

***Bunbunius quadrihamis* sp. nov.**
from Sichuan province, China
(Coleoptera: Scarabaeidae: Melolonthinae)

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Abstract. *Bunbunius quadrihamis* sp. nov. from Sichuan province in China is described, figured, and an updated key to species of *Bunbunius* Nomura, 1970 is presented. *Bunbunius quadrihamis* sp. nov. is closely related to *B. pseudoopacipennis* Keith, 2008 and *B. prunellus* (Arrow, 1946), from which it differs mainly in the shape of external male genitalia. New records for the species *Bunbunius sinensis* Keith, 2005 (China: Gansu, Shaanxi) are given.

Key words. Coleoptera, Scarabaeidae, Melolonthinae, Rhizotrogini, *Bunbunius*, new species, key to species, Sichuan, China, Palearctic Region

Introduction

The rhizotrogine genus *Bunbunius* Nomura, 1970 was originally proposed as a subgenus of *Pollaplonyx* Waterhouse, 1875 by NOMURA (1970). KEITH (2005) elevated it to generic rank and provided a revision of this genus including a key to species, and subsequently KEITH (2008, 2009) and KEITH & LI (2013) described several additional species. *Bunbunius* differs from *Pollaplonyx* mainly in the shape of the aedeagus, which is broad, V-shaped, with central lobe and one or two pairs of spinules (KEITH 2005).

Currently, the genus *Bunbunius* contains 17 species and two subspecies: *B. abditus* Keith, 2008 from China (Hunan); *B. bicallosifrons* (Frey, 1972) from China (Fujian, Guangdong); *B. csorbai* Keith, 2008 from Nepal; *B. diversifrons* (Fairmaire, 1891) from China (Hubei); *B. gamdoensis* Keith & Li, 2013 from China (Xizang); *B. hangayi* Keith, 2008 from China (Sichuan); *B. hartmanni* Keith, 2009 from Nepal; *B. liukueiensis* (Kobayashi, 1986) from Taiwan; *B. opacipennis* (Nomura, 1970) from Taiwan; *B. privus* Keith, 2005 from China (Guizhou); *B. prunellus* (Arrow, 1946) from Myanmar and China (Yunnan); *B. pseudoopacipennis* Keith, 2008 from Taiwan; *B. puchneri hubeicus* Keith, 2008 from China (Hubei); *B.*

puchneri puchneri Keith, 2008 from China (Gansu, Sichuan); *B. reticulatus* (Murayama, 1941) from South Korea and China (Fujian, Heilongjiang, Hunan, Guandong, Guangxi, Sichuan); *B. rozneri* Keith, 2008 from Thailand; *B. sinensis* Keith, 2005 from China (Gansu, Hubei, Shaaxi) and *B. turnai* Keith, 2008 from China (Sichuan).

Recently I had an opportunity to examine an interesting specimen of *Bunbunius* from China (Sichuan) and, after comparing it with all Chinese material available to me and with the literature (mainly KEITH 2003, 2005, 2008, 2009, KEITH & LI 2013, NOMURA 1970, and SMETANA & KRÁL 2006), I came to the conclusion that it is a new species which is described below.

Material and methods

Specimens were examined with a Novex RZ stereomicroscope; measurements were taken with an ocular grid. Length measurements are from the anterior margin of the clypeus to the apices of the elytra. Habitus photographs were taken using a Canon MP-E 65mm/2.8 1–5× Macro lens on bellows attached to a Canon EOS 550D camera. Partially focused images of each specimen were stacked using the Helicon Focus 3.20.2 Pro software. Exact label data are cited for the material examined. Separate labels are indicated by double slash [/], lines within each label are separated by a slash [/]. Information in quotation marks indicates the original spelling. Author's remarks and additional comments are placed in brackets: [p] – preceding data (in quotation marks) are printed; [h] – the same but handwritten.

The following acronyms identify the collections housing the material examined (the curator's name is in parentheses):

NMPC Národní muzeum, Praha, Czech Republic (Jiří Hájek);
RSCV Richard Sehnal, Velenice, Czech Republic.

New species

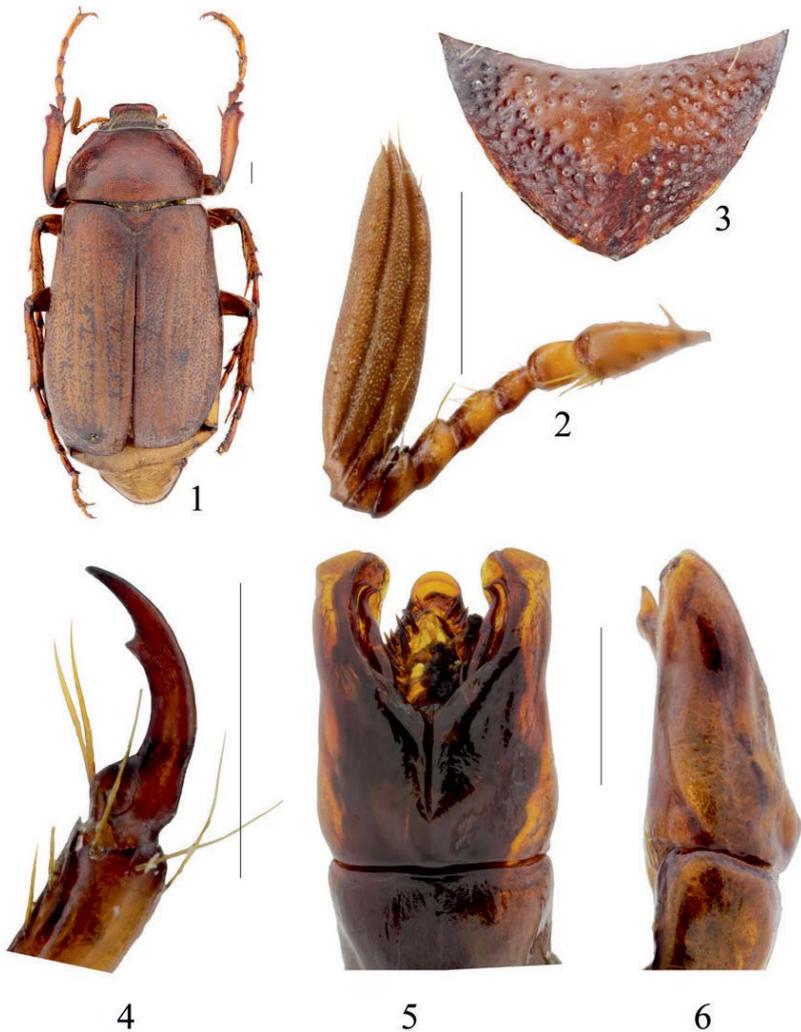
Bunbunius quadrihamis sp. nov.

(Figs 1–6)

Type material. HOLOTYPE: ♂, 'CHINA, Prov. SICHUAN / Strasse zwischen KANDING / und LUDING / Umg. DAHEDOU, 1910 m / leg. A. Puchner 1.–8.VI.2007 [p] // *Bunbunius quadrihamis* sp. n., HOLOTYPE, ♂, Richard Sehnal det. 2013 [p, red label]' (NMPC).

Description of holotype (♂). Body length 17.2 mm. Head, pronotum and abdomen reddish brown, legs partly lighter, elytra pruinose (Fig. 1). Antennae pale brown.

Clypeus distinctly broadly shovel-shaped, strongly punctured, rounded; fronto-clypeal suture upturned and incised. Punctures virtually without interspaces; setation fine, short, yellow and erect, setae issue from anterior thirds of punctures. Labrum bilobed, anterior angles obtuse but distinct. Frons strongly punctured, with shagreened facets between punctures; erect yellow setation longer than on clypeus; macrosetae longest at edge of clypeus and around eye canthus. Eyes normal (large), exceeding genae externally in dorsal aspect; distance between eyes in ventral aspect longer than diameter of eye. Genae rugo-punctate, with group of long macrosetae. Antennae decamerous, antennal club straight and as long as antennal shaft (antennomeres I–VII). Antennomere I as long as antennomeres II and IV



Figs 1–5. *Bunbunius quadrihamis* sp. nov., holotype ♂: 1 – habitus, dorsal view; 2 – antenna, dorsal view; 3 – scutellum, dorsal view; 4 – claw, medial view; 5 – aedeagus, dorsal view; 6 – aedeagus, lateral view. Scale bar: 1.0 mm.

combined, antennomeres VI and VII with drop-shaped caruncula (Fig. 2), long macrosetae, club totally densely punctate, without smooth areas. Terminal maxillary palpomere elongate, longer than palpomeres 2 and 3 combined, widened in middle, apex obliquely angular and concave through much of surface, oval alutaceous area tapering toward apex.

Pronotum weakly convex, approximately heptagonal, 1.6 times wider than long, broadest approximately in posterior third, with very finely impressed medial line; glabrous except on lateral margins. Anterior and posterior angles rounded but posterior poorly defined. Surface

without macro- and microsetae. Dense punctation consisting of punctures of equal size, with glossy facets in between as large as punctures themselves. Disc with a small impunctate facet. Anterior halves of lateral margins finely crenulate, with long, yellowish-brown macrosetae issuing from crenulations.

Scutellar shield wider than long, triangular; without macrosetae, with punctures of two sizes grouped into two mutually separate areas (Fig. 3).

Elytra moderately convex, slightly dilated posteriorly. Elytral disc, sides and lateral margin rugately striate, without setation. Punctures only in rugae, often set in longitudinal rows.

Macropterous.

Legs. All femora shiny, slightly and irregularly punctate. Protibia tridentate, claws gently curved and rugate throughout length, each with a distinct small tooth in proximal third (Fig. 4). Mesotibiae and metatibiae expanded distally, with two longitudinal carinae internally; distal edge with row of long macrosetae of equal length, terminal calcars stout, long, lower calcar shorter than upper, upper calcar longer than first metatarsomere.

Abdominal sternites ochre brown, with fine, short, recumbent, white macrosetae. Sternites glossy, finely punctate. Pygidium concave, rugately striate, on margins with short, semierect macrosetae.

Male genitalia (Figs 5–6). Aedeagus symmetrical, central lobe conical, apex widely rounded. Two pairs of long, narrow, undulate spinules terminate in medially curved hooks.

Female. Unknown.

Differential diagnosis. Habitually, *Bunbunius quadrihamis* sp. nov. is close to *B. pseudoopacipennis* and *B. prunellus*. These three species differ in antennal proportions, pronotal morphology, shape of the aedeagus and distribution. The new species has the antennal club as long as antennomeres I–VII, *B. pseudoopacipennis* has the male club as long as the funicle, and *B. prunellus* has the male club as long as the scape and funicle combined. The new species has the medial lobe of the aedeagus conical with apex widely rounded, *B. pseudoopacipennis* has the medial lobe triangular with apex sharp and spinules blunt, and *B. prunellus* has the medial lobe triangular with both apex and spinules sharp. *Bunbunius quadrihamis* sp. nov. is known from China (Sichuan), *B. pseudoopacipennis* from Taiwan and *B. prunellus* from Myanmar and China (Yunnan).

Etymology. From Latin *quadri* (= four) and *hamis* (= hook-shaped), referring to spinules extending from the endophallus and parameres.

Geographical distribution. China (Sichuan).

Faunistic notes on other *Bunbunius* species

Bunbunius sinensis Keith, 2005

Material studied. CHINA: SHAANXI: 'CHINA, SHAANXI, QINGLING / Mts. TAIBAI SHAN Mts. 1500- / -2000 m. Houzheni vil. 33°52N- / 107°44E, IV.- V.2000: A. Plutenko [p]', 10 ♂♂ and 5 ♀♀ (RSCV). GANSU: 'China, S Gansu / Wangziguan, E Wudu. / 26.-30.05.97. h=2000 m / leg. S. Murzin [p]', 4 ♂♂ in RSCV.

Note. To date, the species was known only from the type series. Specimens from southern Gansu, Wangziguan village, represent additional material collected at the type locality. The species is recorded here for the first time for the Shaanxi province, China.

***Bunbunius reticulatus* (Murayama, 1941)**

Material studied. CHINA: FUJIAN: 'KUANTUNG, FUKIEN / China [p] 7.5 [hw] 46 [p] / (TSCHUNG SEN.) [p]', 1 ♂ in NMPC (Balthasar's collection); 'Kuatun (2300m) 27,40n.Br. / 117,40ö.L. - J.Klapperich / 21. 4. 1938 (FUKIEN) [p, violet label]', 1 ♂ in NMPC (Balthasar's collection) and 1 ♂ in RSCV.

Note. The species was originally described from 'île de Quelpart' (= Cheju-do, an island off the southern coast of South Korea). Later on, it was recorded from the whole Korean Peninsula (KIM 2000, 2001; STEBNICKA 1980) and from Fujian province, China (KEITH 2008).

Updated key to males of *Bunbunius*

Note. The key is modified from KEITH (2008). *Bunbunius bicallosifrons* and *B. diversifrons* are omitted, because they are known from females only.

- 1 (2) Antennal club 4-segmented, first segment abbreviated and one-third as long as the following. Nepal. ***B. csorbai*** Keith, 2008
- 2 (1) Antennal club 3-segmented.
- 3 (6) Aedeagus without a central lobe, its apex flattened, spatulate and deflexed.
- 4 (5) Clypeus with lateral margins diverging at base, then very widely rounded towards straight anterior margin; lateral margins of pronotum feebly crenulated; meso- and metatibiae each with a single transverse and entire carina. Pronotum and scutellum dark blackish brown. China (Hunan). ***B. abditus*** Keith, 2008
- 5 (4) Clypeus with lateral margins diverging at base, then very widely rounded towards feebly bilobate anterior margin; lateral margins of pronotum broadly crenulated; meso- and metatibiae each with one transverse and entire carina and another incomplete carina. Pronotum and scutellum dark reddish brown. Taiwan.
..... ***B. liukueinsis*** (Kobayashi, 1986)
- 6 (3) Aedeagus with central lobe.
- 7 (26) Aedeagus with 2 pairs of spinules in dorsal notch.
- 8 (9) Medial lobe of aedeagus conical, wide, not tapering near widely rounded apex. Elytra pruinose. China (Sichuan). ***B. quadrihamis*** sp. nov.
- 9 (8) Medial lobe of aedeagus triangular or elongate.
- 10 (15) Medial lobe of aedeagus triangular, sometimes narrow, apex sharp.
- 11 (14) Elytra pruinose.
- 12 (13) Male antennal club as long as funicle; anterior margin of clypeus barely excised; maxillary palp with second segment 1.5× longer than terminal segment; accessory tooth of metatarsal claw parallel with apical tooth. Spinules in dorsal notch of aedeagus with apices blunt, central lobe set in a wide triangle; basal areas of endophallus with larger and fewer spinules. Taiwan. ***B. pseudoopacipennis*** Keith, 2008
- 13 (12) Male antennal club as long as scape and funicle combined; anterior margin of clypeus briefly but clearly excised; maxillary palp with second segment hardly half as long as terminal segment; metatarsal claw with an oblique tooth located medially. Spinules in dorsal notch of aedeagus with apices sharp, central lobe set in a narrow triangle with a central carina. Myanmar, China (Yunnan). ***B. prunellus*** (Arrow, 1946)

- 14 (11) Elytra shiny; male antennal club as long as funicle; anterior margin of clypeus barely excised; maxillary palp with second segment 1.5× longer than terminal segment; accessory tooth of metatarsal claw parallel with apical tooth. Spinules in dorsal notch of aedeagus with apices blunt, central lobe set in a wide triangle; basal areas of endophallus with numerous smaller spicules. Korean Peninsula, south-eastern continental China. *B. reticulatus* (Murayama, 1941)
- 15 (10) Medial lobe of aedeagus elongate, with rounded apex (in case of doubt, follow thesis 10).
- 16 (19) Pronotum very densely punctate at base, punctures nearly confluent.
- 17 (18) Body dark brownish, elytra distinctly pruinose. Maxillary palp with terminal segment elongated, basal segment shorter. Abdomen of male not visibly flattened along middle. China (Gansu, Sichuan). *B. puchneri puchneri* Keith, 2008
- 18 (17) Body light yellowish brown, not pruinose. Maxillary palp with terminal segment enlarged, basal segment longer. Abdomen of male flattened along middle. China (Hubei). *B. puchneri hubeicus* Keith, 2008
- 19 (16) Pronotum with punctures separated by at least one-half of puncture diameter.
- 20 (23) Medial lobe of aedeagus parallel-sided, not visibly tapering near apex. Posterior angles of pronotum obtuse. Elytra not pruinose.
- 21 (22) Antennal club shorter, entire pronotum punctate. China (Shaanxi, Hubei, Gansu). *B. sinensis* Keith, 2005
- 22 (21) Antennal club longer, pronotum with 3 impunctate facets. China (Xizang). *B. gamdoensis* Keith & Li, 2013
- 23 (20) Medial lobe of aedeagus tapering near apex.
- 24 (25) Overall size larger. Posterior angles of pronotum obtuse. Clypeus not emarginated at middle. China (Sichuan). *B. hangayi* Keith, 2008
- 25 (24) Overall size smaller. Elytra pruinose. Posterior angles of pronotum nearly straight. Clypeus narrowly emarginate at middle. China (Sichuan). ... *B. turnai* Keith, 2008
- 26 (7) Aedeagus with one pair of spinules in dorsal notch.
- 27 (30) Aedeagus short, with parameres curved.
- 28 (29) Spinules short and curved, placed laterally. Central lobe wide at base. Bicolored, forebody blackish, elytra pruinose, dark brown. Pronotum very densely punctate, punctures ordered in series. China (Guizhou). *B. privus* Keith, 2005
- 29 (28) Two strong spinules and apex extended. Nepal. *B. hartmanni* Keith, 2009
- 30 (27) Aedeagus long, with parameres straight. Spinules long, straight, placed medially. Central lobe very narrow. Body dark brown, forebody somewhat darker. Pronotum less densely and evenly punctate. Taiwan. *B. opacipennis* (Nomura, 1970)

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