Cosmiomorpha (*Microcosmiomorpha*) *tonkinensis* Moser, 1903 - a valid species from Northern Vietnam (Coleoptera: Scarabaeidae: Cetoniinae)

Stanislav JÁKL

Geologická 1218, Praha 5, 158 00, Czech Republic
e-mail: stanley.jakl@seznam.cz

Taxonomy, Lectotype, Paralectotypes, Coleoptera, Cetoniinae, *Cosmiomorpha, Microcosmiomorpha*, Vietnam, checklist

Abstract. A study of the type specimens of *Cosmiomorpha tonkinensis* Moser, 1903 a species previously synonymised with *C. setulosa cribellata* Fairmaire, 1893, revealed that syntypes belong in fact to two different species: *C. setulosa cribellata* and another, currently unrecognised species. Therefore, to fix the identity of *C. tonkinensis*, the lectotype is designated and *Cosmiomorpha* (*Microsomiomorpha*) *tonkinensis* is established as a valid species. Habitus and male genitalia of both species are pictured and their diagnosis is provided. Updated list of all *Microcosmiomorpha* Mikšič, 1977 species is provided.

INTRODUCTION

The oriental goliathine genus *Cosmiomorpha* Saunders, 1852 is recently divided into two subgenera. Larger species with elongate protibia are accomodated in the nominotypical subgenus, smaller species with normally developed male protibia belong to *Microcosmiomorpha* Mikšič, 1977. The type species of *Microcosmiomorpha* is *Cosmiomorpha setulosa* Westwood, 1854. Not much has been published about *Microcosmiomorpha* since Mikšič's time (Mikšič, 1974, 1977). Some partial information can be found in (Masumoto & Sakai, 1988), (Sakai & Nagai, 1998) and (Smetana, 2006). During my last study of the genus (Jákl, 2014) I noticed that the population of *Microcosmiomorpha* from northern parts of Vietnam usually includes two very similar, but different species. Those insects used to be identified as *Cosmiomorpha* (*Microcosmiomorpha*) *setulosa cribellata* Fairmaire, 1893. Examination of six syntype specimens of *Cosmiomorpha tonkinensis* Moser, 1903 revealed that both species are included in the type series, one of them identical with *Cosmiomorpha cribellata*, which was confirmed with the study of the Fairmaire's type. To solve this taxonomical problem, I choose one specimen of "the other" species as the lectotype of *C. tonkinensis* and establish *Cosmiomorpha* (*Microcosmiomorpha*) *tonkinensis* as a valid species, cohabiting with *Cosmiomorpha* (*Microcosmiomorpha*) *setulosa cribellata* in northern Vietnam.

MATERIAL AND METHODS

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 (/). Lectotype and paralectotype specimens are provided with red printed labels with the text: "Lectotype" or "Paralectotype" respectively, "sex symbol" / "Cosmiomorpha (Microcosmiomorpha)" / "tonkinensis Moser, 1903 / "St.Jákl des. 2015".

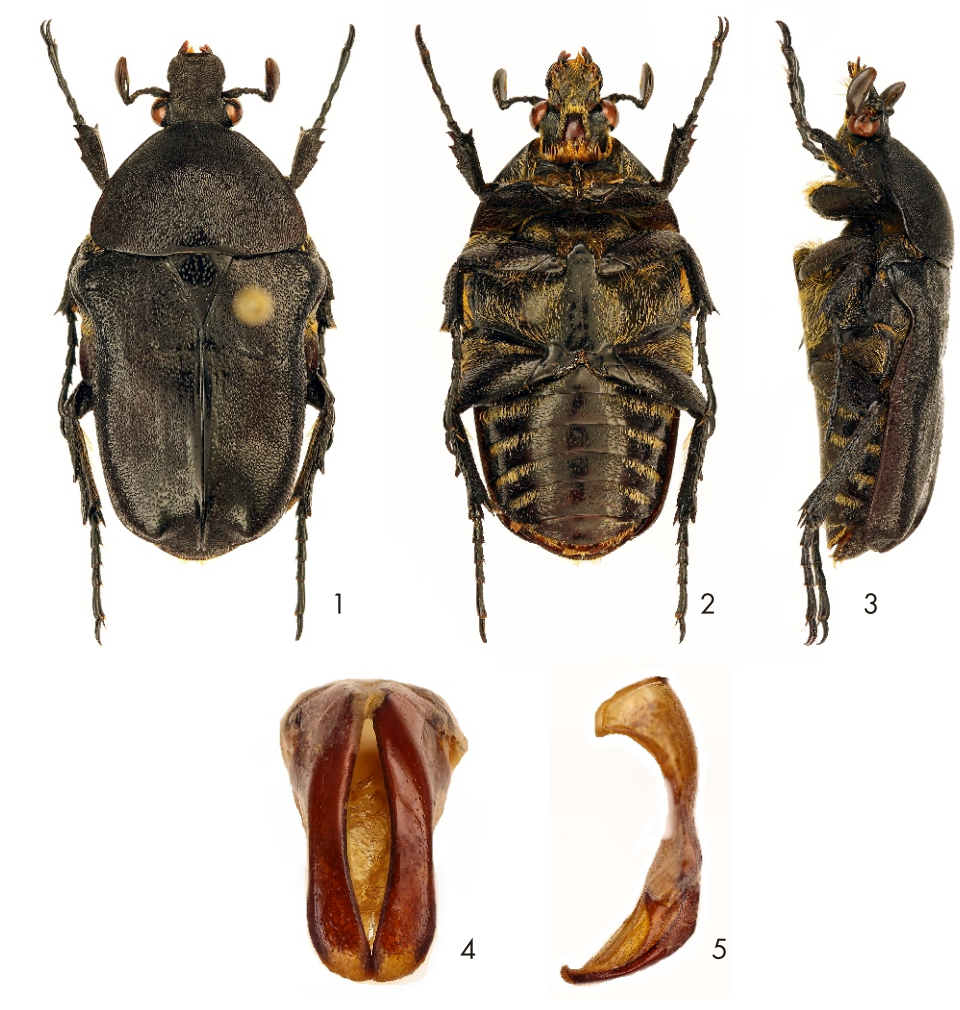
The following codens of institutional and private collections are used in text:

MNHN Muséum national d'Histoire naturelle, Paris, France;
SJCP Stanislav Jákl, private collection, Praha, Czech Republic;
ZMHB Museum fur Naturkunde der Humboldt-Universitat, Berlin, Germany.

RESULTS

***Cosmiomorpha* (*Microcosmiomorpha*) *tonkinensis* Moser, 1903 bonna species**
(Figs. 1-5)

Cosmiomorpha tonkinensis Moser, 1903: 145 (original description).
Schenkling, 1921: 61 (catalogue).
Paulian, 1960: 56 syn. of *Cosmiomorpha cribellata*.
Mikšič, 1974: 771 syn. of *C.* (*Microcosmiomorpha*) *setulosa cribellata*.
Mikšič, 1977: 360 syn. of *C.* (*Microcosmiomorpha*) *setulosa cribellata*.



Figs. 1-5. *Cosmiomorpha* (*Microcosmiomorpha*) *tonkinensis* Moser, 1903: 1- habitus dorsal aspect; 2- habitus ventral aspect; 3- habitus lateral aspect; 4- aedeagus; 5- aedeagus lateral aspect.

Type locality. Tonkin, Montes Mauson (recently Tam Dao) (H. Fruhstorfer).

Type material (all ZMHB)**.** Lectotype m here designated, labelled: Tonkin / Montes Mauson / April-Mai 2-3000 / H.Fruhstorfer // Coll. Jul. Moser // Cosmiomorpha / setulosa West. / ssp.cribellata Fairm. / Det. Mikšič 1974 // Syntypus / Cosmiomorpha / tonkinensis Moser, 1903 / labelled by MNHUB 2014 // Lectotype / Cosmiomorpha (Microcosmiomorpha) / tonkinensis / St.Jákl des. 2015. Paralectotypes: No.1 and 2, m, same label data as the lectotype, but labelled: same as Lectotype, but Paralectotype No.1 and No. 2/ St. Jákl des., 2015; Paralectotype No. 3 f labelled: Tonkin/Than-Moi/Juni-Juli/H.Fruhstorfer; Paralectotype No.4 m and No.5 f [belonging to *Cosmiomorpha* (*Microcosmiomorpha*) *setulosa cribellata*] labelled: same as Lectotype.

Additional material examined (all SJCP)**.** 4 ♂♂, 1 ♀ labelled: N. VIETNAM, 900 m / TamDao, 27.5.- / 2.6.86 A. Olexa; 1 ♂, 1 ♀ labelled: N. Vietnam, vii.1991 / SAPA / J. Strnad lgt; 1 ♀ labelled: Tam Dao, Vietnam, 4.-11.vi. 1990 / J. Secký leg; 8 ♂♂, 2 ♀♀ labelled: N. VIETNAM / Tam Dao N.P. / Tam Dao env., 19.-28.VI. / 900-1200 m, 2011 / E. Jendek leg.

Remark. *Cosmiomorpha tonkinensis* was described from unknown number of syntypes. The six syntypes preserved in Moser's collection in NMHB actually belong to two different species. To fix the unambiguous identity of the species, the lectotype is designated here.

Diagnosis. *Cosmiomorpha* (*Microcosmiomorpha*) *tonkinensis* can be distinguished from all its congeners flying in the region by its relatively large size 18.2-20.5 mm, raised apical margin of the clypeus, separated horse-shoe shaped punctures in elytral disc, absence of abdominal impression in both sexes, short and wide mesometasternal process, missing or only vaguely developed elytra ribs, not elongate scutellar shield and unique structure of male parameres.

Distribution. Northern Vietnam (Tam Dao and Mt. Sapa).

***Cosmiomorpha* (*Microcosmiomorpha*) *setulosa cribellata* Fairmaire, 1893**
(Figs. 6-10)

Cosmonota cribellata Fairmaire, 1893: 314 (original description).
Paulian, 1960: 56 *Cosmiomorpha cribellata* (checklist).
Mikšič, 1974: 771 *Cosmiomorpha* (*Microcosmiomorpha*) *setulosa cribellata* (review).
Mikšič, 1977: 360 *Cosmiomorpha* (*Microcosmiomorpha*) *setulosa cribellata* (monography).
Sakai & Nagai, 1988: 236 fig. 676 1-2 *Cosmiomorpha* (*Microcosmiomorpha*) *setulosa cribellata* (iconography).
Jákl, 2014: 462 fig. 25-29 *Cosmiomorpha* (*Microcosmiomorpha*) *setulosa cribellata* (illustration habitus, aedeagus of holotype).

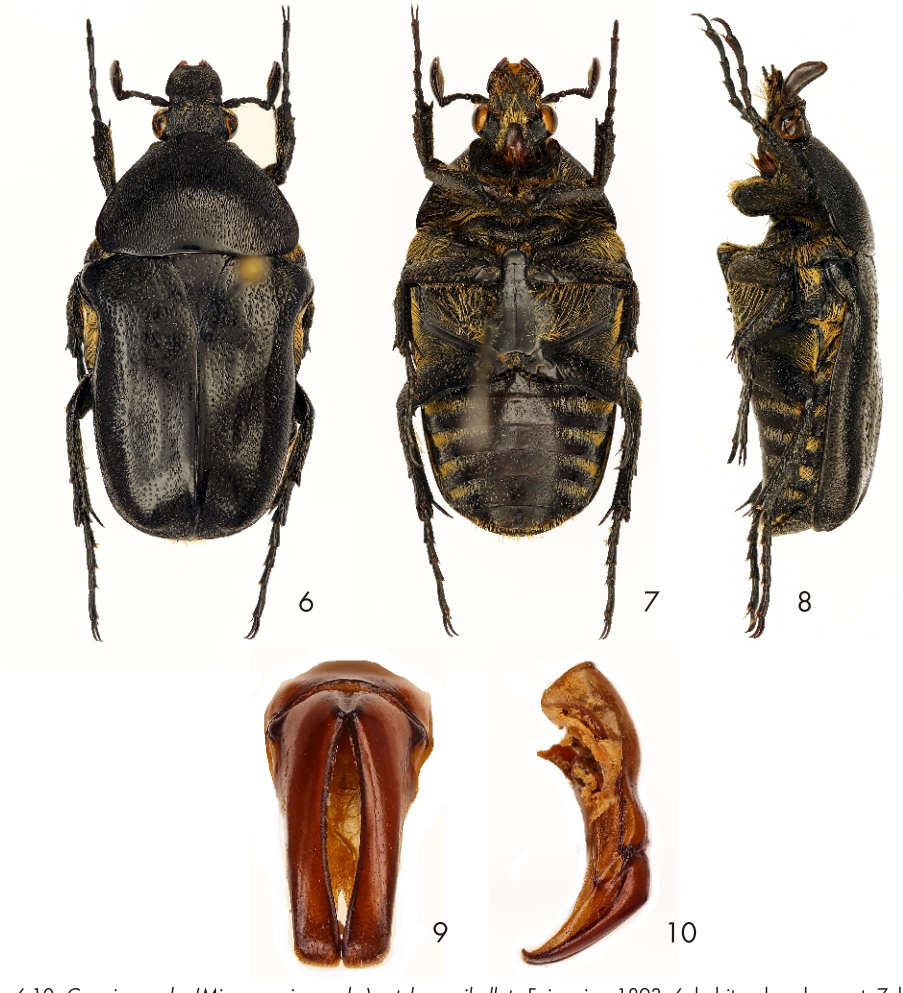
Remark. The author regards the generic name *Cosmonota* as incorrect original spelling by Fairmaire, not as a new homonym for *Cosmonota* Blanchard, 1845.

Type locality. Haut - Tonkin.

Type material (MNHN)**.** Holotypus ♂ labelled: *Cosmonota cribellata* / Fairm 1893 / Tonkin // MUSEUM PARIS / Collection Léon Fairmaire / 1906.

Additional material examined (all SJCP)**.** 5 ♂♂, 3 ♀♀ labelled: Tam Dao, 20.-27.6. / N. VIETNAM / A. Olexa 1900; 1 ♂, 1 ♀: Vietnam / Tam Dao, 6.-11.6. 1985 / Vinh Phu prov. / Strnad Jan lgt; 1m, 1f labelled: VIETNAM / 8.6.89 / TAM DAO / M.Homoláč lgt; 3 ♂♂, 1 ♀ labelled: N.Vietnam 900 m / TamDao 27.5.- / 2.6. 86 A. Olexa; 1♂ labelled: VIETNAM N 1990 / Sa-Pa 11.-19.VI. 1500 m / Hoang Lien Son prov. / Strnad Jan lgt; 1♂, 1♀ labelled: Vietnam, Tam Dao / 27.5.-2.6. 1986 / Vinh Phu prov. / Jan Horák lgt; 3 ♂♂, 1 ♀ labelled: N VIETNAM (Tonkin) / pr. Vinh Phu 1990 / TAM DAO 17.-21. V. / L. Dembický leg; 5 ♂♂, 1 ♀: Laos-Xieng Khouang pr. / route no. 660 km N of / Phongsavan, 1.-10.IV. / 2010, local collectors lgt; 1 ♂ labelled: Laos CE1.-18.5. 2001 / BOLIKHAM XAI PROV. 800 m / 18 21 N 105 08 E / BAN NAPE, 8 km E, Kubáň lgt; 1 ♂ labelled: YUNNAN, 5. + 15.VII.1996 / 28 00 06 N 98 55 E / Hengduan Mts., YANMEN / Vít Kubáň leg,

2200 m; 3 ♂♂, 1 ♀ labelled: China S, Guizhou prov. / MAOLAN, 700-800 m / 25 19 N 107 52 E / Jatua leg, 20. VI. 2012; 1 ♂ labelled: YUNNAN, 1800-2500 m / 25 16 N 100 27 E / WEIBAOSHAN Mts. / E slope, 1.7. 92 / Vít Kubáň leg; 1 ♀ labelled: CHINA- Guangxi reg. / 100 km N of Liuzhou / Yang Shud, 10.7.1990 / Dunda lgt.



Figs. 6-10. *Cosmiomorpha* (*Microcosmiomorpha*) *setulosa cribellata* Fairmaire, 1893: 6- habitus dorsal aspect; 7- habitus ventral aspect; 8- habitus lateral aspect; 9- aedeagus; 10- aedeagus lateral aspect.

Differential diagnosis. See the following table.

species	size	male abdominal impression	disc of elytra	male parameres
C. tonkinensis	males 18.2-20,5 mm, females 18.8-20.2 mm	absent	with confluent or almost confluent, horse- shoe shaped punctures	more rounded at sides (Figs. 4-5)
C. setulosa cribellata	males 12.8-16.8, females 13.5-17.8	present	separately distributed punctures	almost paralelly developed (Figs. 9-10)

UPDATED LIST WITH DISTRIBUTION OF *COSMIOMORPHA* (*MICROCOSMIOMORPHA*)

C. (*Microcosmiomorpha*) *horni* Bourgoin, 1931	Taiwan
C. (*Microcosmiomorpha*) *pacholatkoi* Jákl, 2014	N. Vietnam
C. (*Microcosmiomorpha*) *schneideri* Jákl, 2014	China: Yunnan, Tibet
C. (*Microcosmiomorpha*) *setulosa* Westwood, 1854	N. China
C. (*Microcosmiomorpha*) *setulosa cribellata* Fairmaire, 1893	N. Vietnam, N. Laos, S. China
C. (*Microcosmiomorpha*) *setulosa intermedia* Mikšič, 1974	China: Fukien
C. (*Microcosmiomorpha*) *similis* Fairmaire, 1899	Taiwan
C. (*Microcosmiomorpha*) *similis nigra* Niijima et Kinoshita, 1927	Japan: Ishigaki Is.
C. (*Microcosmiomorpha*) *similis miyakoana* Nomura, 1964	Japan: Miyako Is.
C. (*Microcosmiomorpha*) *similis yonakuniana* Nomura, 1964	Japan: Yonakuni Is.
C. (*Microcosmiomorpha*) *taiwanomontanus* Masumoto et Sakai, 1988	Taiwan
C. (*Microcosmiomorpha*) *tonkinensis* Moser, 1903 **bonna species**	N. Vietnam
C. (*Microcosmiomorpha*) *tricostata* Jákl, 2014	N. Laos

ACKNOWLEDGEMENT. I deeply thank to Joachim Villers (ZMHB) and Antoine Mantilleri (MNHN) for providing me with the type material. I am grateful to Jiří Hájek (NMPC), Aleš Bezděk (České Budějovice, Czech Republic) and David Král (Praha, Czech Republic) for their professional advice. My thanks also goe to Arnošt Kudrna (České Budějovice) for his digital photography.

REFERENCES

JÁKL S. 2014: Contribution to knowledge of *Cosmiomorpha* (*Microcosmiomorpha*) Mikšič, 1977 (Coleoptera: Scarabaidae: Cetoniinae: Goliathini) with descriptions of three new species. *Studies and Reports, Taxonomical Series* 10 (2): 453-464.

MASUMOTO K. & SAKAI K. 1988: Study of Asian Cetoniinae (IV), Notes on the genus *Cosmiomorpha* from Japan (Ryukyu) and Taiwan. *The Entomological Review of Japan* 43: 115-121.

MIKŠIČ R. 1974: Die orientalische und palaarctischen Gattungen der Heterorrhinini. *Revue Suisse de Zoologie* 81 (4): 737-783.

MIKŠIČ R. 1977: *Monographie der Cetoniinae der palaarctischen und orientalischen Region. Coleoptera: Lamellicornia Band 2. Systematischer Teil: Gymnetini (Lomapterina, Clinteriina), Phaedimini, Gnathocerini, Heterorrhinini.* Sarajevo: Forstinstitut in Sarajevo, 400 pp., 15 pls.

PAULIAN R. 1960: Coléopteres Scarabéides de L´Indochina (Rutélines et Cétonides) (suite). *Annales de la Société de France* 129: 137-224.

SAKAI K. & NAGAI S. 1998: The Cetoniinae beetles of the World. Pp. 1-6 + 7-150 unpag. (pls. 1-144) + 151- 421 + 3 unpag. In: Fujita H. (ed.): *Mushi Sha's icongraphic series of insects 3*. Mushi- Sha, Tokyo, 2 unpag. + 342 + 5 unpag. (in Japanese and English).

SCHENKLING S. 1921: Scarabaeidae: Cetoninae. Pp. 1-432. In: SCHENKLING S. & JUNK W. (eds.): *Coleopterorum Catalogus. Pars 72*. Berlin: W. Junk, 432 pp.

SMETANA A. 2006: Subfamily Cetoniinae Leach, 1815. Pp. 283-312. In: LÖBL I. & SMETANA A. (eds.): *Catalogue of Palaearctic Coleoptera, Volume 3. Scarabaeoidea - Scirtoidea - Dasciloidea - Buprestoidea*. Stenstrup: Apollo Books, 690 pp.