coarse punctures, distinctly crenating the intervals. Intervals very feebly convex, nearly flat, finely, rather irregularly, sparsely punctured. Before apex elytra with very sparse, extremely short microsetae.

Femora rather shiny, with microreticulation, with rather fine, sparse punctation; all punctures with extremely short macrosetae. Protibiae distinctly tridentate at outer margin; proximally serrulate, upper side smooth, shiny, with few extremely small punctures, with a trace of microreticulation, with elongate, moderately broad, distinctly bent downward, acute apical spur. Meso- and metatibiae with rather strong transverse carinae, apically fimbriate, with short spinules of rather equal length. Metatibiae superior spurs shorter than basal metatarsomere, latter as long as the following three combined. Claws fine, regularly arcuate.

Macropterous.

Venter (Fig. 2). Meso-metaventral plate rather shiny, slightly concave, with indistinct, shallow longitudinal row in the middle, with slightly irregular, rather dense and coarse punctation. Abdominal ventrites rather mat, with rather strong microreticulation, densely, rather finely punctate, in the middle with strip of punctures with short macrosetae, on sides sternites with few punctures with long macrosetae. Pygidium moderately shiny, with microreticulation, densely, slightly coarsely punctured, most punctures with short macrosetae, on sides over a dozen of punctures with very long macrosetae.

Aedeagus (Figs. 6-7) with parameres only slightly shorter than the phallobase, with bifurcated apex. The lower end of bifurcation visible from side, long, distinctly upturned. The upper end of bifurcation visible from above, long, distinctly inwardly turned. Between ends of bifurcation is a membranous, complicated process.

Epipharynx (Fig. 10) transverse, with lateral sides broadly rounded. Corypha with two longitudinal, broad celtes. Prophobae and apophobae with dense, rather long macrosetation. Tormae rather long.

Sexual dimorphism. Males with meso-metaventral plate slightly concave in the middle, females with meso-metaventral plate slightly convex in the middle. Males with tubercle in the middle of clypeal suture distinct, females with indistinct tubercle in the middle of clypeal suture visible as low gibbosity. Males with spur of protibiae more distinctly bent downward.

Variability. Total body length 4.3-4.9 mm. Pronotum nearly entirely black, or sometimes lightened on sides. Elytra from black, black with small yellowish spots at apex to completely brownish with light yellowish spots at apex. Apex of elytra always with microreticulation, more or less distinctly wrinkled. Basal metatarsomere usually as long as or slightly shorter than following three segments combined.

Differential diagnosis. The newly described species can be easily distinguished from other species of genus *Planolinellus* Dellacasa M. et Dellacasa G., 2005 by a combination of features: clypeus slightly sinuate anteriorly, elytra with small but rather distinct humeral denticles, apex of elytra shagreened, and wrinkled with rather longitudinally arranged „wrinkles”, aedeagus with parameres only slightly shorter than the phallobase, with bifurcate apex, and membranous process between bifurcation. Helpful in identification can be photographs given below, comments and key to species proposed in the discussion.

Etymology. The name of the new species is dedicated to my friend Grzegorz Jelonek (Poland).

ADDITIONAL MATERIAL STUDIED

Planolinellus rufoanalis (Petrovitz, 1961)

(Figs. 4, 5, 8, 9, 11, 13)

Material examined: Pakistan sept., Saiful Muluk Lake, Naran, Kaghan Valley, 3100 m., 4-5.07.1985, leg. S. Vit, (author's collection).

Planolinellus vittatus (Say, 1825)

(Fig. 14)

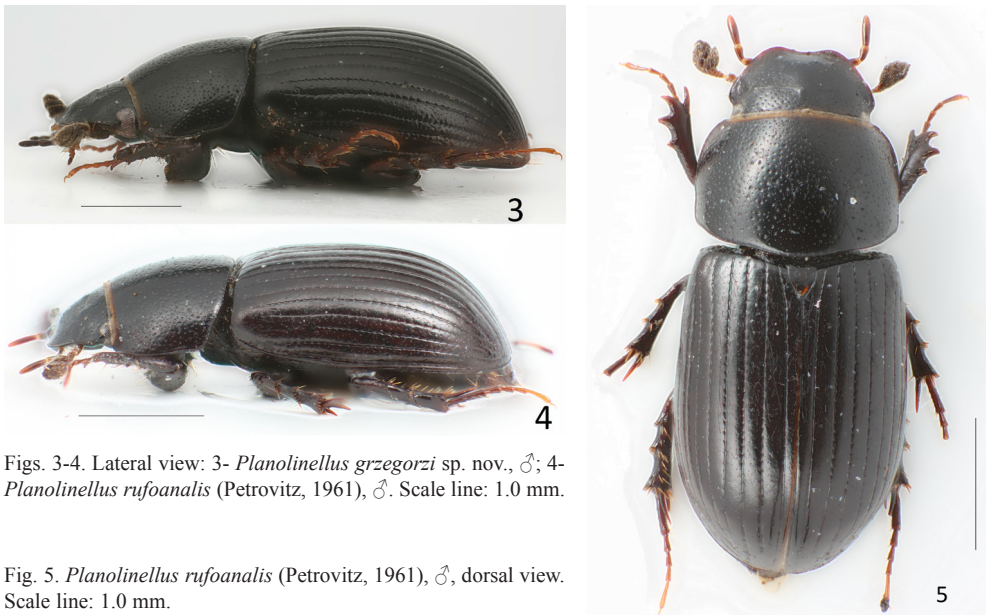
Material examined: Bulgaria UTM FM80, 41°33'47''N / 23°14'09''E, Sandanski, 01.05.2013, leg. L. Minkina, (author's collection).

DISCUSSION

Planolinellus rufoanalis (Petrovitz, 1961), comb. nov. was originally placed in the genus *Agrilinus* Mulsant et Rey, 1861. Petrovitz showed that because of its small size, lack of humeral denticles, lack of distinct tubercles on clypeal suture, shiny apex of elytra, it can be distinguished from all known species of *Agrilinus* Mulsant et Rey, 1861. Dellacasa M. and Dellacasa G. in the Catalogue of Palaearctic Coleoptera transferred *P. rufoanalis* (Petrovitz, 1961) to genus *Planolinus* Mulsant et Rey, 1870 because of the lack of distinct tubercles on clypeal suture. However *P. rufoanalis* (Petrovitz, 1961), as well as *P. grzegorzi* sp. nov. have a low tubercle in the middle of clypeal suture, and because of this, they are different from all members of the genus *Planolinus* Mulsant et Rey, 1870. In comparison to all species of genus *Planolinoides* Dellacasa M. et Dellacasa G., 2005 the tubercle in the middle of clypeal suture is lower. *Planolinellus vittatus* (Say, 1825), as the only member of genus until today, has the tubercle in the middle of the clypeal suture only slightly higher, or similarly elevated, but this species has the clypeus subtruncate, or at least faintly sinuate at middle, which is one of the features in the diagnosis of this genus. Helpful in this case was examination of aedeagus. All members of genus *Planolinus* Mulsant et Rey, 1870 have elongate parameres, longer than the phallobase, and with rather sharply pointed apex (in lateral view), without membranous process. All members of the genus *Planolinoides* Dellacasa M. et Dellacasa G., 2005 have parameres very distinctly shorter than phallobase, obtuse at apex, without membranous process. *Planolinellus vittatus* (Say, 1825) has parameres slightly shorter than phallobase, slightly widened at apex, with small membranous process - its picture (with photos of epipharynx and dorsal view of body) is presented in Gordon and Skelley, 2007. Aedeagus of *P. rufoanalis* (Petrovitz, 1961), and *P. grzegorzi* sp. nov. have the same structure as *P. vittatus* (Say, 1825), additionally, the tubercle on clypeal suture is only slightly lower than in *P. vittatus* (Say, 1825), and because of this, I decided to transfer *P. rufoanalis* (Petrovitz, 1961), and described the new species in genus *Planolinellus* Dellacasa M. et Dellacasa G., 2005. In this case it is necessary to modify the key to genera proposed by Dellacasa M. & Dellacasa G. My proposal is as follows:

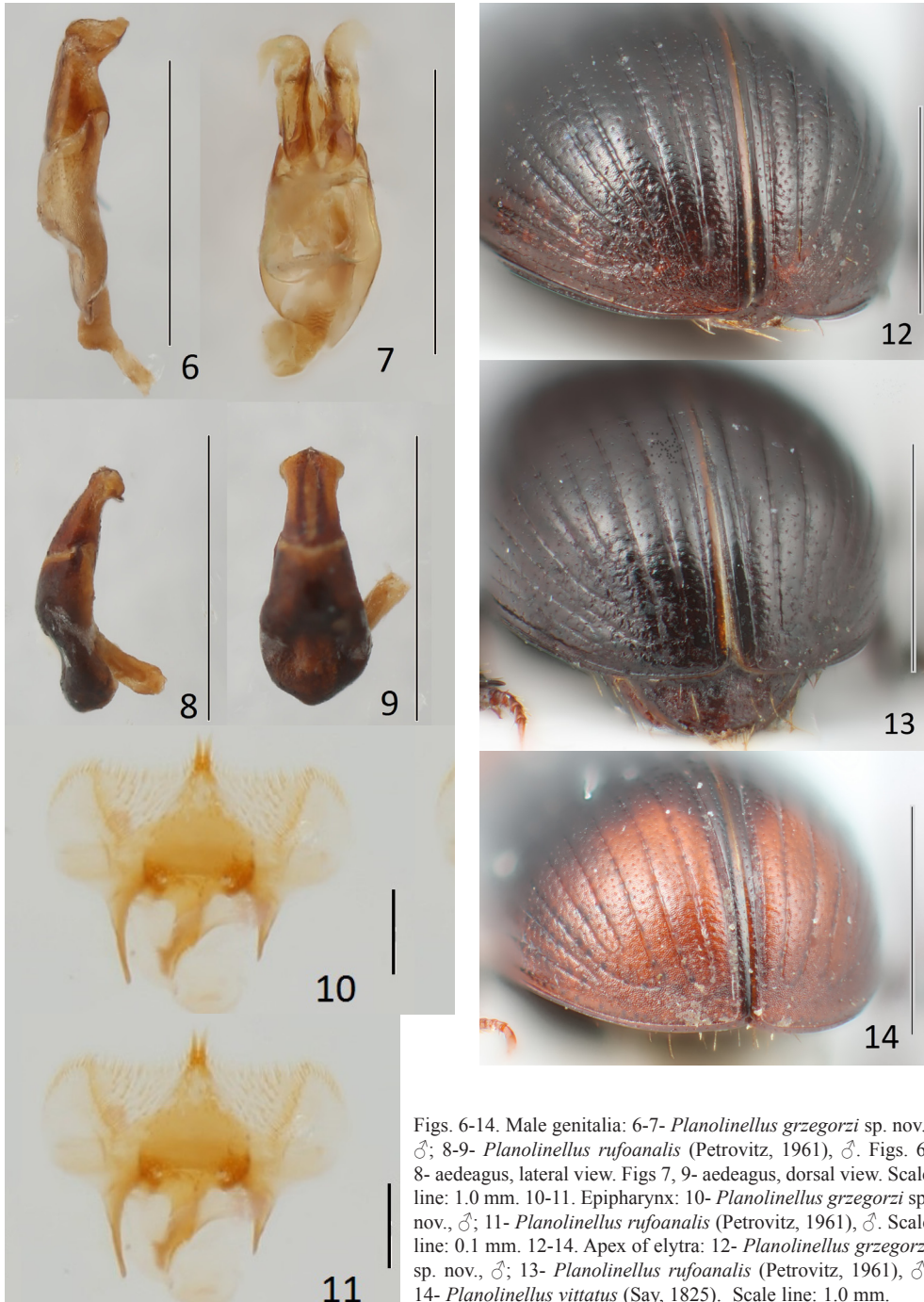


Figs. 1-2. *Planolinellus grzegorzi* sp. nov., ♂: 1- dorsal view; 2- ventral view. Scale line: 1.0 mm.



Figs. 3-4. Lateral view: 3- *Planolinellus grzegorzi* sp. nov., ♂; 4- *Planolinellus rufoanalis* (Petrovitz, 1961), ♂. Scale line: 1.0 mm.

Fig. 5. *Planolinellus rufoanalis* (Petrovitz, 1961), ♂, dorsal view. Scale line: 1.0 mm.



Figs. 6-14. Male genitalia: 6-7- *Planolinellus grzegorzi* sp. nov., ♂; 8-9- *Planolinellus rufoanalis* (Petrovitz, 1961), ♂. Figs. 6, 8- aedeagus, lateral view. Figs 7, 9- aedeagus, dorsal view. Scale line: 1.0 mm. 10-11. Epipharynx: 10- *Planolinellus grzegorzi* sp. nov., ♂; 11- *Planolinellus rufoanalis* (Petrovitz, 1961), ♂. Scale line: 0.1 mm. 12-14. Apex of elytra: 12- *Planolinellus grzegorzi* sp. nov., ♂; 13- *Planolinellus rufoanalis* (Petrovitz, 1961), ♂; 14- *Planolinellus vittatus* (Say, 1825). Scale line: 1.0 mm.

5. Aedeagus with membranous process at apex. Clypeus anteriorly subtruncate to distinctly sinuate at middle. Size maximum 5 mm. *Planolinellus* Dellacasa M. et Dellacasa G., 2005
- 5' Aedeagus without membranous process at apex. Clypeus distinctly sinuate at middle.
..... *Planolinoidea* Dellacasa M. & Dellacasa G., 2005, *Tristaphodius* Balthasar, 1932

P. grzegorzi sp. nov. can be additionally distinguished from *P. rufoanalis* (Petrovitz, 1961) by its larger body (*P. rufoanalis* (Petrovitz, 1961) is less than 4 mm long). *P. grzegorzi* sp. nov. has the most coarse and dense punctation of pronotum in the genus; *P. rufoanalis* (Petrovitz, 1961) has the least coarse and dense punctation of pronotum in the genus. Additionally, I propose the following key to determination of species of genus *Planolinellus* Dellacasa M. et Dellacasa G., 2005:

1. Clypeus anteriorly subtruncate to (rarely) faintly sinuate at middle. Genae slightly protruding from the eyes. Humeral denticles absent. Apex of elytra with strong microreticulation, but not wrinkled or eroded. Microsetation at apex of elytra more or less dense. Aedeagus with paramere at apex with small membranous process. *vittatus* (Say, 1825)
- Clypeus anteriorly faintly to distinctly sinuate at middle. Genae distinctly protruding from the eyes. Humeral denticle small, more or less distinct, but always present. Apex of elytra with more or less distinct microreticulation, slightly eroded or wrinkled. Microsetation at apex of elytra very sparse. Aedeagus with paramere at apex with small or large membranous process. 2
2. Clypeus anteriorly faintly sinuate at middle. Humeral denticle small but distinct. Apex of elytra more or less distinctly wrinkled, with longitudinal „wrinkles”, with more or less distinct microreticulation. Punctuation of pronotum and elytra more dense and more coarse. Aedeagus with paramera at apex with large membranous process. *grzegorzi* sp. nov.
- Clypeus anteriorly distinctly sinuate at middle. Humeral denticle very small, indistinct, but present. Apex of elytra not wrinkled, rather eroded, with indistinct microreticulation. Punctuation of pronotum and elytra less dense and less coarse. Aedeagus with paramere at apex with small membranous process.
..... *rufoanalis* (Petrovitz, 1961)

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