

Taxonomy of the myrmicine ant genus *Sylophopsis* Santschi, 1915 (Hymenoptera: Formicidae) from China, with descriptions of two new species

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Abstract

The Chinese members of the myrmicine genus *Sylophopsis* Santschi, 1915 were revised based on the worker caste, including one known species, *Sylophopsis sechellensis* (Emery, 1894), and two new species, *S. brevidorsa* **sp. nov.** and *S. magnocula* **sp. nov.** A key for all three known Chinese species of *Sylophopsis* is also provided based on the worker caste.

Key words: new species, key, Solenopsidini, Myrmicinae

Introduction

The genus *Sylophopsis* was originally established by Santschi (1915) based on the type species *Sylophopsis modesta*. Bolton (1987) later synonymized it with *Monomorium* Mayr, 1855. However, the genus was reinstated by Ward *et al.* (2015) based on molecular data from 11 nuclear gene fragments, although their study provided only weak support for the monophyly of the genus. Over the past two decades, significant contributions to the classification of this genus have been made by several scholars. Heterick (2006) described five new species and established the *hildebrandti* group from Madagascar. Sharaf (2007) added one new species from Egypt. Sharaf & Aldawood (2013) and Aldawood (2016) each described two new species from Saudi Arabia. Akbar *et al.* (2021) described one new species from India. Currently, a total of twenty-two valid species are known in this genus, which are distributed across eight zoogeographic regions as defined by Holt *et al.* (2013): Afrotropical (*S. cryptobia*, *S. elgonensis*, *S. jonesi*, *S. malamixta*, *S. modesta*, *S. sersalata*, *S. thrascolepta*), Australian (*S. australica*, *S. sechellensis*, *S. subcoeca*), Madagascan (*S. adistolon*, *S. aureorugosa*, *S. cryptobia*, *S. ferodens*, *S. fisheri*, *S. gongromos*, *S. hildebrandti*, *S. infusca*, *S. modesta*), Oceanian (*S. australica*, *S. sechellensis*, *S. vitiensis*), Oriental (*S. australica*, *S. peetersi*, *S. sechellensis*, *S. subcoeca*), Panamanian (*S. sechellensis*, *S. subcoeca*), Saharo-Arabian (*S. cryptobia*, *S. dentata*, *S. kondratieffi*, *S. saudiensis*, *S. sechellensis*), Sino-Japanese (*S. sechellensis*).

This paper recognizes *Sylophopsis sechellensis* (Emery, 1894) as a known species and describes two new species of *Sylophopsis* from China. Additionally, a key to the known Chinese species of *Sylophopsis* based on the worker caste is provided.

Materials and methods

Specimens were collected manually from the ground using a small hoe, and have been deposited in repositories identified by the following acronyms: (1) GXNU (Insect Collection, Guangxi Normal University, Guilin, China);

(2) SWFU (Insect Collection, Southwest Forestry University, Kunming, China); (3) IZCAS (Institute of Zoology, Chinese Academy of Sciences, Beijing, China). Examination of the specimens was conducted using a Leica M205A stereomicroscope. The KEYENCE (VHX-6000) digital imaging system generated high-quality multi-focused montage images. All measurements are expressed in millimeters. Standard measurements and indices are as defined in Bolton (1987):

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

HW—Maximum width of the head in full-face view, excluding the eyes.

CI—Cephalic index = $HW \times 100 / HL$.

SL—Straight-line length of the antennal scape, excluding the basal constriction or neck.

SI—Scape index = $SL \times 100 / HW$.

ED—Maximum diameter of eye.

MSL—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.

PW—Maximum width of pronotum measured in dorsal view.

PL—Length of the petiole (abdominal segment II) measured in lateral view from the anterior process to the posteriormost point of the tergite, where it surrounds the gastral articulation.

PH—Height of the petiole measured in lateral view from the apex of the ventral (subpetiolar) process vertically to a line intersecting the dorsalmost point of the node.

DPW—Maximum width of petiole in dorsal view.

LPI—Lateral petiole index = $PH \times 100 / PL$.

DPI—Dorsal petiole index = $DPW \times 100 / PL$.

TL—Total outstretched length of the individual, from the mandibular apex to the gastral apex.

Taxonomy

Genus *Syllophopsis* Santschi, 1915

Syllophopsis Santschi, 1915: 259 [as subgenus of *Monomorium*]; Santschi, 1921: 119; Bolton, 1987: 287 [as a junior synonym of *Monomorium*]; Ward *et al.*, 2015: 13 [valid genus].

Diagnosis of worker (modified from Bolton, 1987): (1) monomorphic, or with weak size variation; (2) mandibles triangular, armed with 4-5 teeth; (3) median clypeal portion generally with a distinct pair of longitudinal carinae that project anteriorly as a pair of blunt teeth; (4) frontal lobes covered antennal sockets, frontal carina absent; (5) antennae with 12 segments, terminating in a large club of 3 segments; (6) Eyes $0 \leq 100$ ommatidia; (7) head longer than broad, smooth and shining; (8) promesonotal suture absent; metanotal groove impressed, sometimes less-developed but distinct; (9) propodeal dorsum meeting declivity usually in an obtuse angle or weakly denticulate at the junction; (10) petiole with a long anterior peduncle, postpetiolar node smaller and lower than petiolar node in lateral view.

Key to Chinese species of *Syllophopsis* based on the worker caste

1. Eye width greater than or almost equal to the minimum width of antennal scapes *S. magnocula* sp. nov.
- Eye width significantly smaller than the minimum width of antennal scapes 2
2. Mesopleuron with reticulation *S. sechellensis*
- Mesopleuron smooth and shining. *S. brevidorsa* sp. nov.

***Syllophopsis brevidorsa* sp. nov.**

Fig. 1

Material examined. **Holotype** worker: CHINA: *Chongqing*: Wuxi County, Yintiaoling Nature Reserve, Shuanghe Village, 873 m, 31.4352° N, 109.8489° E, 21.VI.2022, Defu Chen leg., No. GXNU220646 [GXNU]; **Paratypes**: same data as holotype [5 workers, GXNU]; *Guangxi*: Guilin City, Longsheng County, Huaping Village, 1441 m, 25.6531° N, 109.9339° E, 4. VIII.2019, Gaosong Huang leg., No. GXNU19123 [1 worker, GXNU; 1 worker, SWFU; 1 worker, IZCAS].

Diagnosis. Yellowish species. Eyes absent or with a single ommatidium. Propodeal dorsum at the same level as promesonotum, and as long as propodeal declivity. Petiolar node in lateral view cone-shaped, with a rounded dorsum.

Holotype worker. HL 0.48, HW 0.38, CI 79, SL 0.38, SI 100, ED 0, MSL 0.56, PW 0.26, PL 0.22, PH 0.15, DPW 0.15, LPI 68, DPI 50, TL 2.08.

Paratype workers. HL 0.44–0.49, HW 0.35–0.40, CI 77–86, SL 0.37–0.40, SI 98–102, ED 0–0.01, MSL 0.52–0.59, PW 0.20–0.22, PL 0.21–0.23, PH 0.14–0.16, DPW 0.14–0.15, LPI 67–70, DPI 8–52, TL 2.01–2.12 (n=8).

Head. Rectangular in full-face view (CI 77–86), longer than broad, with convex lateral margins and straight posterior margin, posterolateral corners rounded. Masticatory margin of mandible with four teeth, apical tooth larger than the remaining three teeth, third and fourth teeth the same size, basal tooth slightly smaller than subbasal tooth. Anterior margin of clypeus rounded, with weak clypeal carinae. Frontal carinae short and divergent posteriorly; antennae with 12 segments, scapes when laid back from their insertions just reaching occipital margin. Eyes absent or reduced to single ommatidium, situated at the midlength of head laterally. **Mesosoma.** In lateral view, dorsal outline of promesonotum weakly convex; metanotal groove impressed; dorsum of propodeum straight, at the same level as promesonotal dorsum, and as long as declivity, forming an obtuse angle with declivity. In dorsal view, pronotum suborbicular, obviously constricted at metanotal groove, lateral sides of declivity with carinae. **Metasoma.** Petiolar node in lateral view cone-shaped, with a rounded dorsum. Postpetiole lower than petiole in lateral view, dorsum convex. Gaster oval. **Sculpture.** Body smooth and shining, except for the lower part of the metapleuron with a few longitudinal striae. **Pilosity.** Body covered with abundant suberect hairs. **Color.** Body yellow.

Distribution. China (Guangxi, Chongqing).

Etymology. The specific epithet *brevidorsa* (Latin: *brevi*- = short, *-dorsa* = dorsum) refers to the characteristically short propodeal dorsum, a key diagnostic feature of this species.

Notes. This species closely resembles *S. sechellensis* in morphology but can be distinguished by the following characteristics: In full-face view, the posterior margin of the head of this new species is straight or slightly convex, whereas in *S. sechellensis* it is concave. The antennae of this new species are adorned with subdecumbent long hairs and lack erect hairs, whereas *S. sechellensis* possesses abundant erect hairs. In lateral view, the mesopleura of this new species is smooth and shining, whereas in *S. sechellensis* it exhibits coarse reticulation. In lateral view, the petiolar node of this new species is hemispherical, whereas in *S. sechellensis* it is triangular.

***Syllophopsis magnocula* sp. nov.**

Fig. 2

Material examined. **Holotype** worker: CHINA: *Guangxi*: Guilin City, Longsheng County, Huaping Village, 1441 m, 25.6531° N, 109.9339° E, 4.VIII.2019, Gaosong Huang leg., No. GXNU192144 [GXNU]; **Paratypes**: same data as holotype [4 workers, GXNU; 1 worker, SWFU; 1 worker, IZCAS].

Diagnosis. Body smooth and shining, except for lower part of declivity of propodeum with a few striae; diameter of eyes wider than the greatest width of antennal scape; dorsum of propodeum as long as declivitous face; postpetiolar node nearly hemispherical.

Holotype worker. HL 0.63, HW 0.53, CI 84, SL 0.51, SI 96, ED 0.09, MSL 0.76, PW 0.37, PL 0.32, PH 0.23, DPW 0.17, LPI 71, DPI 53, TL 2.93.

Paratype workers. HL 0.54–0.68, HW 0.45–0.57, CI 93–98, SL 0.46–0.55, SI 93–102, ED 0.08–0.09, MSL 0.70–0.78, PW 0.35–0.38, PL 0.30–0.35, PH 0.22–0.23, DPW 0.16–0.18, LPI 70–73, DPI 50–55, TL 2.91–3.21 (n=6).

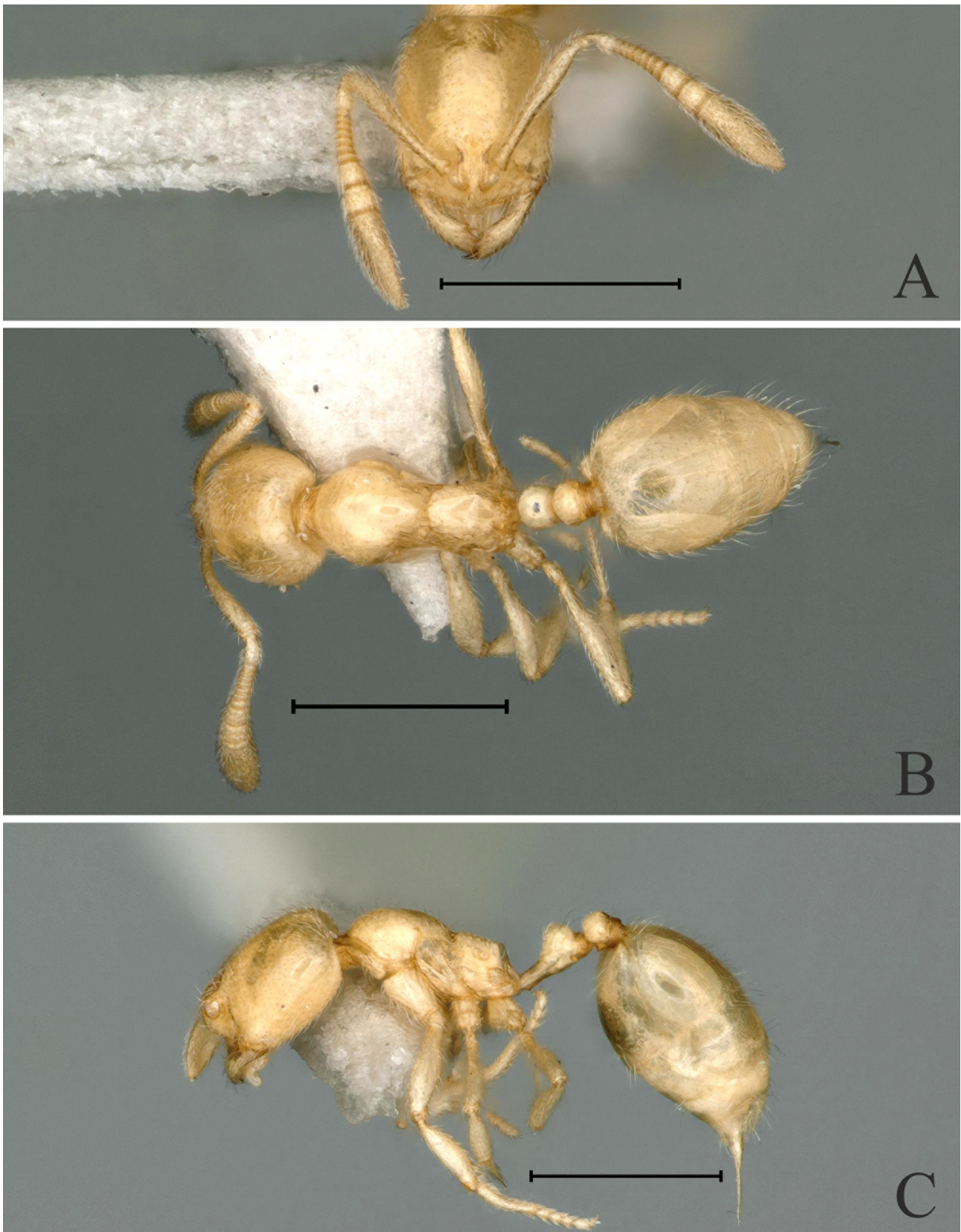


FIGURE 1. *Sylophopsis brevidorsa* **sp. nov.**, holotype worker (Photographed by Zhilin Chen). **A.** Head in full-face view. **B.** Body in dorsal view. **C.** Body in lateral view. Scale bars = 500 μ m.

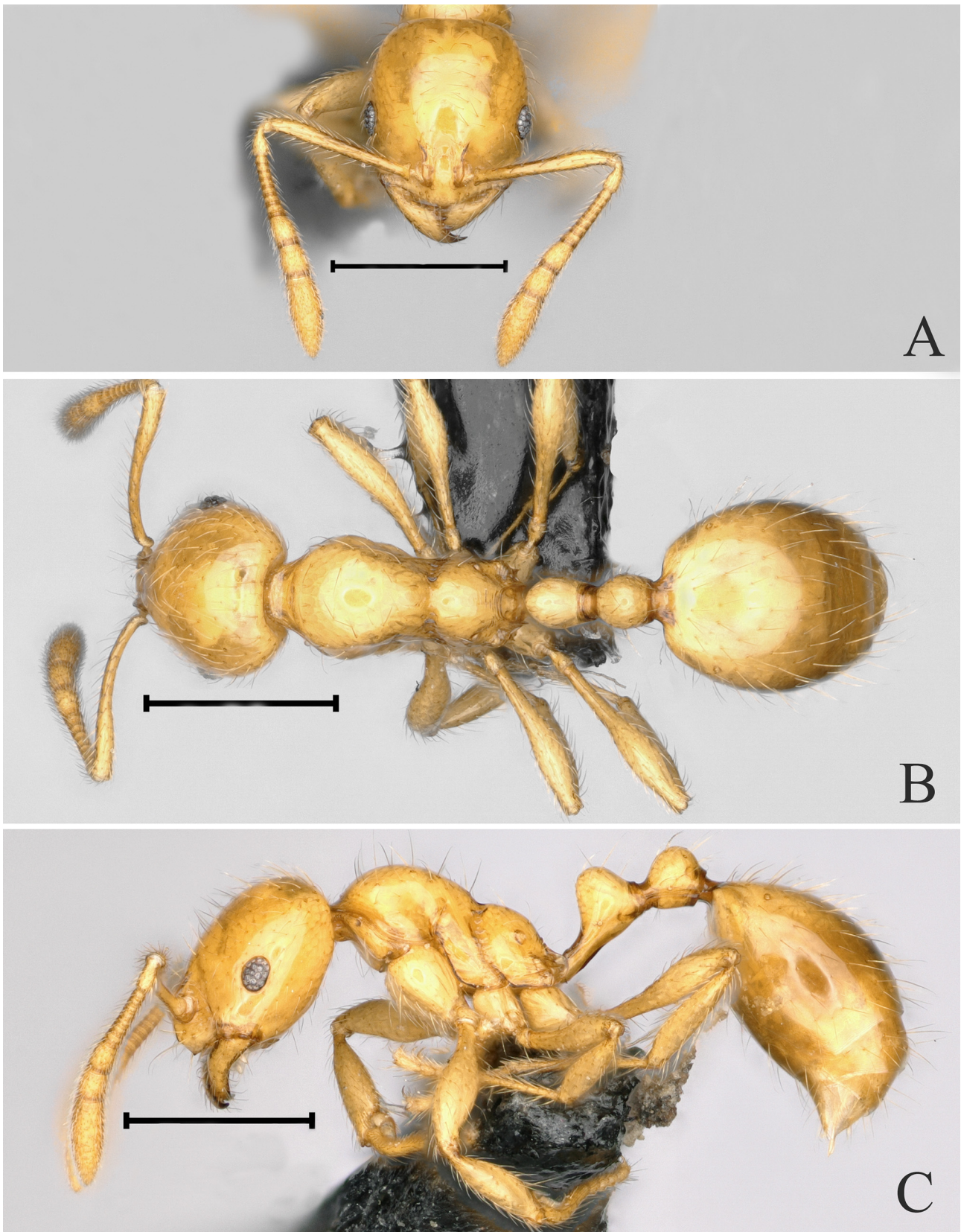


FIGURE 2. *Sylophopsis magnocula* **sp. nov.**, holotype worker (Photographed by Zhilin Chen). **A.** Head in full-face view. **B.** Body in dorsal view. **C.** Body in lateral view. Scale bars = 500 μ m.

Head. Rectangular in full-face view (CI 93–98), with evenly convex lateral margins and weakly convex posterior margin, posterolateral corners rounded. Masticatory margin of mandible with five teeth, apical teeth larger than the remaining four teeth, and the remaining four teeth with the same size. Anterior margin of clypeus rounded, with weakly clypeal carinae. Frontal carinae short, and divergent posteriorly; antennae with 12 segments, scapes when laid back from their insertions just reaching to occipital margin. Eyes large, with 18 ommatidia, situated at the midlength of head side. **Mesosoma.** In lateral view, dorsal outline of promesonotum evenly convex; metanotal groove deeply impressed; dorsum of propodeum lower than promesonotal dorsum, and as long as declivity of propodeum, posterodorsal corners rounded. In dorsal view, dorsum of propodeum convex, conspicuous constriction at metanotal groove. **Metasoma.** Petiolar node in lateral view subhemispherical, ventral margin of petiole almost straight. Postpetiolar node nearly hemispherical, almost at the same size as with petiole, dorsum convex, ventral margin straight, and anteroventral corner rounded, not forming prominent angles. Gaster fusiform. **Sculpture.** Body smooth and shining, except for the lower part of declivity of propodeum with a few striae. **Pilosity.** Body covered with abundant suberect long hairs. **Color.** Body yellow, except for the posterior part of the gaster yellowish-brown.

Notes. This new species is very similar to *S. peetersi* but can be separated from *S. peetersi* by the following combination of characteristics: diameter of eyes wider than greatest width of antennal scape; dorsum of propodeum as long as declivitous face.

Distribution. China (Guangxi).

Etymology. The specific epithet *magnocula* (Latin: *magnus* = large, *oculus* = eye) refers to the characteristically well-developed eyes, a key diagnostic feature distinguishing this species from its congeners with reduced or absent eyes.

Syllophopsis sechellensis (Emery, 1894)

Fig. 3

Monomorium fossulatum subsp. *sechellense* Emery, 1894: 69, FIGURE (w.q.) SEYCHELLES IS (Marie–Anne I.). Junior synonym of *fossulatum*: Wilson & Taylor, 1967: 64. Status as species: Bolton, 1995: 266. Combination in *Syllophopsis*: Ward, *et al.* 2015: 73. [Lectotype worker images examined, from <https://www.antweb.org>, CASENT0008631, imaged by April Nobile].

Material examined. 2 workers: CHINA: *Guangxi*: Guilin City, Longsheng County, Huaping Village, 1223 m, 25.6532° N, 109.9337° E, 6. VIII.2019, Zhilin Chen leg., No. GXNU192199 [2 workers, GXNU].

Diagnosis. Body yellow. Head in full-face view rectangular, posterior margin weakly concave in middle; antennal scape nearly or just reaching to occipital margin; eyes reduced to 1–2 ommatidium. In lateral view, dorsum of promesonotum flattened, promesonotum on the same plane as propodeum, metanotal groove strongly depressed, propodeal angle produced as short denticle. In lateral view, petiolar node triangular; postpetiolar node sloped forward, the dorsum of postpetiole broadly rounded, posterodorsal corner rounded. Head smooth and shining; dorsum of promesonotum smooth and shining, except for lower mesopleuron strongly punctate or reticulate; metanotal groove with distinct transverse costulae; propodeum shining, declivitous face of propodeum with weak to strong striae, metapleuron also with weak to strong striae.

Distribution. China (Taiwan, Guangxi, Hainan), Australia, Barbados, Borneo, Comoros, Cambodia, Indonesia, Fiji, Grenada, Guam, Japan, Malaysia, Micronesia, New Guinea, Northern Mariana Islands, Myanmar, Saint Helena, Samoa, Seychelles, Singapore, Thailand, Tonga, Vietnam.

Discussion

Syllophopsis, widely distributed in tropical and subtropical regions, poses challenges for morphological classification due to the small size and elusive nature of its species, exacerbated by the lack of a comprehensive species key. Sparks *et al.* (2019) identified *Syllophopsis* as polyphyletic, emphasizing the need for a molecular data-based revision. Comparative observations reveal distinct morphological features within *Syllophopsis*: (1) Significant variation in eye size is evident across species; (2) Mandibular teeth count ranges from 3 to 5; (3) In lateral view, the anteroventral corner of the postpetiolar sternite shows variable tooth-like structures; (4) The presence of a

dorsaloposterior corner on the posterior ventral plate of the propodeum varies; (5) Species like *S. magnocula* and *S. peetersi* exhibit a narrowly connected postpetiole to the gaster, contrasting with other species. These findings suggest that *Syllophopsis* may not be a monophyletic group, a conclusion supported by Sparks *et al.* (2019). Future research incorporating comprehensive molecular data is expected to confirm these hypotheses.

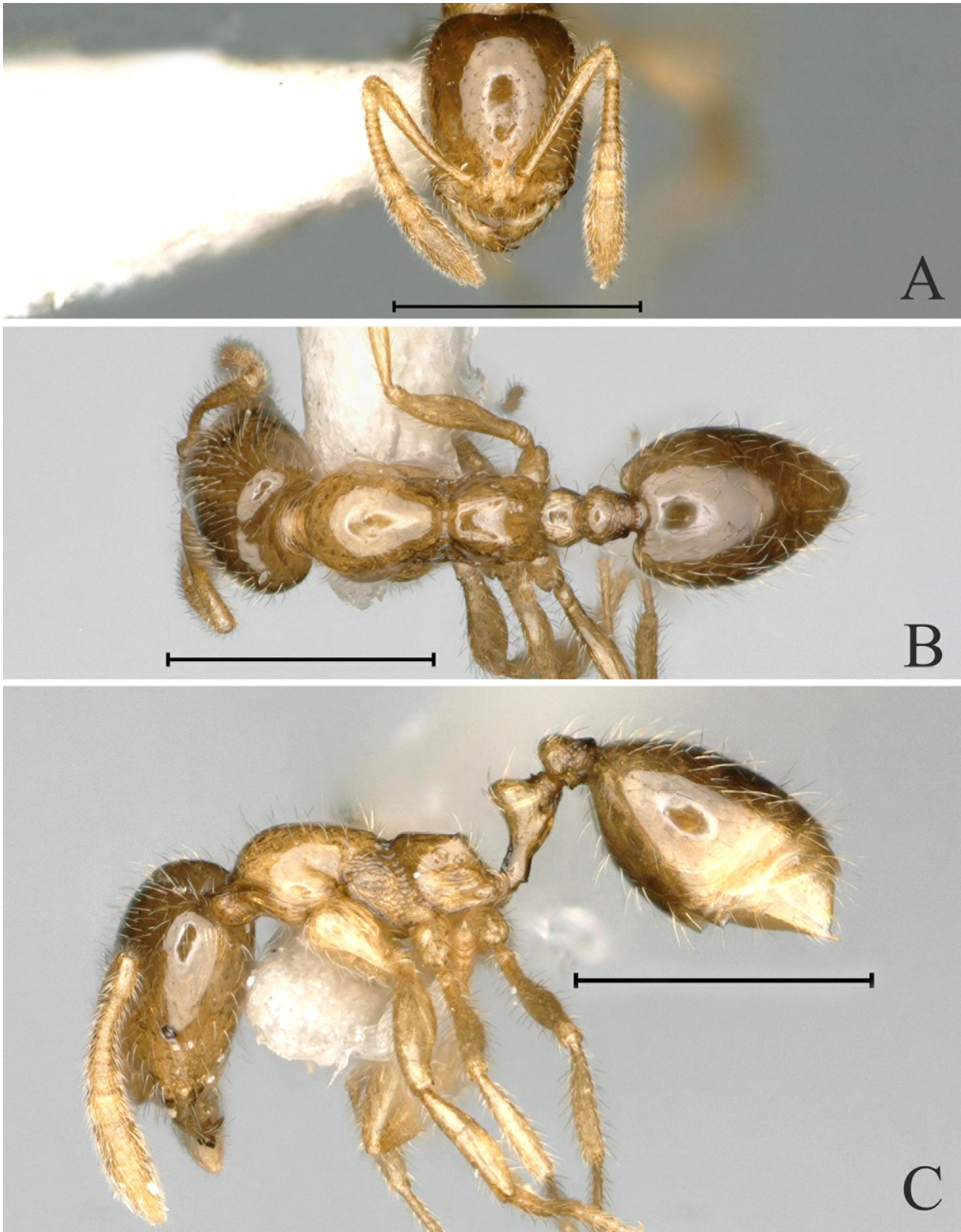


FIGURE 3. *Syllophopsis sechellensis*, worker (Photographed by Zhilin Chen). **A.** Head in full-face view. **B.** Body in dorsal view. **C.** Body in lateral view. Scale bars = 500 μ m.

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