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TAXONOMY OF THE GENUS *MORPHOSTENOPHANES* PIC FROM CHINA, WITH TWO NEW SPECIES (COLEOPTERA, TENEBRIONIDAE)

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Chinese species belonging to the tenebrionid genus *Morphostenophanes* PIC are reviewed. The Chinese fauna is composed of six previously described species-group taxa (*M. aenescens* PIC, 1925, *M. papillatus* KASZAB, 1941, *M. atavus* (KASZAB, 1960), *M. tanikadoi* MASUMOTO, 1998, *M. jendeki jendeki* MASUMOTO, 1998 and *M. jendeki similis* MASUMOTO, 1998) and two newly described species (*M. cuproviridis* sp. n. and *M. tuberculatus* sp. n. from Guizhou and Yunnan). The type specimens are deposited in the Museum of Hebei University.

Key words: Coleoptera, Tenebrionidae, *Morphostenophanes*, taxonomy, new species, China

INTRODUCTION

The genus *Morphostenophanes* is a small arboreal group of darkling beetles endemic to the Oriental Region. KASZAB (1941, 1960) and GEBIEN (1942) placed *Morphostenophanes* in the tribe Misolampini (= Coelometopini = Cnodalonini, DOYEN 1989, BOUCHARD *et al.* 2005), MASUMOTO and BEČVÁŘ (2008) and LÖBL *et al.* (2008) also placed *Morphostenophanes* in the tribe Cnodalonini. So far this genus has nine species-group taxa distributed in China, North Thailand, North Vietnam and Myanmar (PIC 1925, KASZAB 1941, 1960, 1980, MASUMOTO 1990, 1998, MASUMOTO & BEČVÁŘ 2008).

PIC (1925) erected the genus *Morphostenophanes* for *M. aenescens* from Yunnan, at the same time, he described two varieties of *M. aenescens*, var. *diversus* and var. *subparallelus.* KASZAB (1941) described *M. papillatus* from "Szetchuan" (Sichuan). Later, MASUMOTO (1998) described two species and a subspecies, *M. tanikadoi* from Sichuan, *M. jendeki* and *M. jendeki similis*, both from Yunnan.

KASZAB (1960) erected *Promorphostenophanes* for *P. atavus* from Yunnan. KASZAB (1980) also described two subspecies of *P. atavus* subsp. *vietnamicus* from North Vietnam, and subsp. *birmanicus* from "Burma: Shan States" (Myanmar: Shan States). MASUMOTO (1990) described *P. koyamai* from North Thailand.

MASUMOTO and BEČVÁŘ (2008) transferred the genus *Promorphostenophanes* KASZAB, 1960 to the genus *Morphostenophanes* PIC, 1925 as a junior synonym of the latter, and proposed new combination for *M. atavus* (KASZAB, 1960),

new combinations and statuses for two subspecies mentioned above raising to the specific rank, *M. vietnamicus* (KASZAB, 1980) and *M. birmanicus* (KASZAB, 1980). They also described a new species, *M. elegantulus* from North Thailand and treated *P. koyamai* MASUMOTO, 1990 as a junior synonym of *M. birmanicus* (KASZAB, 1980).

This genus in China comprises six species-group taxa (MASUMOTO & BEČVÁŘ 2008, LÖBL *et al.* 2008) up to now. Here, we describe two additional species from China under the names *M. cuproviridis* sp. n. and *M. tuberculatus* sp. n. A list and a key to the known species from China are provided in the present paper. The type specimens used herein are preserved in the Museum of Hebei University (MHBU).

MATERIAL AND METHODS

All specimens used in this study come from the Museum of Hebei University (MHBU) except where mentioned otherwise. They were examined and illustrated under a Nikon SMZ800 stereomicroscope, and measured under the KEYENCE VHX-100 Free Angle Observation System. Photographs of the adults were taken with a FinePix F10 digital camera.

GENUS *MORPHOSTENOPHANES* PIC, 1925

Morphostenophanes PIC, 1925: 7, KASZAB 1941: 10, MASUMOTO & BEČVÁŘ 2008: 206, LÖBL *et al.* 2008: 344. Type species: *Morphostenophanes aenescens* PIC, 1925 (= *M. aenescens* var. *diversus* PIC, 1925 = *M. aenescens* var. *subparallelus* PIC, 1925)

Promorphostenophanes KASZAB, 1960: 277, MASUMOTO & BEČVÁŘ 2008: 206, LÖBL *et al.* 2008: 347. Type species: *Promorphostenophanes atavus* KASZAB, 1960

Diagnosis. The species of *Morphostenophanes* differ from each other in body outline, body size and elytral sculpture. All species are flightless, and the male usually possesses more slender body than female. *Morphostenophanes* species from China have various characteristics probably because of the particular geographical features with obvious gaps between high mountains and deep gorges in their distribution area (Yunnan, Sichuan and Guizhou). This genus is characterized as follows: body elongate, nearly glabrous on dorsal and ventral surfaces, constricted between pronotum and elytra, antennae slender with segments slightly thickened to each apex, femora not clavate, tarsi tufted ventrally, widened to each apex, anal sternite sulcate along outer margin, the sulcus interrupted in middle, genitalia in female and the 8th abdominal sternite sclerotized, hind wings absent.

Distribution. China, North Thailand, North Vietnam, Myanmar.

KEY TO THE GENUS *MORPHOSTENOPHANES* SPECIES FROM CHINA

1 Body length more than 17 mm 2

– Body length 12–15.5 mm 5

2 Elytra striate, without rows of large umbilicate punctures, body length 23–27 mm, Yunnan *M. atavus* (KASZAB, 1960)

– Elytra not striate, with irregular rows of large umbilicate punctures 3

3 Each umbilicate puncture of elytra strongly raised at middle, body length 19 mm, Sichuan, Guizhou *M. papillatus* KASZAB, 1941

– Each umbilicate puncture of elytra not strongly raised at middle 4

4 Body purplish bronze, noticeably and greenly shining; frons between eyes slightly flattened, with a pair of deep concavities in anterior parts; pronotum widest a little before the middle, body length 19–20.5 mm, Guizhou **M. cuproviridis** sp. n.

– Body nearly black, with slight metallic sheen; frons between eyes gently convex, without a pair of deep concavities in apical parts; pronotum widest at middle, body length 17–22 mm, Yunnan *M. aenescens* PIC, 1925

5 Elytra with irregular rows of tubercles, body length 15.5 mm, Yunnan **M. tuberculatus** sp. n.

– Elytra with rows of irregular punctures, which are often connected with one another and forming irregular foveae 6

6 Body narrower, ratio of body length/body width = 3.0, dorsal surface with strong metallic lustre; antennae slightly bolder, reaching basal 1/8 of elytra; pronotum quadrate, less strongly convex above, 12–13 mm, Sichuan *M. tanikadoi* MASUMOTO, 1998

– Body more robust, ratio of body length/body width = 2.6; antennae rather slenderer, reaching basal 1/5 of elytra; pronotum barrel-shaped, more strongly convex above 7

7 Clypeus weakly depressed in basal portion; postgenae distinctly produced; eyes strongly convex laterad; pronotum slightly bisinuate at base, sides noticeably produced laterad and sinuous in basal parts, disc weakly im-

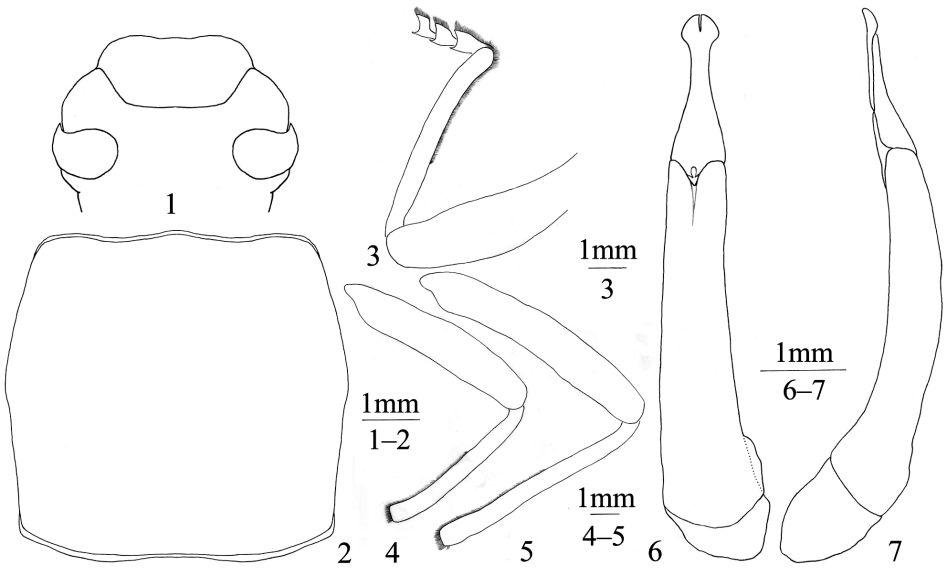
pressed on each side slightly before and behind the middle; elytral apices slightly produced, body length 12.5–15.5 mm, Yunnan
M. jendeki jendeki MASUMOTO, 1998

– Clypeus noticeably depressed in basal portion; postgenae less distinctly produced; eyes less strongly convex laterad; pronotum nearly straight in middle of base, sides evenly produced laterad, disc with a pair of round impressions slightly before the middle; elytral apices moderately produced, body length 12.5–15 mm, Yunnan *M. jendeki similis* MASUMOTO, 1998

Morphostenophanes aenescens PIC, 1925
(Figs 1–7, 41)

Morphostenophanes aenescens PIC, 1925: 7, KASZAB 1941: 10, ANDO & REN 2006: 90, MASUMOTO & BEČVÁŘ 2008: 206, LÖBL *et al.* 2008: 344.
Morphostenophanes aenescens var. *diversus* PIC, 1925: 7, KASZAB 1941: 10, LÖBL *et al.* 2008: 344.
Morphostenophanes aenescens var. *subparallelus* PIC, 1925: 7, KASZAB 1941: 10, LÖBL *et al.* 2008: 344.

Material examined. Male (Fig. 41), CHINA: Yunnan Province, Binchuan County, Hetaoping, 16 April 1957, Jie Lu leg.; female, same locality as the former, 4 April 1957, Jie Lu leg.; 1 male and 1



Figs 1–7. *Morphostenophanes aenescens* PIC, male, collected from Hetaoping: 1 = head, dorsal view, 2 = pronotum, dorsal view, 3 = left fore leg, dorsal view, 4 = left middle leg, ventral view, 5 = left hind leg, ventral view, 6 & 7 = male genitalia, dorsal (6) and lateral (7) view. Scales: 1 mm

female, CHINA: Yunnan Province, Longling County, Longxin, Heishan, 2300 m, 23 July 2008, Ji-Shan Xu and Zhen-Hua Gao leg.

Distribution. China: Yunnan.

Morphostenophanes papillatus KASZAB, 1941
(Figs 8–15, 42)

Morphostenophanes papillatus KASZAB, 1941: 11, ANDO & REN 2006: 90, MASUMOTO & BEČVÁŘ 2008: 206, LÖBL *et al.* 2008: 344.

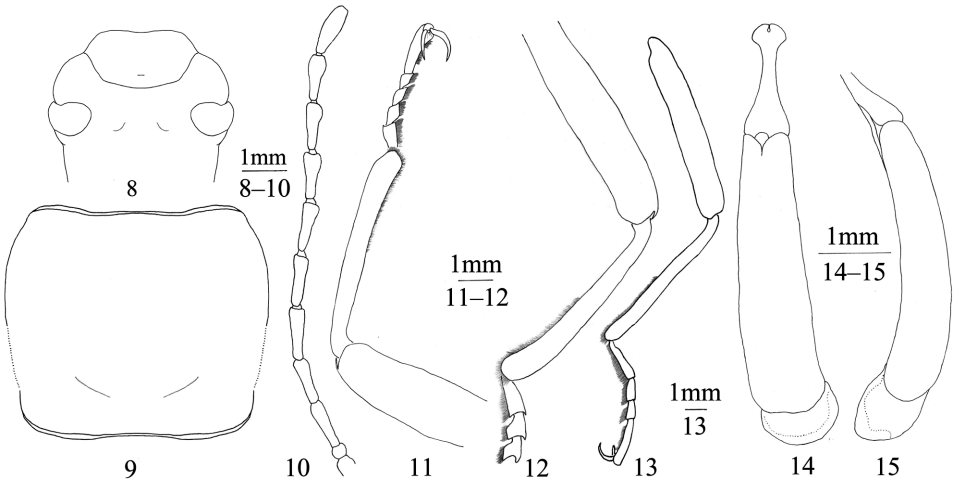
Material examined. Male (Fig. 42), CHINA: Guizhou Province, Jiangkou County, Mt. Fanjingshan, 29 July 2001, Guo-Dong Ren leg.

Distribution. China: Sichuan, Guizhou.

Morphostenophanes atavus (KASZAB, 1960)
(Figs 16–22, 43)

Promorphostenophanes atavus KASZAB, 1960: 278, ANDO & REN 2006: 90, MASUMOTO & BEČVÁŘ 2008: 209, LÖBL *et al.* 2008: 347.
Morphostenophanes atavus (KASZAB, 1960), MASUMOTO & BEČVÁŘ 2008: 209.

Material examined. Female (Fig. 43), CHINA: Yunnan Province, Yingjiang County, 1750 m, 20 June 1995, Zheng-hui Xu leg.; female, CHINA: Yunnan Province, Tengchong County, Houqiao,



Figs 8–15. *Morphostenophanes papillatus* KASZAB, male: 8 = head, dorsal view, 9 = pronotum, dorsal view, 10 = left antenna, dorsal view, 11 = left fore leg, dorsal view, 12 = left middle leg, ventral view, 13 = left hind leg, ventral view, 14 & 15 = male genitalia, dorsal (14) and lateral (15) view (apex broken). Scales: 1 mm

Doujiazhai, N 25°21'28", E 98°13'38", 1673 m, 30 May 2006, Hong-bin Liang and P. Hu leg., California Academy & IOZ. Chinese Acad. Sci.

Distribution. China: Yunnan.

Morphostenophanes tanikadoi MASUMOTO, 1998

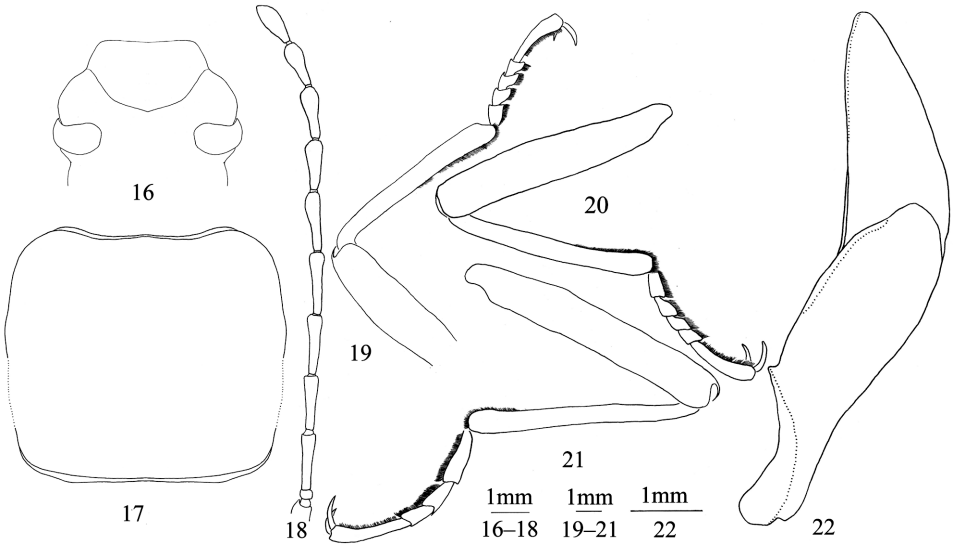
Morphostenophanes tanikadoi MASUMOTO, 1998: 305, LÖBL *et al.* 2008: 344.

Material examined. None.
Distribution. China: Sichuan.

Morphostenophanes jendeki jendeki MASUMOTO, 1998

Morphostenophanes jendeki jendeki MASUMOTO, 1998: 307, LÖBL *et al.* 2008: 344.

Material examined. None.
Distribution. China: Yunnan.



Figs 16–22. *Morphostenophanes atavus* (KASZAB), female, collected from Yingjiang County: 16 = head, dorsal view, 17 = pronotum, dorsal view, 18 = right antenna, dorsal view, 19 = left fore leg, dorsal view, 20 = right middle leg, ventral view, 21 = left hind leg, ventral view, 22 = female genitalia, lateral view. Scales: 1 mm

Morphostenophanes jendeki similis MASUMOTO, 1998

Morphostenophanes jendeki similis MASUMOTO, 1998: 308, LÖBL *et al.* 2008: 344.

Material examined. None.
Distribution. China: Yunnan.

Morphostenophanes cuproviridis sp. n.
(Figs 23–30, 39)

Description. Male (Fig. 39). Purplish bronze, body strongly, greenly shining, except for antennae, mouthparts, tarsi and claws dark brown; tarsi dorsally and basal segments of antennae slightly, sericeously shining; dorsal and ventral surfaces of body nearly glabrous, weakly covered with isodiametric microsculpture. Rather elongate, strongly convex dorsad, obviously constricted between pronotum and elytra. Hind wings absent. Body length 19.0–20.5 mm, width 7.1–8.1 mm.

Head (Fig. 23) transversely subquadrate, densely scattered with small punctures, with outer margin noticeably notched between genae and clypeus; labrum transversely oblong with rounded corners, dorsal surface densely bearing long golden hairs, weakly emarginate and with dense short hairs in middle of apex; clypeus transversely subhexagonal, with a small transverse impression behind the middle, slightly inclined forwards, gently emarginate in middle of apex; fronto-clypeal border nearly U-shaped, strongly sulcate, the sulcus becoming weaker laterad and reaching outer edges; genae slightly raised, noticeably and roundly produced antero-laterad, less prominent laterad than eyes, slightly depressed in interior parts of preocular areas, postgenae slightly produced, less prominent laterad than eyes; frons slightly flattened, with a pair of deep concavities in anterior parts; eyes transversely elliptical, slightly convex laterad, interspace between eyes about 2.0–2.2 (2.1 on average, n = 3) times as wide as the transverse diameter of an eye in male. Antennae (Fig. 25) slender, reaching basal 5/18 of elytra; each segment weakly dilated to apex; 2nd segment shortest, terminal one somewhat gavel-shaped; relative length of each segment from base to apex: 0.76: 0.26: 1.09: 0.93: 0.94: 0.97: 1.10: 0.98: 0.97: 0.87: 0.96. Terminal segment of maxillary palpus triangular, with long golden hairs on surface.

Pronotum (Fig. 24) quadrate, 1.1 (n = 3) times as wide as long, widest at apical 3/7; apex weakly bisinuate, nearly straight in middle, clearly bordered, with rim fine but distinct, slightly thinner than that of base; base slightly narrower than apex, distinctly and boldly rimmed, the rim slightly curved and thinned in middle; sides steeply sloping towards lateral margins, lateral margins with rim fine and visible in dorsal view, slightly tumid before the middle, weakly sinuous in basal portions; anterior angles slightly produced antero-laterad, whose corners are rounded, furnished with obliquely lineate impressions, posterior angles subrectangular; disc slightly convex, less densely and irregularly furnished with small punctures than those in head, with a pair of small round impressions in middle; median line weakly impressed. Prosternum slightly wrinkled, prosternal process gently wrinkled, strongly raised between coxae, then bending downwards, slightly dilated and weakly convex at the apex; propleuron slightly and annularly wrinkled. Scutellum obtusely triangular, with rounded lateral edges, slightly convex in middle, sparsely scattered with small punctures.

Elytra oblong-ovate, 1.7–1.8 (1.75 on average, n = 3) times as long as wide, 2.7–2.9 (2.8 on average, n = 3) times the length and 2.5 (n = 3) times the width of pronotum, widest at basal 4/7; dorsum strongly convex, sparsely scattered with small punctures, weakly ridged along suture, not convex near humeri, with irregular rows of large umbilicate punctures, each umbilicate puncture gently

raised at middle; base almost straight, weakly depressed in lateral parts, nearly as wide as pronotum at base; sides precipitously descending towards lateral margins; apices neither produced nor dehiscent.

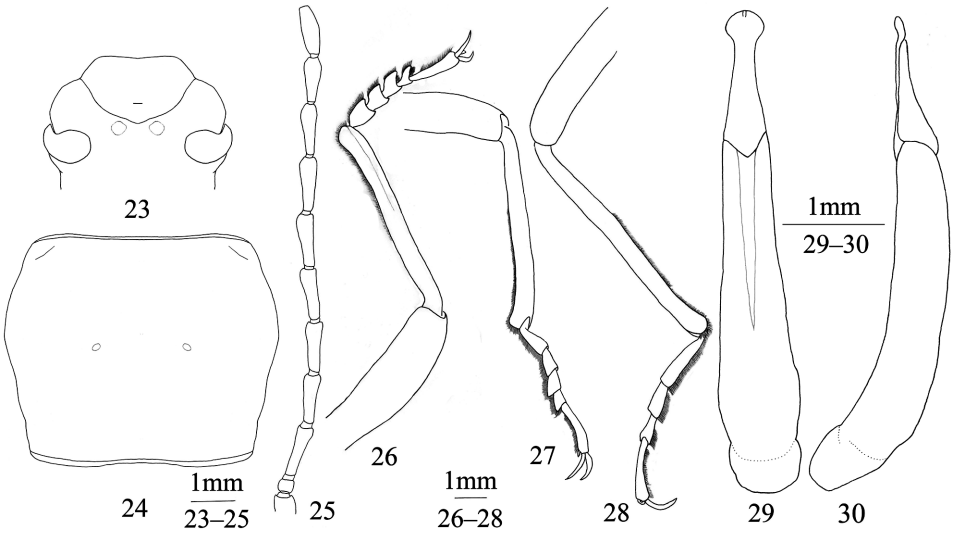
Mesosternum transversely wrinkled; metasternum noticeably convex, transversely wrinkled in apical parts. Abdomen densely scattered with small punctures; four basal sternites slightly wrinkled basally and laterally; anal sternite rounded at apex, finely sulcate in a line-shape along outer margin, the sulcus widely interrupted in middle.

Legs (Figs 26–28) slender, tibial calcaria hidden in golden setae, empodium inserted between two claws, with long hairs on it, terminal segment of tarsi ventrally with a lamella at apex. Profemora slightly thickened in middle, with anterior margins emarginate at apex, meso- and metafemora slenderer than profemora, with posterior margins emarginate at apex; inner margins of tibiae grooved and pubescent nearly in apical 3/5 of protibiae or in apical 7/11 of meso- and metatibiae, pro-, meso- and metatibiae gently curved at apex; protarsi strongly dilated to each apex in basal 3 segments, 4th less strongly so than the 3 basal segments, mesotarsi moderately and metatarsi feebly dilated to each apex; ratios of the lengths of pro-, meso- and metatarsal segments from base to apex: 0.66: 0.50: 0.43: 0.40: 1.33; 0.85: 0.59: 0.50: 0.42: 1.46; 1.77: 0.71: 0.85: 1.52.

Male genitalia (Figs 29–30) elongated subfusiform, slightly curved in lateral view, 4.42 mm in length, 0.73 mm in width; parameres fused with each other, 1.47 mm in length, 0.45 mm in width, strongly tapering from base to apical 1/4, then abruptly widened aPICad, dilated at apex, and reflexed and feebly angulate at sides.

Type material. Holotype male, CHINA: Guizhou Province, Leishan County, Mt. Leigongshan, 14 September 2005, Ji-Liang Wang leg. Paratypes: 2 males, same locality and date as the holotype, Ji-Liang Wang and Chao Gao leg.

Etymology. The specific name is derived from its coloration and green sheen.



Figs 23–30. *Morphostenophanes cuproviridis* sp. n., male: 23 = head, dorsal view, 24 = pronotum, dorsal view, 25 = right antenna, dorsal view, 26 = right fore leg, dorsal view, 27 = right middle leg, dorsal view, 28 = left hind leg, dorsal view, 29 & 30 = male genitalia, dorsal (29) and lateral (30) view. Scales: 1 mm

Notes. There are a little difference between the paratype and the holotype, the holotype has a slightly more robust body, head and pronotum a little wider, antennae, legs and apical border of pronotum slightly bolder.

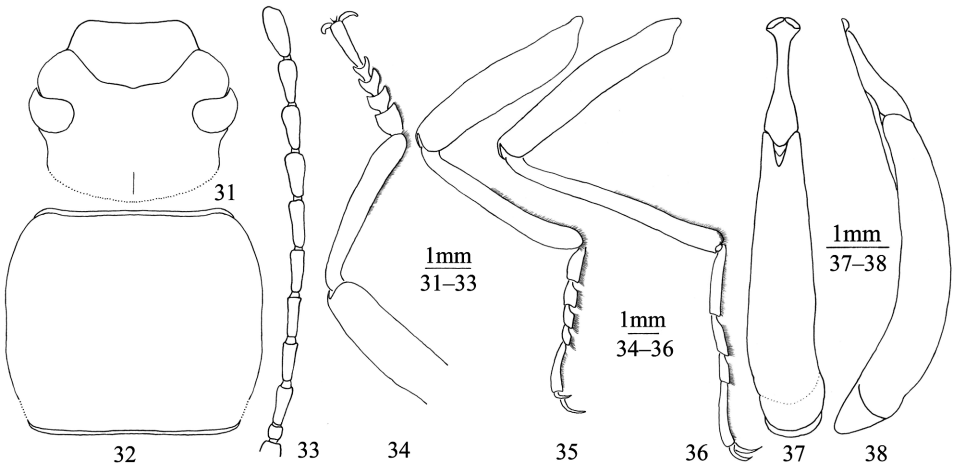
Diagnosis. This new species can be distinguished from *M. aenescens* PIC, 1925 by the body with obvious green sheen, head less densely scattered with smaller punctures, frons between eyes slightly flattened, with a pair of deep concavities in anterior parts, pronotum widest a little before the middle, elytra oblong-ovate, a little smaller in the ratio of elytral length to body length.

Distribution. China: Guizhou.

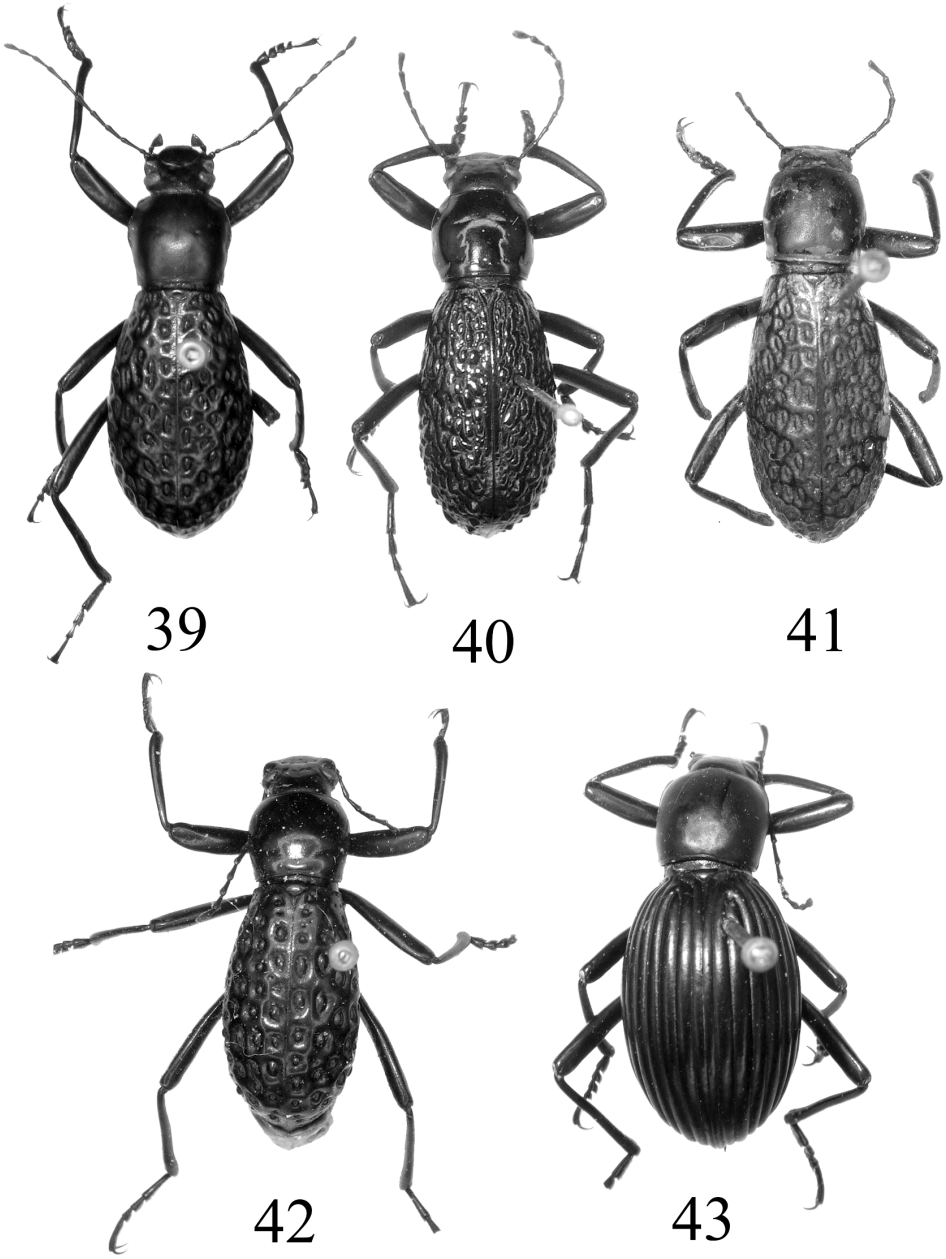
Morphostenophanes tuberculatus sp. n.
(Figs 31–38, 40)

Description. Male (Fig. 40). Brassy, head, pronotum, elytra, scutellum and ventral surface strongly with metallic lustre, the tubercles of elytra in part also feebly and cupreously shining; antennae, mouthparts, apex of femora, dorsal surface of tarsi nearly black, slightly shining; basal portions of femora and claws more or less reddish brown; dorsal and ventral surfaces of body nearly glabrous, weakly covered with isodiametric microsculpture. Body elongate, length 15.5 mm, width 6.0 mm, strongly convex dorsad, noticeably constricted between pronotum and elytra. Hind wings absent.

Head (Fig. 31) transversely subquadrate, densely scattered with small punctures, with outer margin obviously notched between genae and clypeus; labrum transversely elliptical, sparsely with long golden hairs on dorsal surface, densely with short golden hairs in middle of apex; clypeus trans-



Figs 31–38. *Morphostenophanes tuberculatus* sp. n., male: 31 = head, dorsal view, 32 = pronotum, dorsal view, 33 = right antenna, dorsal view, 34 = left fore leg, dorsal view, 35 = right middle leg, ventral view, 36 = right hind leg, ventral view, 37 & 38 = male genitalia, dorsal (37) and lateral (38) view. Scales: 1 mm



Figs 39–43. *Morphostenophanes* spp.: 39 = *M. cuproviridis* sp. n., male, 40 = *M. tuberculatus* sp. n, male, 41 = *M. aenescens* PIC, male, collected from Hetaoping, 42 = *M. papillatus* KASZAB, male, 43 = *M. atavus* (KASZAB), female, collected from Yingjiang County

versely subhexagonal, slightly inclined downwards, emarginate in middle of apex, gently depressed in antero-lateral parts; fronto-clypeal border widely U-shaped and sulcate, the sulcus becoming weaker laterad and reaching outer edges; genae gently raised, roundly produced laterad, less prominent laterad than eyes, depressed in interior parts of preocular areas, postgenae slightly produced, less prominent laterad than eyes; frons slightly convex, steeply inclined forwards; eyes transversely elliptical, gently convex laterad, interspace between eyes about 2.6 (n = 1) times as wide as the transverse diameter of an eye; vertex irregularly wrinkled, weakly and longitudinally impressed in middle. Antennae (Fig. 33) subfiliform, reaching basal 2/11 of elytra; each segment weakly thickened towards apex; 2nd segment shortest, terminal one somewhat oblong-ovate; apical segments with dense hairs; relative length of each segment from base to apex: 0.60: 0.26: 0.77: 0.76: 0.79: 0.83: 0.87: 0.76: 0.80: 0.77: 0.93. Terminal segment of maxillary palpus triangular, with golden hairs; apex nearly straight.

Pronotum (Fig. 32) quadrate, 1.2 (n = 1) times as wide as long, widest a little before the middle; apex almost straight, weakly curved forwards at sides, distinctly rimmed; base nearly straight, clearly rimmed, the rim a little thinner than that of apex; sides steeply sloping towards lateral margins, lateral margins finely rimmed, weakly concave in middle; anterior angles rounded, posterior angles obtusely angulate with rounded corners; disc strongly convex, less densely scattered with very small punctures than those in head, finely impressed in middle and basal parts. Prosternum noticeably wrinkled, prosternal process strongly raised between coxae, then precipitously deflexed, apex gently dilated, with golden hairs; propleuron rugulose. Scutellum triangular, rather flattened, sparsely punctate.

Elytra elongate, 1.8 (n = 1) times as long as wide, 2.8 (n = 1) times the length and 2.3 (n = 1) times the width of pronotum, widest at basal 6/11, gently convex near humeri, slightly dehiscent at apices; dorsum strongly convex, sparsely and minutely punctate, with irregular rows of tubercles; base nearly straight, subequal in width to pronotum at base; sides steeply declined to lateral margins.

Mesosternum transversely wrinkled, sparsely with golden hairs; metasternum slightly convex, noticeably and transversely wrinkled in apical parts. Abdomen closely scattered with small punctures; four basal sternites gently and longitudinally wrinkled basally; anal sternite rounded at apex, finely sulcate along outer margin, the sulcus widely interrupted in middle.

Legs (Figs 34–36) slender, tibial calcaria smaller and hidden in golden setae, empodium with long hairs on it, terminal segment of tarsi ventrally with a lamella at apex. Profemora gently thickened in middle, emarginate at apex of anterior margins, mesofemora weakly thickened in middle, meso- and metafemora gently slenderer than profemora, with posterior margins emarginate at apex; inner margins of tibiae grooved and pubescent nearly in apical 1/2 of protibiae or in apical 6/11 of meso- and metatibiae, pro- and mesotibiae slightly curved at apex, metatibiae almost straight; protarsi with 3 basal segments strongly widened to each apex, 4th segment slightly widened to apex, mesotarsi moderately and metatarsi weakly widened to each apex; ratios of the lengths of pro-, meso- and metatarsal segments from base to apex: 0.55: 0.41: 0.40: 0.36: 1.33; 1.07: 0.61: 0.46: 0.39: 1.45; 1.46: 0.73: 0.58: 1.51.

Male genitalia (Figs 37–38) elongated subfusiform, slightly curved in lateral view, 5.20 mm in length, 0.79 mm in width; parameres fused with each other, 1.58 mm in length, 0.42 mm in width, strongly narrowed from apical 3/5 to apical 1/4, apex distinctly flabellate, densely scattered with minute tubercles.

Type material. Holotype male, CHINA: Yunnan Province, Lushui County, Pianma, Yakou, 19 May 2005, Xiao-Hong Ou leg.

Etymology. This new species is named after the particular tubercles on elytra.

Diagnosis. This new species and *M. tanikadoi* MASUMOTO, 1998, *M. jendeki jendeki* MASUMOTO, 1998, *M. jendeki similis* MASUMOTO, 1998 are smaller in size than the other members of this genus. The new species can be distinguished from the latter three species by the lateral margins of pronotum weakly concave in middle, elytra with irregular rows of tubercles, and the tubercles in part feebly and cupreously shining.

Distribution. China: Yunnan.

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