



## RESEARCH ARTICLE - ANTS

### A New Species of the Ponerine Ant Genus *Myopias* Roger from Yunnan, China, with a Key to the Known Oriental Species

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#### Abstract

A new species of the ponerine ant genus *Myopias* Roger, 1861 collected from southwestern China is described based on morphological features. *M. daia* sp. nov. is allied to *M. luoba* Xu & Liu, 2012, but differs from the latter by the shape of the posterior head margin, eye facet number, petiolar node shape, head sculpture, body color, and total length. The new species is also allied to *M. nops* Willey & Brown, 1983 and *M. menba* Xu & Liu, 2012, but differs from the latter two species by petiolar node shape, eye facet number, and body sculpture and color. A key based on the worker caste is provided to the eleven known Oriental species of the genus for the first time.

#### Introduction

The ponerine ant genus *Myopias* Roger, 1861 is distributed in the Oriental, Indo-Australian, and Australasian regions of the world (Bolton, 1995). Before this study, 38 species were recorded in the world (Bolton, 2013). According to the distribution data of species, most species are known from New Guinea and Indonesia, while some species are distributed south to Australia, and north to China and India. Ten species are known from the Oriental region *sensu stricto*. The first of these, *M. amblyops*, was described by Roger (1861) from Sri Lanka. This was followed by *M. philippinensis* from the Philippines (Menozi, 1925), *M. lobosa* from the Philippines and *M. nops* from Taiwan, China (Willey & Brown, 1983), and *M. conicara* from China (Xu, 1998). Besides, Stitz (1925) described a subspecies, *M. bidens polita*, from the Philippines. Recently, Bharti & Wachkoo (2012) described *M. shivalikensis* from India, and

finally, Xu & Liu (2012) described *M. hania*, *M. luoba* and *M. menba* from China.

A survey of ants in Yunnan Province, China, conducted during the Queensland Chinese Academy of Sciences (QCAS) Biodiversity Project, has discovered a new species of *Myopias* described below. This brings the number of Oriental *Myopias* species to eleven. In order to identify the Oriental species and understand the differences between the new species and previously known ones, we provided a key for the worker caste based on the specimens of southwestern Chinese species, AntWeb images, and original descriptions.

#### Materials and Methods

A single worker of the new species was collected from an altitudinal transect in tropical rainforest near Bubeng Village in Mengla County, Xishuangbanna Prefecture. The transect



consisted of twenty square survey plots (20m by 20m), five plots (1-5) at each of four elevations, roughly 600, 800, 1000, and 1200 meters above sea level. At each survey plot ants were extracted from two square meters of leaf litter and from spraying the trunks of 10 large trees. But only leaf litter extraction ('Berlese') yielded the specimen of *Myopias*. Details of the methods are presented in Burwell & Nakamura (2011). The key is based on the AntWeb images available for most species, the figure and description of *M. philippinensis*, and specimens of the southwestern Chinese species.

Descriptions and measurements were made under a Jiangnan XTB-1 stereo microscope with a micrometer at 60× magnification. Illustrations of the new species were made under a Motic-700Z stereo microscope with illustrative equipment at 60× magnification. Images were captured using a Zeiss Discovery V20 stereo microscope with Zeiss AxioCam HRC CCD and Axio Vision Release 4.8.2 software.

Standard measurements and indices are as defined in Bolton (1975), with the addition of ED and MSL outlined below:

TL-Total Length: The total outstretched length of the individual, from the mandibular apex to the gastral apex.

HL-Head Length: The straight-line length of the head in perfect full-face view, measured from the mid-point of the anterior clypeal margin to the midpoint of the posterior margin. In species where one or both of these margins is concave, the measurement is taken from the mid-point of a transverse line that spans the apices of the projecting portions.

HW-Head Width: The maximum width of the head in full-face view, excluding the eyes.

CI-Cephalic Index =  $HW \times 100 / HL$ .

SL-Scape Length: The straight-line length of the antennal scape, excluding the basal constriction or neck.

SI-Scape Index =  $SL \times 100 / HW$ .

ED-Eye Diameter: The maximum diameter of the eye.

ML-Mandible Length: The straight-line length of the mandible measured from apex to the lateral base.

PW-Pronotal Width: The maximum width of the pronotum measured in dorsal view.

MSL-Mesosoma Length (=AL-Alitrunk Length): The diagonal length of the mesosoma in lateral view, measured from the point at which the pronotum meets the cervical shield to the posterior basal angle of the metapleuron.

PL-Petiole Length: The length of the petiole measured in lateral view from the anterior process to the posteriormost point of the tergite, where it surrounds the gastral articulation.

PH-Petiole Height: The height of the petiole measured in lat-

eral view from the apex of the ventral (subpetiolar) process vertically to a line intersecting the dorsalmost point of the node.

DPW-Dorsal Petiole Width: The maximum width of the petiole in dorsal view.

LPI-Lateral Petiole Index =  $PH \times 100 / PL$ .

DPI-Dorsal Petiole Index =  $DPW \times 100 / PL$ .

All measurements are expressed in millimeters.

#### KEY TO THE KNOWN ORIENTAL SPECIES OF *MYOPIAS* BASED ON WORKER CASTE

1 In full-face view, clypeus without protruding median lobe...2

- In full-face view, clypeus with protruding median lobe .....3

2 In full-face view posterior head margin straight. The first tooth of mandible counting from base located at midpoint of mandible, not hooked. Metanotal groove absent. Dorsal margin of petiolar node horizontal. The whole body surface largely sparsely punctured. Body color reddish brown (Sri Lanka) (Figs. 1-3).....*M. amblyops* Roger, 1861

- In full-face view posterior head margin weakly convex. The first tooth of mandible counting from base located before midpoint of mandible, weakly hooked. Metanotal groove deeply impressed. Dorsal margin of petiolar node descends anteriorly. The whole body surface longitudinally and somewhat irregularly rugose, vertex and cheeks of head, and pronotum largely sparsely punctured. Body color blackish brown (Philippines) (Figs. 4-6).....*M. lobosa* Willey & Brown, 1983

3 In dorsal view mandible strongly elongate and roughly linear, masticatory margin divided into a long basal portion and a short apical portion; basal portion with a large tooth, about 2 or 3 times as long as the apical portion; apical portion obliquely truncate, with 1 or 2 basal teeth and an apical tooth.....4

- In dorsal view, mandible weakly elongate and roughly triangular, masticatory margin not divided into two portions, with a large basal tooth, a large middle tooth, and 1 or 2 small apical teeth.....7

4 In full-face view, median clypeal lobe roughly rectangular, anteriorly as broad as posteriorly, lateral margins parallel or nearly parallel, anterior margin deeply or moderately concave.....5

- In full-face view, median clypeal lobe roughly trapezoidal, widened anteriorly, anterior margin slightly concave, straight or slightly convex.....6

- 5 Median clypeal lobe longer than broad. Basal portion of masticatory margin of mandible with a short blunt tooth. In dorsal view petiolar node as broad as long, lateral margins parallel. The whole body surface sparsely coarsely punctured; mesonotum, propodeum and petiole longitudinally striate (Philippines). . . . . *M. philippinensis* Menozzi, 1925
- Median clypeal lobe broader than long. Basal portion of masticatory margin of mandible with a long acute tooth. In dorsal view petiolar node longer than broad, narrowed anteriorly. The whole body surface smooth and shining (Philippines, Indonesia) (Figs. 7-9). . . . . *M. bidens* (Emery, 1900)
- 6 In full-face view apices of scapes reach or slightly surpass posterior head corners. In lateral view ventral margin of subpetiolar process nearly straight posterior to anteroventral tooth. In dorsal view petiolar node about as broad as long. Sides of petiole and gaster sparsely punctured or smooth (China: Yunnan) (Figs. 10-12). . . . . *M. conicara* Xu, 1998
- In full-face view apices of scapes not reaching posterior head corners. In lateral view ventral margin of subpetiolar process evenly convex posterior to anteroventral tooth. In dorsal view petiolar node broader than long. Sides of petiole and gaster largely abundantly punctured (China: Yunnan) (Figs. 13-15). . . . . *M. hania* Xu & Liu, 2012
- 7 In lateral view petiolar node roughly trapezoidal, distinctly narrowed dorsally, posterodorsal corner rounded, without distinct angle. Eyes absent or very small, with less than three facets. . . . . 8
- In lateral view petiolar node roughly rectangular, slightly or not narrowed dorsally, posterodorsal corner bluntly angled, with distinct angle. Eyes larger, with more than nine facets. . . . . 10
- 8 In full-face view posterior head margin strongly angularly concave. In lateral view dorsal margin of petiolar node weakly convex (India) (Figs. 16-18). . . . . *M. shivalikensis* Bharti & Wachkoo, 2012
- In full-face view posterior head margin straight. In lateral view dorsal margin of petiolar node straight. . . . . 9
- 9 In full-face view apex of scape almost reaching posterior head corner. Eyes absent. In lateral view subpetiolar process ventrally pointed. In dorsal view, petiolar node distinctly broader than long. Head, mesosoma and petiole finely reticulate. (China: Taiwan) (Figs. 19-21). . . . . *M. nops* Willey & Brown, 1983
- In full-face view apex of scape fails to reach posterior head corner by apical scape width. Eyes present, with 2 facets. In lateral view subpetiolar process anteroventrally pointed. In dorsal view petiolar node about as broad as long. Head, mesosoma and petiole densely punctured (China: Tibet) (Figs. 22-24). . . . . *M. menba* Xu & Liu, 2012
- 10 Eye with 6 facets in the maximum diameter. In lateral view petiolar node not narrowed dorsally, anterior and posterior margins parallel. Subpetiolar process anteroventrally pointed, anterior margin nearly vertical, posterior margin weakly concave. In dorsal view posterior margin of petiolar node straight. Head densely finely punctured. Body color blackish brown (China: Tibet) (Figs. 25-27). . . . . *M. luoba* Xu & Liu, 2012
- Eye with 3 facets in the maximum diameter. In lateral view petiolar node weakly narrowed dorsally, anterior and posterior margins not parallel. Subpetiolar process ventrally pointed, anterior margin oblique, posterior margin weakly sinuate. In dorsal view posterior margin of petiolar node weakly concave. Head smooth and shining. Body color reddish brown (China: Yunnan) (Figs. 28-34). . . . . *M. daia* sp. nov.

## DESCRIPTION OF NEW SPECIES

*Myopias daia* sp. nov.

(Figs. 28-34)

**Holotype worker:** TL 4.3, HL 0.93, HW 0.73, CI 79, SL 0.63, SI 86, ED 0.07, ML 0.60, PW 0.59, MSL 1.40, PL 0.40, PH 0.53, DPW 0.40, LPI 133, DPI 100.

In full-face view head roughly rectangular, longer than broad. Posterior margin straight, posterior corners bluntly angled. Sides weakly convex. Mandible elongate triangular, inner margin about 1/3 length of masticatory margin, basal corner bluntly angled; masticatory margin with a large basal tooth, a large middle tooth, a small preapical tooth, and a small apical tooth. Median clypeal lobe trapezoidal and widened forward, broader than long, length : width = 3:4, anterior margin weakly convex. Antenna 12-segmented, apex of scape fails to reach posterior head corner by 1/2 apical scape width. Eye small, with 9 facets, located at anterior 1/4 of the head side.

In lateral view dorsal outline of mesosoma weakly convex and gently descends posteriorly. Pronotum weakly convex. Promesonotal suture slightly impressed. Mesonotum straight. Metanotal groove weakly narrowly impressed. Dorsum of propodeum straight, rounding into declivity; declivity nearly straight, about 1/2 length of dorsum. Petiolar node nearly rectangular, weakly narrowed dorsally, anterior margin slightly concave, posterior margin slightly convex, dorsal margin weakly convex; anterodorsal corner bluntly angled, posterodorsal corner rounded. Subpetiolar process roughly triangular, ventrally pointed, both anterior and posterior margins oblique, anterior margin short and straight, posterior margin weakly sinuate. Constriction between abdominal segments III & IV distinct. Sting extruding.

In dorsal view, pronotum widened posteriorly, sides convex. Sides of propodeum straight and parallel. Petiolar node trapezoidal, narrowed anteriorly, weakly broader than long, length : width = 1:1.3; anterior and lateral margins weakly convex, posterior margin weakly concave; anterolateral corners broadly rounded, posterolateral corners narrowly rounded.

The whole body surface smooth and shining. Mandibles smooth and shining. Head with sparse erect to suberect hairs and abundant erect to suberect pubescence. Mesosoma, petiole, and gaster with sparse erect to suberect hairs and abundant subdecumbent to decumbent pubescence. Scapes and tibiae with sparse suberect hairs and dense decumbent pubescence. Body color reddish brown. Mandibles, antennae, legs, and gastral apex yellowish brown. Eyes blackish brown.

**Holotype:** worker, China: Yunnan Province, Mengla County, Mengla Town, Bubeng Village, QCAS 1000-5, 21.621°N, 101.574°E, 985m, July 2012, collected in rainforest through Berlese method, Chris J. Burwell & Aki Nakamura leg., No. A12-1820. The holotype specimen is deposited in the Insect Collection, Southwest Forestry University (SWFU), Kunming, Yunnan Province, China.

**Comparative notes:** This new species is allied to *M. luoba* Xu & Liu, 2012, but differs from the latter by having straight posterior head margin in full-face view. Eye with 3 facets in the maximum diameter. In lateral view petiolar node weakly narrowed dorsally, anterior and posterior margins not parallel. Subpetiolar process ventrally pointed, anterior margin oblique, posterior margin weakly sinuate. In dorsal view posterior margin of petiolar node weakly concave. Head smooth and shining. Body color reddish brown. Total length 4.3 mm. While in *M. luoba*, posterior head margin slightly concave in fullface view. Eye with 6 facets in the maximum diameter. In lateral view petiolar node not narrowed dorsally, anterior and posterior margins parallel. Subpetiolar process anteroventrally pointed, anterior margin nearly vertical, posterior margin weakly concave. In dorsal view posterior margin of petiolar node straight. Head densely finely punctured. Body color blackish brown. Total length 3.8 mm

The new species is also allied to *M. nops* Willey & Brown, 1983 and *M. menba* Xu & Liu, 2012, but differs from the latter two species by petiolar node slightly narrowed dorsally in lateral view, posterodorsal corner bluntly angled, with distinct angle. Eyes larger, with nine facets. Head, mesosoma and petiole smooth and shining. Body color reddish brown. While in the latter two species, their petiolar node distinctly narrowed dorsally in lateral view, posterodorsal corner rounded, without distinct angle. Eyes absent or very small, with only two facets. Head, mesosoma and petiole finely reticulate or densely punctured. Body color brownish yellow.

**Etymology:** The specific epithet has been named after a minority group called “Dai”, residing in the Bubeng village locality, Yunnan Province, China.

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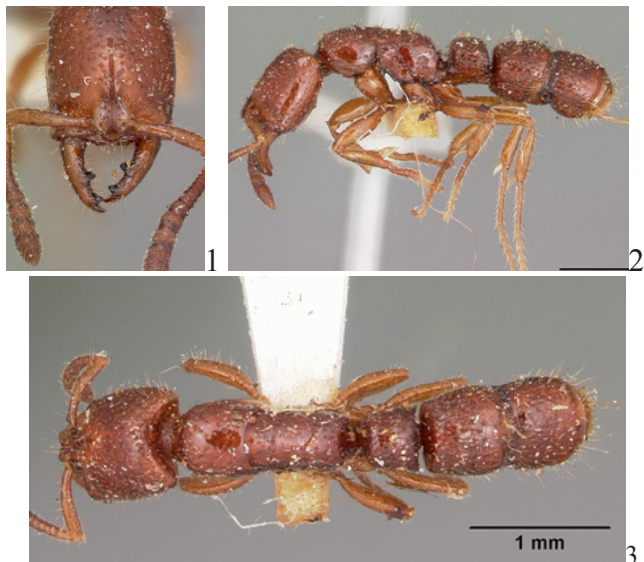
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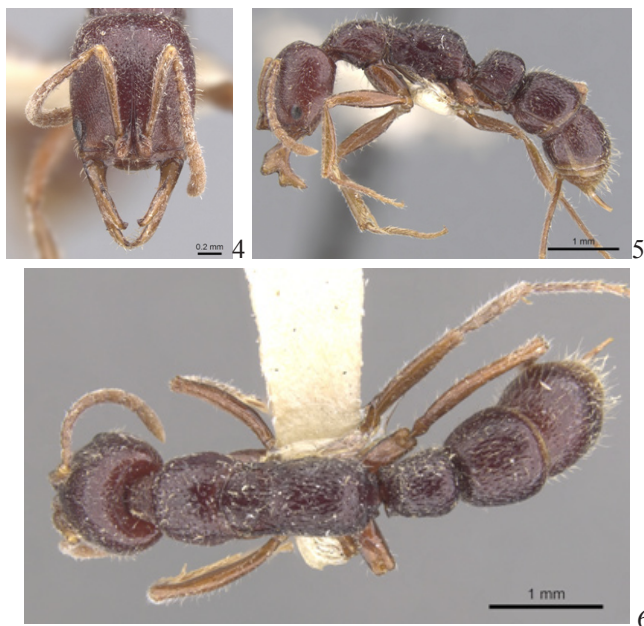
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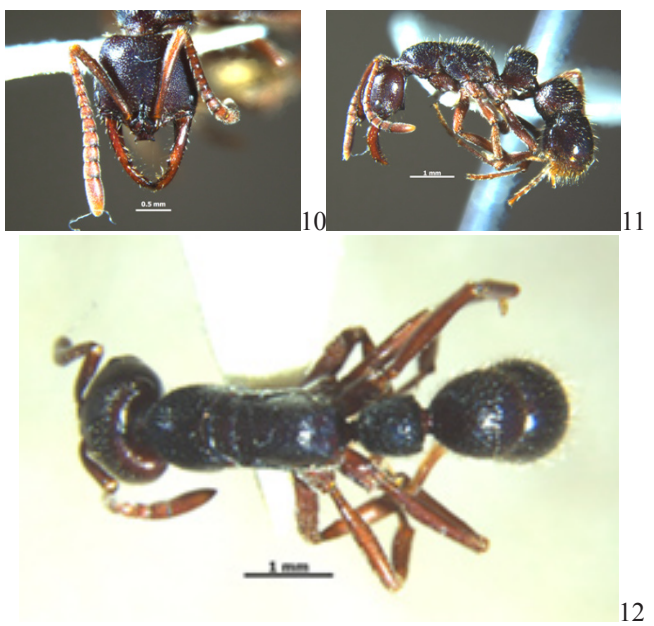
Figs. 1-3: Worker of *Myopias amblyops*; 1. Head in full-face view; 2. Body in profile view; 3. Body in dorsal view. (Cited from AntWeb, CASENT0104584)



Figs. 4-6: Worker of *Myopias lobosa*; 4. Head in full-face view; 5. Body in profile view; 6. Body in dorsal view. (Cited from AntWeb, CASENT0902528)



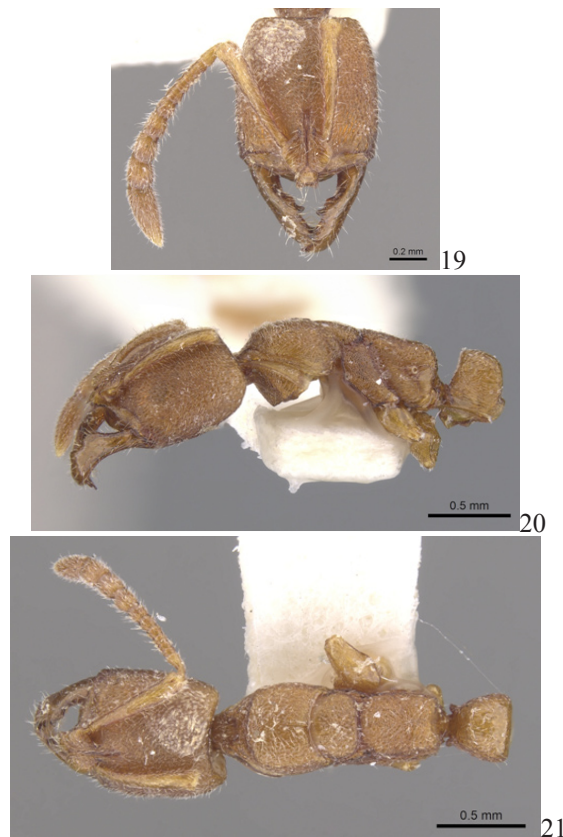
Figs. 7-9: Worker of *Myopias bidens*; 7. Head in full-face view; 8. Body in profile view; 9. Body in dorsal view. (Cited from AntWeb, CASENT0903924)



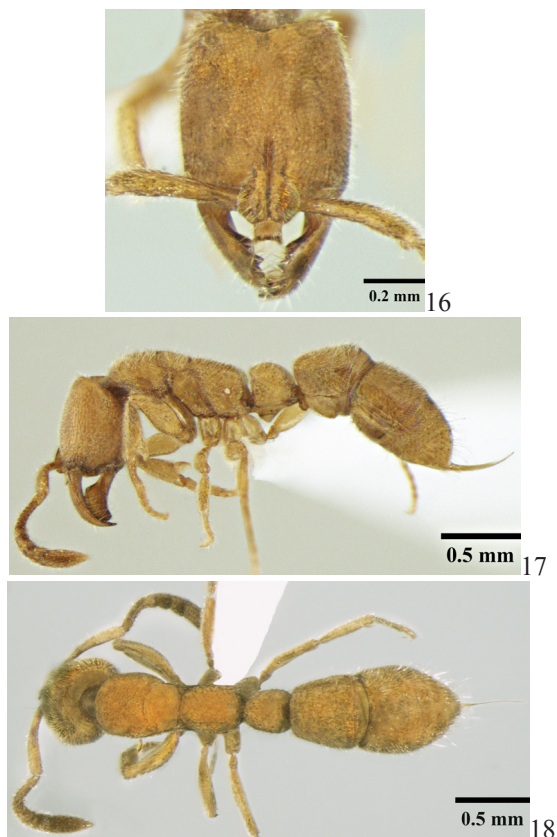
Figs. 10-12: Holotype worker of *Myopias conicaria*; 10. Head in full-face view; 11. Body in profile view; 12. Body in dorsal view. (Photo by Z. Xu & X. Zhang)



Figs. 13-15: Holotype worker of *Myopias hania*; 13. Head in full-face view; 14. Body in profile view; 15. Body in dorsal view. (Photo by Z. Xu & X. Zhang)



Figs. 19-21: Worker of *Myopias nops*; 19. Head in full-face view; 20. Body in profile view; 21. Body in dorsal view. (Cited from AntWeb, CASENT0902527).

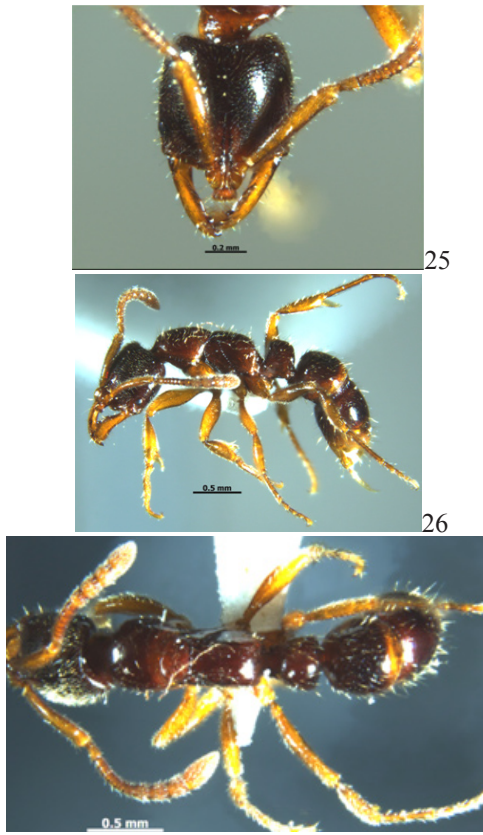


Figs. 16-18: Worker of *M. shivalikensis*; 16. Head in full-face view; 17. Body in lateral view; 18. Body in dorsal view (Cited from AntWeb, Photo by H. Bharti & A. A. Wachkoo)

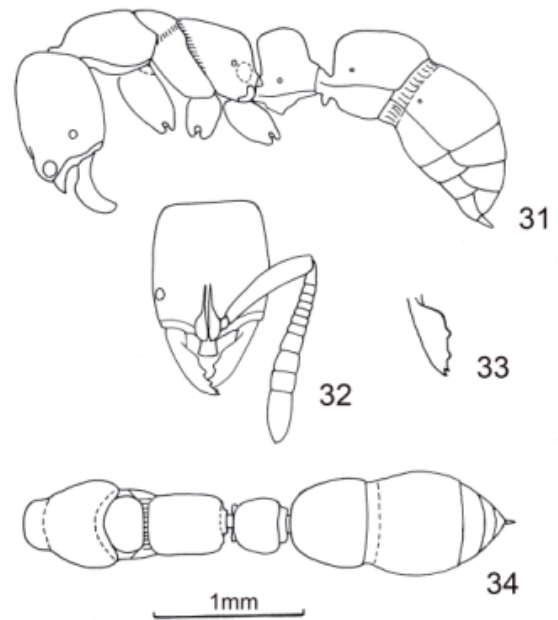


Figs. 22-24: Holotype worker of *Myopias menba*; 22. Head in fullface view; 23. Body in profile view; 24. Body in dorsal view. (Photo by Z. Xu & X. Zhang)

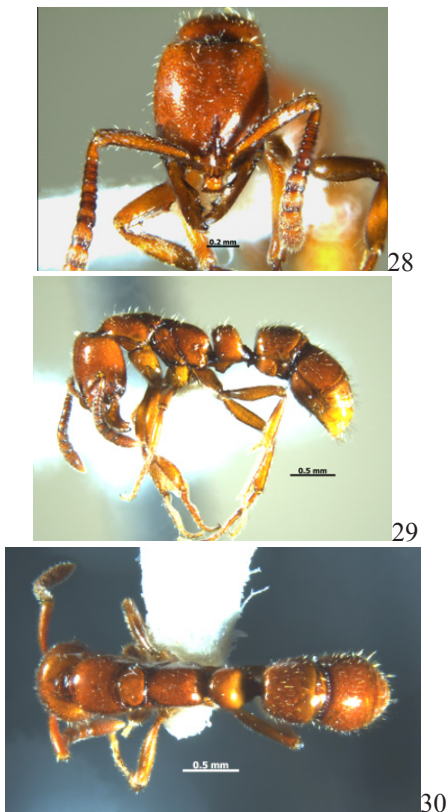




Figs. 25-27: Holotype worker of *Myopias luoba*; 25. Head in fullface view; 26. Body in profile view; 27. Body in dorsal view. (Photo by Z. Xu & X. Zhang)



Figs. 31-34: Illustrations of *Myopias daia* worker; 31. Body in lateral view; 32. Head in full-face view; 33. Mandible in dorsal view; 34. Body in dorsal view (Illustrated by Z. Xu)



Figs. 28-30: Holotype worker of *Myopias daia*; 28. Head in fullface view; 29. Body in profile view; 30. Body in dorsal view. (Photo by Z. Xu & X. Zhang)

