

A New Species of Non-Colored Bands Nominee Bees in Subgenus *Maculonomia* (Hymenoptera: Apoidea: Halictidae: Nomiinae: *Nomia*) from China

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ABSTRACT

Nomia (*Maculonomia*) *xiongjiuensis* Niu & Zhu, sp. nov., one of non-colored bands *nomiine* bees in subgenus *Nomia* (*Maculonomia*) from China, is described and illustrated for the first time to science, the type specimens were deposited in the Insect Collection of Institute of Zoology, Chinese Academy of Sciences, Beijing, China (IZCAS). Furthermore, a summary of Chinese species of the subgenus *Maculonomia* is presented.

INTRODUCTION

The *Maculonomia* was erected by Wu ^[1] as a subgenus of *Nomia*. Wu ^[1] designated *Nomia terminata* Smith as type species of the subgenus, and gave the diagnosis of the subgenus (as the follows). Wu included five species (*Nomia terminata* ^[2], *N. fuscipennis* ^[2,5] within the subgenus, gave the key to these species, and redescribed the male of *N. fuscipennis* by Smith ^[5] and *N. viridicinctula* by Cockerell ^[3,4] respectively. Wu ^[6,7] published some species of *Nomia* from China, of which should belong to the *Maculonomia*. Michener ^[8,9] stated that all of the *Nomiinae* with colored tergal bands belong to *Nomia*, but some species that clearly belong to *Nomia*, however, colored bands are absent. Michener ^[8,9] treated *Maculonomia* as synonym of the subgenus *Acunomia* of *Nomia*, and thought the subgenus *Acunomia* is highly variable and may be a paraphyletic group that should be subdivided. Pauly ^[10] reclassified the *Nominae* from the Oriental region, New Guinea and Pacific islands, treated the *Maculonomia* as a genus, and recorded 19 species within the *Maculonomia*. Ascher and Pickering ^[11] dealt *Nomia* into 10 subgenera, treated *Maculonomia* as subgenus and recorded 21 species within the subgenus *Maculonomia*. Here, we treated *Maculonomia* at the subgeneric level in this study in accordance with Ascher and Pickering ^[11].

The genus *Nomia* has been poorly studied in China. Some important publications includes Wu ^[1,6,7], Huang ^[12]. Of course, status of some subgenera and species should be reviewed and confirmed so as to clarify the species within the subgenus *Maculonomia*. Based on the information of the previous publications and examination of the collection in the Insect Collection of Institute of Zoology, Chinese Academy of Sciences, Beijing, China (IZCAS), we confirmed 11 species of *Maculonomia* occurring in China (**Table 1**), including one new species of the subgenus *Maculonomia*.

Table 1. Summary of species of *Nomia* (*Maculonomia*) currently recognized from China with information on the known sexes and distributions. Sex: M#=Male; F#=Female.

Species	Sexes known	Distribution in China
<i>Nomia</i> (<i>Maculonomia</i>) <i>apicalis</i> ^[5]	F#, M#	China (Fujian, Guangxi, Jiangxi, Sichuan, Xizang, Yunnan)
<i>Nomia</i> (<i>Maculonomia</i>) <i>aureipennis</i> ^[14]	F#, M#	China (Xinjiang)
<i>Nomia</i> (<i>Maculonomia</i>) <i>medogensis</i> ^[7]	F#	China (Xizang)
<i>Nomia</i> (<i>Maculonomia</i>) <i>nitidata</i> ^[15]	F#	China (Zhejiang, Fujian, Sichuan, Yunnan, Hong Kong)
<i>Nomia</i> (<i>Maculonomia</i>) <i>penangensis</i> ^[4]	F#, M#	China (Yunnan, Hong Kong)
<i>Nomia</i> (<i>Maculonomia</i>) <i>planiventris</i> ^[13]	F#, M#	China (Taiwan)
<i>Nomia</i> (<i>Maculonomia</i>) <i>proxima</i> ^[13]	F#, M#	China (Hebei, Hubei, Hunan, Anhui, Fujian, Guangdong, Sichuan, Xinjiang, Taiwan)
<i>Nomia</i> (<i>Maculonomia</i>) <i>rufocaudata</i> ^[7]	F#	China (Xizang)
<i>Nomia</i> (<i>Maculonomia</i>) <i>terminata</i> ^[2]	F#, M#	China (Hubei, Hunan, Fujian, Guangdong, Guangxi, Guizhou, Sichuan, Yunnan, Xinjiang)
<i>Nomia</i> (<i>Maculonomia</i>) <i>viridicinctula</i> ^[3]	F#, M#	China (Gansu, Hubei, Hunan, Zhejiang, Jiangxi, Anhui, Guangxi, Guizhou, Fujian, Sichuan, Yunnan, Hainan, Xinjiang)
<i>Nomia</i> (<i>Maculonomia</i>) <i>xiongjiuensis</i> Niu & Zhu, sp. nov.	F#, M#	China (Xizang)

MATERIALS AND METHODS

All specimens examined are deposited in the Insect Collection of the Institute of Zoology, Chinese Academy of Sciences, Beijing, China (IZCAS). The specimens were examined with a Nikon SMZ 1500 stereomicroscope. Attributes were recorded with a Nikon D7000 digital camera. The morphological terminology used in the descriptions mainly follows Michener ^[8]. Absolute measurements, in millimeters (mm), are used for length of body. For all other structures, relative measurements are used. Abbreviations used in the description are as follows: BL (body length): measured from the base of the antennal socket to the apex of the metasoma; HL (head length): measured from the apicomedian margin of the clypeus to the upper margin of the vertex in frontal view; HW (head width): measured at the widest point of the head across the compound eyes in frontal view; EW (eye width): the greatest width of eye in lateral view; GW (genal width): the greatest width of the gena in lateral view; MsW (mesosomal width): measured between the outer rims of the tegulae in dorsal view; MtW (metasomal width): the greatest width of the metasomal tergum in dorsal view. Abbreviations T1, T2, ... , S1, S2, ... and F1, F2, ... respectively denote the first, second et al. segments of tergum, sternum and flagellomere.

Systematics

Nomia (*Maculonomia*) Wu ^[1]

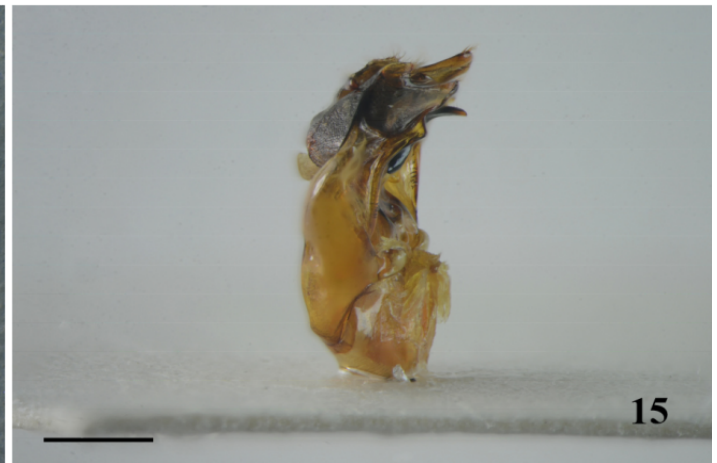
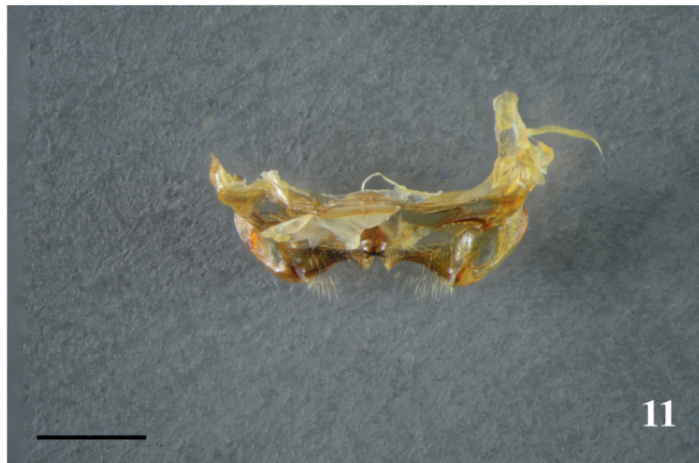
Nomia (*Maculonomia*) Wu ^[1]: 275. Type species: *Nomia terminata* Smith, by original designation.

Diagnosis: female with dark area at apical corner of fore wing; hind femur of male slender, not expanded, smooth and concave on underside, with or without lamelliform projection near base; hind tibia of male with projection at apical underside; S4 of male broaden and large, with fine pubescence; S5 of male with a triangle plate at median apex; S7 of male transverse, with two apical projections involving four pinch of hirsute; male gonostylus double, upper gonostylus of extremely expanded, flattened and lamelliform, with a slender and narrowed lobe, lower gonostylus broaden and bifid apically.

Nomia (*Maculonomia*) *xiongjiuensis* Niu & Zhu, sp. nov.



Figures 1-8. *Nomia (Maculonomia) xiongjiuensis* Niu & Zhu, sp. nov., male. 1: Body in lateral view; 2: Fore wing; 3: Head in frontal view; 4: Mesosoma in dorsal view; 5: Metasoma in dorsal view; 6: Hind femur, showing the projection on inner underside; 7: Middle and hind tibiae, showing absence of basitibial plate; 8: Hind tibia, showing the projections. Scale bars: 1 mm.



Figures 8-15. *Nomia* (*Maculonomia*) *xiongjiuensis* Niu & Zhu, sp. nov., male. 9: S4 in frontal view; 10: S5 in frontal view; 11: S6 in frontal view; 12: S7 in frontal view; 13: S8 in frontal view; 14: Genitalia in dorsal view; 15: Genitalia in lateral view. Scale bars: 1 mm.



Figures 16-24. *Nomia (Maculonomia) xiongjiuensis* Niu & Zhu, sp. nov., female. 16: Body in lateral view; 17: Fore wing; 18: Head in frontal view; 19: Mesosoma in dorsal view; 20: Metanotum in dorsal view; 21: Metasoma in dorsal view; 22: Hind tibia, showing the basitibial plate; 23: Middle tibial spur; 24: Hind tibial spur. Scale bars: 1 mm.

Diagnosis

Within the subgenus *Maculonomia*, only *N. anthophoroides*, *N. apicalis*, *N. nitidata*, and *N. terminata* without colored bands on metasomal terga, so the *Nomia (Maculonomia) xiongjiuensis*, sp. nov. is the fifth species with black metasomal terga (**Figures 1, 5, 16 and 21**). Hind tibia of male with a triangle projection on underside near base (**Figure 8**), similar with that of *N. planiventris* and *N. viridicinctula*, and hind femur of male of the new species with a broaden lamelliform projection (**Figure 6**), especially similar

with that of *N. viridicinctula*; *N. apicalis* with a slender projection on underside near base of male hind femur, and male hind femur of *N. terminata* with a square projection on underside near base, *N. planiventris* and *N. viridicinctula* with orange-yellow bands on T2-T4; these characters can be used to distinguished the new species from *N. planiventris* and *N. viridicinctula*, *N. apicalis* and *N. terminata*. Furthermore, apical margin of T4, T5 and T6 of female of *N. anthophoroides* with orange-red pubescence, but female of the new species only with black pubescence on apical margin of T4, T5 and T6 (**Figures 16 and 21**). Scutum with dense punctures, basitibial plate elongate, tegulae blackish brown, and under surface of flagellomere black, these characters of female of the new species can distinguished from the female of *N. nitidata* (scutal punctures sparse, basitibial plate short, tegulae yellowish brown, and surface of flagellomere yellowish brown) [13-15].

Description

Male, BL=11.5 mm (**Figure 1**); head broader than long, HW: HL=63: 54 (**Figure 3**); gena slightly narrower than eye, GW: EW=15: 17 (**Figure 1**); width of metasoma broader than the width between the tegulae, MtW: MsW=85: 78 (**Figures 4 and 5**). Clypeus broader than long (**Figure 3**); antenna short, reaching posterior margin of tegulae (**Figure 4**), scape longer than F1 to F3 together, flagellomere equal in breadth, F1 nearly as long as broad, F2 long than broad, nearly 1.2 times as long as broad, F3-F10 equal in length, about 1.4 times as long as broad, F11 rounded apically, about 2.0 times as long as broad (**Figure 4**); ocelli normal, not enlarged, ocellocular distance greater than ocellar diameter (**Figures 3 and 4**); malar space linear, nearly absent (**Figure 1**); fore wing with three sub marginal cells, apex of marginal cell broadly rounded, and with obvious dark area at apical corner (**Figure 2**); tegulae not extending level of scuto-scutellar suture (**Figure 4**); scutum broader than long, with dense punctures (**Figure 4**); scutellum slightly emarginated posteriorly, with sparse punctures (**Figure 4**); metanotum without projections; basal area of propodeum narrow and sloping, with a series of strong pits, posterior surface of propodeum with sparse punctures, and lateral surface of propodeum with dense punctures; marginal zones of T1-T5, except near base, hairless and impunctate (**Figure 5**); hind femur slender, not expanded, smooth and concave on underside, with a broaden lamelliform projection near base (**Figure 6**); hind tibia with a triangle projection on underside near base, and with a blunt projection at apical underside (**Figure 8**); basitibial plate absent (**Figure 7**); S4 deeply emarginated posteriorly, disc of S4 with dense and fine pubescence (**Figure 9**); S5 thickened apically, lobate, with hair tufts, and with a triangle plate at median apex (**Figure 10**), S6 deeply emarginated posteriorly, with long branched hairs at both sub lateral sides (**Figure 11**); S7 transverse, with two apical projections involving four pinch of hirsute (**Figure 12**); S8 small, compact sclerite with midapical peglike projection (**Figure 13**); gonostylus double, upper gonostylus of extremely expanded, flattened and lamelliform, with a slender and narrowed lobe directed inward, lower gonostylus broaden and bifid apically (**Figures 14 and 15**). Body black (**Figure 1**); metasomal terga black, without colored bands (**Figure 5**); antenna black (**Figure 4**); tegula blackish-brown (**Figure 4**); all legs black except mediotarsus and distitarsus dark blackish-brown. Scutum and scutellum covered black hair (**Figure 4**); clypeus, periphery of antennal socket, supraclypeal area, paraocular area, vertex, genal area, episternum, metanotum, anterior surface of T1 and all legs covered with yellowish-brown hair; lateral side of propodeum covered with long yellowish-brown plumose hair; disc of T1-2 covered sparse yellowish-brown erect hair, disc of T3-6 with sparse black erect hair (**Figure 5**).

Female, BL=11.0 mm (**Figure 16**); head broader than long, HW: HL=65:56 (**Figure 18**); gena distinctly narrower than eye, GW: EW=13:27 (**Figure 16**); width of metasoma broader than the width between the tegulae, MtW: MsW=88:80 (**Figures 19 and 21**). Clypeus broader than long (**Figure 18**); ocelli normal, not enlarged, ocellocular distance greater than ocellar diameter (**Figure 18**); malar space linear, nearly absent (**Figure 16**); fore wing with three submarginal cells, apex of marginal cell broadly rounded, and with obvious dark area at apical corner (**Figure 17**); tegulae not extending level of scuto-scutellar suture (**Figure 19**); scutum broader than long, with dense punctures (**Figure 19**); scutellum straight posteriorly, with sparse punctures (**Figure 20**); metanotum without projections; basal area of propodeum narrow and sloping, with a series of strong pits, posterior surface of propodeum with sparse punctures, and lateral surface of propodeum with dense punctures (**Figure 20**); marginal zones of T1-T4, except near base, hairless and impunctate (**Figure 21**), disc of T1 with dense punctures (**Figure 20**); basitibial plate triangular and elongate, completely margined by carinae except at base (**Figure 22**); middle tibial spur with all teeth minute (**Figure 23**); outer hind tibial spur gradually tapering apically (**Figure 24**). Body black (**Figure 16**); under surface of antennal flagellomere black (**Figure 18**); tegulae blackish brown (**Figure 19**); metasomal terga black, without colored bands (**Figure 21**). Scutum and scutellum covered black hair (**Figure 19**); disc of T1-2 covered sparse short erect yellowish-brown hairs, disc of T3-5 covered sparse long erect black hairs, prepygidial fimbria blackish, complete (**Figure 21**); hind femur and outer surface of hind tibia covered with long plumose hairs (**Figure 22**); outer surface of hind basitarsus covered sparse and long hairs, but inner surface covered short and dense hairs (**Figures 21 and 24**).

Type material: Holotype: 1M#, China, Xizang, Chayu County, Zhougoin Town, Xiongjiu Village (97.28166°E, 28.60671°N), 1938m, 29.VII.2014, coll. Qing-Tao WU; paratype: 1F#, same label information as the holotype.

General distribution: China (Xizang).

Etymology: The type location Xiongjiu (Xizang, China) is given as the specific name.

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