

**Contribution to knowledge of *Cosmiomorpha* (*Microcosmiomorpha*) Mikšič, 1977  
(Coleoptera: Scarabaeidae: Cetoniinae: Goliathini)  
with descriptions of three new species**

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**Taxonomy, new species, Coleoptera, Scarabaeidae, Cetoniinae, Goliathini, *Cosmiomorpha*, *Microcosmiomorpha*, China, Vietnam, Laos**

**Abstract.** Three new species in the goliathine genus *Cosmiomorpha* subgenus *Microcosmiomorpha* Mikšič, 1977 are described as follows: *Cosmiomorpha* (*Microcosmiomorpha*) *schneideri* sp. nov. is described from Sichuan province in China, *Cosmiomorpha* (*Microcosmiomorpha*) *pacholatko*i sp. nov. from Northern Vietnam and *Cosmiomorpha* (*Microcosmiomorpha*) *tricostata* sp. nov. from Northern Laos. Dorsal habitus, ventral habitus and male genitalia of all three new species are illustrated. All the three new species are compared with other known species.

## INTRODUCTION

The Goliathine genus *Cosmiomorpha* was described by Saunders in 1852. It was Mikšič (1977), who separated genus into two different subgenera. Based on the structure of protarsi, shape of pronotum and mesometasternal process, the author separated mainly small species to establish the subgenus *Microcosmiomorpha*. *Cosmiomorpha setulosa* Westwood, 1854 became the type species of new subgenus.

Only four species are recently accommodated in the subgenus, three species known from Taiwan and Japan, one species from mainland China and Northern Vietnam. The present paper deals with populations of *Microcosmiomorpha* Mikšič, 1977 flying across central and southern provinces of mainland China and populations occurring in Northern Vietnam and Northern Laos. From these areas, only *Microcosmiomorpha setulosa* and its two geographical subspecies are known at the moment. After the examination of some recent catches of *Microcosmiomorpha* from mainland Asia I found three still undescribed taxa, which will be described below.

It was only Mikšič (1974, 1977) who contributed to knowledge of *Microcosmiomorpha* during last few decades. Some other publications are only partially useful: Medvedev (1964), Ma (1995), Sakai & Nagai (1998), Krajčák (1998), Smetana (2006), usually provide photographs of insects or list particular species.

Taxonomical position of *Microcosmiomorpha setulosa* Westwood, 1854 and its two geographical subspecies stays unclear at the moment. It is very probable that all the three taxa are different species, but as I was not able to examine the type of *Cosmiomorpha* (*Microcosmiomorpha*) *setulosa* ssp. *intermedia* Mikšič, 1974, I prefer to leave this task for the future, possibly for revisers of the group.

## MATERIAL AND METHODS

The following codens of institutional and private collections are used in the text:

MNHN Muséum national d'Histoire naturelle, Paris, France;

OUMNH Oxford University Museum of Natural History, Oxford, United Kingdom;

SJCP Stanislav Jákl, private collection, Praha, Czech Republic.

Specimens of the newly described species are provided with one printed, red label for HOLOTYPUS or yellow label for PARATYPUS, sex symbol and St. Jákl det. 2014. Exact label data are cited for the material examined, individual labels are indicated by a double slash (//), individual lines of every label by a single slash (/).

The following specimens were compared with the newly described species: *Cosmiomorpha (Microcosmiomorpha) setulosa* Westwood, 1854 TYPUS (OUMNH), (Figs 19-24), *Cosmiomorpha (Microcosmiomorpha) setulosa* ssp. *cribellata* Fairmaire, 1893 TYPUS (MNHN), (Figs 25-30), *Cosmiomorpha (Microcosmiomorpha) setulosa* ssp. *intermedia* Mikšič, 1974 12m, 15f (SJCP), *Cosmiomorpha (Microcosmiomorpha) setulosa* ssp. *cribellata* 25 m, 32f (SJCP). Type material of the newly described species is deposited in author's collection and Muséum national d'Histoire naturelle, Paris, France.

## TAXONOMY

### *Cosmiomorpha (Microcosmiomorpha) schneideri* sp. nov.

(Figs 1-8)

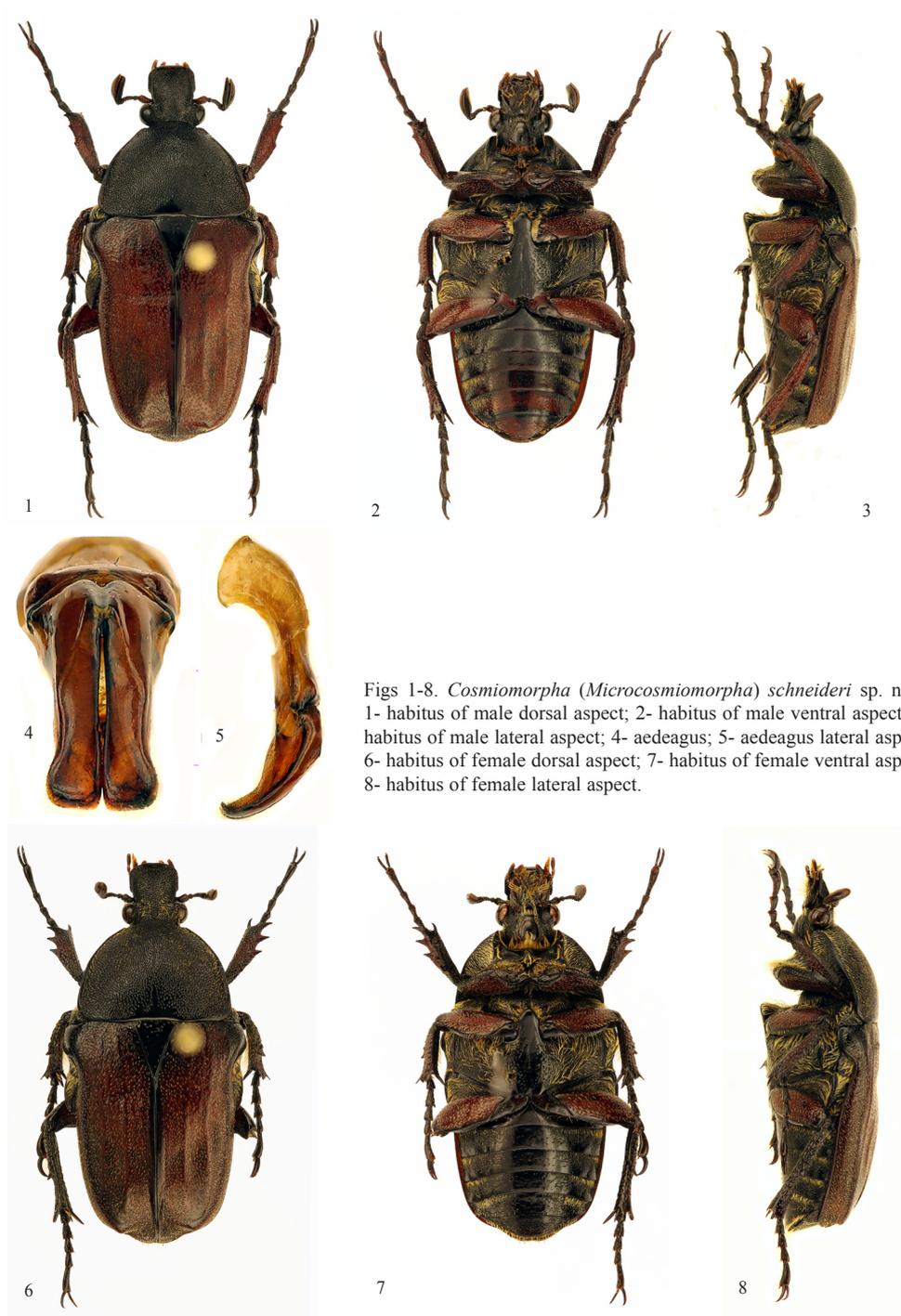
**Type locality.** China, Sichuan Province, Gongga Mt., Hailougou Glacier Park, Moxi vill env.

**Type material.** Holotype (♂) labelled: CHINA, Sichuan prov./ Moxi vill.env., 40 km S of Luding/ Hailougou Glacier Park, Gongga Mt./ 14.-20.viii.1995, 2000-3200 m / J. Schneider lgt. Paratypes: (No. 1 ♂ labelled): C CHINA, W Sichuan/ LUDING XIAN, MOXI/ 9.-14.vii.1999/ Dr. V. Beneš lgt.; (No. 2 ♂) labelled: CHINA, Sichuan, 10.vii.1995/ Luding env./ cca 30 km SEE of Kangding/ 30°00 N 102°20 E/ M. Trýzna et O. Šafránek lgt.; (No. 3 ♀) labelled: CHINA: Sichuan, Moxi/ 29 13 N 102 10 E, 1500 m/ 2.vii.1998, J. Schneider/ 1998 China Expedition/ J. Farkač, D. Král/ J. Schneider/ A. Smetana//; (No. 4 ♂) labelled: Thibet/ Yerkalo/ MSr. P. Biet (MNHN); (No. 5 ♂) labelled: Thibet/ Chasseurs de/ Ta-tsien-lou (MNHN); (No. 6 ♂) labelled: Chasseurs Thibétains/ 1899 (MNHN).

**Description of holotype.** Body bicoloured with black head and pronotum and brownish elytra. Elongated with mild lustre. Length (excluding pygidium) 17.8 mm, maximum humeral length 8.2 mm.

**Head.** Black, densely punctate, almost parallel. Frons and clypeus with same density of granulation. Lateral declivities visible throughout total length of clypeus, parallel. Apex of clypeus vertically elevated, apical margin gently rounded. Antennae black to brown, medially long. First antennomere reddish, other dark brown to black. Length of pedicle and stalk approximately same.

**Pronotum.** Completely black, narrowing to the apex, in anterior half more sharply. Punctuation dense, except of mid part of basal margin, which is glabrous. Density of punctuation very high, punctures diameters longitudinally shaped with very narrow interspaces. Laterally bordered, border almost reaching anterolateral margins. Short, yellowish setation present only near lateral margins. Basal margin straight, unbordered.



Figs 1-8. *Cosmiomorpha (Microcosmiomorpha) schneideri* sp. nov.: 1- habitus of male dorsal aspect; 2- habitus of male ventral aspect; 3- habitus of male lateral aspect; 4- aedeagus; 5- aedeagus lateral aspect; 6- habitus of female dorsal aspect; 7- habitus of female ventral aspect; 8- habitus of female lateral aspect.

Scutellum. Black, triangular, shining. Glabrous, except of few fine, simple punctures near base.

Elytra. Colouration reddish to brown, sutural ridge darker. Punctuation horse shoe shaped, regularly distributed throughout total length. Lateral margins striolate. Disc with two, very low, almost indistinctly developed ribs, which are not completely glabrous - some parts with punctures. Subhumeral emargination sharply developed. Humeral and apical calli indistinctly developed. Sutural ridge glabrous, in posterior half lowly elevated. Elytron apex rounded, protrusion of sutural ridge very short. Yellowish setation very short and fine, only present in its lateral sides.

Pygidium. Semicircular, black, granulate, bearing fine, yellowish setation.

Ventrum. Abdomen brown to black, other parts black. Abdomen with fine and simple punctuation, laterally each segment bears yellowish setation. Medial furrow shallow, but rather wide. Metasternum with glabrous disc, laterally with dense granulation. Yellow setation longer than in abdomen. Mesometasternal process with mid line and simple, fine punctuation. Apex of mesometasternal process rounded, slightly protruding. Prosternum and mentum granulate, setation shorter.

Legs. Elongate as in other representatives of group. Coxae, femora and tibiae reddish to light brown. Tarsi black. Protibia tridentate, distance between anterior and middle teeth approximately two times shorter than between posterior and middle ones. Meso- and metatibia with obtuse carina in its posterior half. Inner parts of meso- and metatibia with yellow setation.

Genitalia. Parameres laterally running like in *C. setulosa*, but with wide, differently shaped apex (Figs 4-5).

**Variability.** Size range 16.0-16.8 mm. Setation of head, pronotum and elytra more abundant, including whole surface of elytra and pronotum. Apical margin of clypeus not rounded, but with shallow emargination. Tibia black to dark brown. In other aspects similar to holotype male.

**Sexual dimorphism.** Length of a single available female 17.0 mm. Punctuation similar to males, setation also short and fine. Colouration similar to males. Abdomen arched. Protibia wider, more robust, shorter, tridentate. Distances between protibia teeth approximately same. Apical margin of clypeus shallowly emarginate.

**Differential diagnosis.** Similar to *C. setulosa* ssp. *intermedia* Mikšič, 1974. The newly described species differs from it mainly by its very different shape of male parameres termination, which is wide, almost with lobe (Figs 4-5), but parallel throughout total length in *C. setulosa* ssp. *intermedia*. Beside this, elytra colouration in the new species is reddish to brown, but usually black in *C. setulosa* ssp. *intermedia*, elytra punctuation of *C. setulosa* ssp. *intermedia* is much denser than in *C. schneideri*, lateral declivity of head more parallel in *C. schneideri*, but narrowing to apex (semioval) in *C. setulosa* ssp. *intermedia*.

**Etymology.** Named after my friend Jan Schneider (Praha, Czech Republic), famous specialist in Silphidae and Geotrupidae beetles, who collected the holotype specimen.

**Distribution.** China, Sichuan Province.

***Cosmiomorpha (Microcosmiomorpha) tricostata* sp. nov.**

(Figs 9-13)

**Type locality.** Laos, N Louang Phrabang Prov., Thong Khan.

**Type material.** Holotype (♂) labelled: Laos, N Louangphrabang/ 11.-21.v.2002, Thong Khan/ Vít Kubáň lgt, 750m.

**Description of holotype.** Body black to dark brown, with three developed ribs on elytra, total length (excluding pygidium) 15.7 mm, maximum humeral width 8.7 mm.

**Head.** Black with densely developed punctation throughout total length. Lateral carina of clypeus developed, but very obtuse. Lateral declivity semioval. Frons with long, beige setation. Apex of clypeus almost vertically elevated, apical margin with shallow emargination. Antennae medially long, club brownish, stalk black. Length of club and stalk approximately same.

**Pronotum.** Completely black, from base narrowing rather sharply to apex. Punctation very dense. Disc with dense, longitudinal punctures and very narrow interspaces. Sides with dense, more or less longitudinal striolation. Sides bordered. Setation absent.

**Scutellum.** Colouration black, shining, triangular. Simple, but rather large and deep punctures present throughout total length.

**Elytra.** Dark brown, base blackish. Generally wider and shorter than in other representatives of subgenus. Each elytron with three glabrous, elevated ribs (including lateral rib). Punctation of interspaces dense, horse shoe shaped. Lateral sides transversally striolate. Sutural ridge blackish, its posterior half obtusely elevated. Termination of sutural ridge also obtuse, slightly protruding over elytra apex. Humeral calli absent, apical calli developed, glabrous. Elytra apex rounded. Very fine, thin, yellowish setation present, especially in posterior half and sides.

**Pygidium.** Dark brown, semioval. Whole surface granulate, bearing short yellowish setation.

**Ventrum.** Abdomen dark brown to black. Sides with horizontally developed wrinkles, each segment bearing yellowish setation in its anterior margin. Medial furrow rather reduced, but very shallowly present. Metasternum black, except of narrow mid part granulate and almost completely covered with long beige to yellow long setation. Mesometasternal process small, apex obtusely rounded, slightly protruding. Prosternum and mentum densely granulate or striolate.

**Legs.** Coxae, femora, tibia and tarsi black. Protibia tridentate. Meso- and metatibia carinate, bearing ginger setation at inner side.

**Genitalia.** Shorter and wider than other species of the group. Parameres running parallel, shortly narrowing in front of apex (Figs 12-13)

**Variability and sexual dimorphism.** Only holotype male is known.

**Differential diagnosis.** *Cosmiomorpha (Microcosmiomorpha) tricostata* sp. nov. stays close to *C. setulosa* ssp. *cribellata* Fairmaire, 1893 and can be distinguished by several characters as follows:



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Figs 9-13. *Cosmiomorpha* (*Microcosmiomorpha*) *tricostata* sp. nov.: 9- habitus dorsal aspect; 10- habitus ventral aspect; 11- habitus lateral aspect; 12- aedeagus; 13- aedeagus lateral aspect.

I. elytra with three elevated and distinctly developed costae in the new species, but with two indistinctly developed costae in *C. setulosa* ssp. *cribellata*;

II. general shape of body in the new species shorter and wider than in *C. setulosa* ssp. *cribellata*;

III. pronotal punctation in the newly described species combined of longitudinally shaped punctures at disc and longitudinally running striolation at sides, but without any lateral striolation in *C. setulosa* ssp. *cribellata*;

IV. frons with long setation, elytra with short, yellowish setation in the newly described species, but glabrous dorsum in *C. setulosa* ssp. *cribellata*;

V. male parameres in *C. tricostata* sp. nov. (Figs 12-13) wider, shorter and its apex narrowing, but longer and narrow parameres with parallel apex in *C. setulosa* ssp. *cribellata*.

**Etymology.** Named after one of characters of the new species, three distinctly developed ribs on elytra.

**Distribution.** N Laos, Luang Phrabang Prov.

***Cosmiomorpha (Microcosmiomorpha) pacholatkoii* sp. nov.**

(Figs 14-18)

**Type locality.** N Vietnam, 70 km NW of Hanoi, Tam Dao.

**Type material.** Holotype (♂) labelled: N Vietnam, 21 27 N, 105 39 E/ 70 km NW of Hanoi, Tam Dao/ 1.-8.vi.1996, 900-1200 m/ Pacholátko & Dembický leg.

**Description of holotype.** Large species, length (excluding pygidium) 19.3 mm, maximum humeral length 9.2 mm. Dark brown to black with abundant ginger setation.

Head. Black with very dense punctation of frons and rough granulation of clypeus. Completely covered with dense and long ginger setation. Lateral border of clypeus rather low, lateral declivity present, semioval. Apical margin of clypeus vertically elevated and slightly turned backwards. Mid of apical margin straight. Antennae brownish, length of club and stalk approximately same.

Pronotum. Colouration black, punctation very dense. Diameters of punctures more or less longitudinally shaped, interspaces very narrow. Except of middle part of basal margin completely covered with rather long, ginger setation. Lateral sides bordered, in front of anterolateral margins with shallow emargination.

Scutellum. Brown, shining, almost glabrous. Few simple punctures bear ginger setae.

Elytra. Brown with two obtuse, glabrous, impunctate ribs on each elytron. The rest of surface (except of sutural ridge) completely covered with ginger, dense setation. Punctation of interspaces dense, horse shoe shaped. Lateral sides with horizontal wrinklation to granulation. Humeral and apical calli very obtuse. Sutural ridge flat, impunctate, shining. Protrusion of sutural ridge not developed.

Pygidium. Pygidium flat, semioval. Its colouration brownish, whole surface granulate and bearing ginger setation.

Venter. Colouration completely brownish. Abdomen with distinctly developed middle furrow. Sides of abdomen punctured, each segment laterally with ginger setation. Middle part of metasternum only with few simple punctures, sides densely wrinkled, covered with abundant, ginger setation. Mesometasternal process narrower than in other species, from base gently narrowing to apex, apical part slightly heading downwards. Prosternum and mentum wrinkled, with abundant, ginger setation.



Figs 14-18. *Cosmiomorpha (Microcosmiomorpha) pacholatkoii* sp. nov.: 14- habitus dorsal aspect; 15- habitus ventral aspect; 16- habitus lateral aspect; 17- aedeagus; 18- aedeagus lateral aspect.

Legs. Elongate as other representatives of the group. Coxae, femora, tibiae dark brown, tarsi dark brown to black. Protarsi tridentate, both posterior teeth very obtuse. Meso- and metatibiae carinate, bearing ginger setation.

Genitalia. Structure of male parameres more complicate than in other representatives (Figs 17-18).

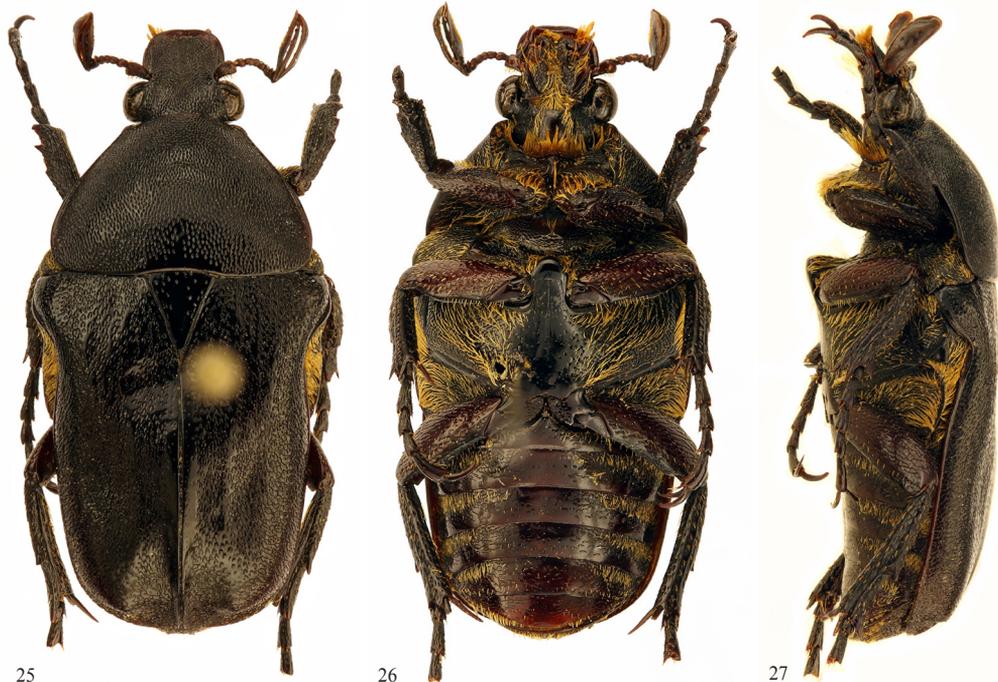
**Variability and sexual dimorphism.** Hitherto only holotype male is known.

**Differential diagnosis.** Combination of big size, very abundant setation of dorsum and



Figs 19-24. *Cosmiomorpha (Microcosmiomorpha) setulosa* Westwood, 1854: 19- habitus dorsal aspect; 20- habitus ventral aspect; 21- habitus lateral aspect; 22- aedeagus; 23- aedeagus lateral aspect; 24- labels.

ventrum, differently shaped mesometasternal process, emargination of anterolateral margin of pronotum and unique shape of male parameres (Figs 17-18) differ *Cosmiomorpha (Microcosmiomorpha) pacholatkoii* sp. nov. from all the other representatives of the group.



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TYPE

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MUSEUM PARIS

Collection Léon Fairmaire  
1906

*Cosmiomorpha*  
*cribellata*  
Fairm. 1893  
Tonkin

Holotypus!

*Cosmiomorpha*  
*cribellata* Fairm. 1893  
(= *tonkinensis* Moser 1894)  
H. Schein 1985.

Figs 25-30. *Cosmiomorpha* (*Microcosmiomorpha*) *setulosa* ssp. *cribellata* Fairmaire, 1893: 25- habitus dorsal aspect; 26- habitus ventral aspect; 27- habitus lateral aspect; 28- aedeagus; 29- aedeagus lateral aspect; 30- labels.

**Etymology.** Named after my friend Petr Pacholátko (Brno, Czech Republic), who collected the holotype specimen.

**Distribution.** N Vietnam, Tam Dao.

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