

Three new species of the ant genera *Ooceraea* and *Syscia* (Hymenoptera: Formicidae: Dorylinae) from Sabah, Borneo

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ABSTRACT. Two new species of *Syscia* and one new species of *Ooceraea* (Hymenoptera, Formicidae) are described from Sabah, Borneo, East Malaysia. The queens available for two species of *Syscia*, and the male of one *Syscia* species are described. The brachypterous queen of *S. yekzoeae* has large eyes, a complete set of ocelli, a normal female thorax, and vestigial wings with no closed cell. This represents the first record of a brachypterous *Syscia* queen from the Old World. A short note on the behavior of *Syscia yekzoeae* sp. nov. is presented based on observations of a laboratory colony.

Keywords Taxonomy, new species, natural history, doryline ants, phasic reproduction, Borneo, Sundaland
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INTRODUCTION

The taxonomic system of the subfamily Dorylinae of the Formicidae (ants) has been drastically reorganized to include the former Cerapachyinae, and currently the subfamily consists of 27 extant genera world-wide (Borowiec 2016, 2019; Bolton 2024). Most of the genera are confined to either the New World or Old World. Sixteen genera occur in the latter, most of which are found in the Oriental (sensu lato) and/or Ethiopian regions including Madagascar.

Among the thirteen doryline genera known in Asia, *Ooceraea* has been recorded from Oceania (Australia, New Guinea and Fiji) and tropical/subtropical Asia, with a single tramp species, *O. biroi* (Forel, 1907), which spread throughout tropical and subtropical areas of the world. All of the 12 known Oriental species have

been described/recorded from Sri Lanka and continental Asia such as India, China and Indochina (e.g., Bharti et al. 2021; AntWiki 2024; Gao et al. 2024). Thus, information on the Sundaland species has been very poor (the type locality of *O. biroi* is Singapore). Although Yamane et al. (2021) recorded three species from Sarawak, Borneo, most Sundaland species remain to be named.

The genus *Syscia* is closely related to *Ooceraea* and shows an exception in distribution pattern among the doryline genera, being found in both the New and Old World. (Borowiec 2016). Only five species were known world-wide at the time of Borowiec (2016), and most of the known species were described after 2020. Until recently, the majority (34) of the 42 described species of *Syscia* had been known from Central and South America, only seven being recorded from Asia (see Jaitrong et al. 2020); records of ‘*Syscia*’ from

China often included misidentifications. However, Du et al. (2024) recorded three species from China, including two new species (the remaining species, *S. guizhoensis* (Zhou, 2006), was transferred from *Cerapachys*). Although the number of *Syscia* species in Asia has increased to ten, according to our knowledge many more species exist in Southeast Asia. For example, Yamane et al. (2021) recorded three unidentified species of *Syscia* from Lambir Hills National Park in Sarawak, Borneo. More than seven species of *Syscia* and many more of *Ooceraea*, *Parasyscia*, *Lioponera* etc. are recognized among our collection from Sundaland, but for most species the material is not enough for taxonomic revisions.

In this paper, one new species of *Ooceraea* and two new species of *Syscia* are described from Sabah, Borneo. We also provide a short biological note on *S. yekzoeae* sp. nov. under laboratory rearing.

MATERIAL AND METHODS

The material was collected under the supervision of Dr. Maryati Mohamed, then Professor at Malaysia Sabah University, and Dr. Yek Sze Huei of the Institute of Tropical Biology and Conservation (ITBC), Malaysia Sabah University. All the holotypes and part of the paratypes of the new species will be deposited at BORNEENSIS, ITBC, Malaysia Sabah University; remaining paratypes will be kept in SKYC, Kitakyushu Museum of Natural History and Human History, Japan.

Measurements and indices

- TL Total body length roughly measured from tip of head to tip of gaster.
- HW Maximum head width in full-face view excluding eyes. In male, head width with eyes (Hwe) is also measured.
- HL Head length in full-face view from anterior margin of clypeus to mid-point of line across posterior margin of head
- EW Maximum width of eye (queen).
- EL Maximum length of eye (queen).
- SL Scape length excluding basal constriction and condylar bulb.
- PrW Maximum pronotal width in dorsal view.
- PtW Maximum petiolar width in dorsal view.
- PtL Maximum petiolar length in dorsal view.

- PtH Maximum subpetiolar height in profile view excluding subpetiolar process (measured for posterior half of petiole).
- PptW Maximum postpetiolar width in dorsal view.
- PptL Maximum postpetiolar length in dorsal view.
- PptH Maximum postpetiolar height in profile view.
- G1W Maximum width of gastral tergite I (abdominal tergite IV) in dorsal view.
- G1L Length of gastral tergite I in dorsal view, measured from mid-point of line across anterior margin of posttergite, i.e., excluding cinctus and pretergite, to posterior margin of the posttergite.
- FWL Forewing length (queen, male).
- HWL Hindwing length (queen, male).
- CI Head width divided by head length x 100.
- SI Scape length divided by head width x 100.
- G1I Width of gastral tergite 1 (G1W) divided by its length (G1L) x 100 (see definition for G1L above).

TAXONOMY

Identification at genus level was made with the key to the world genera of Dorylinae by Borowiec (2016). Some taxonomically important characters are explained below.

Parafrontal ridge. Rather thick ridge running close to the outer margin of the antennal socket. Among the Asian doryline groups, it is seen in most of the former *Cerapachys* and some species groups of *Aenictus*. The ridge sometimes merges with the anterior portion of the antennal socket wall (torulus), and varies in development and shape, occasionally with a denticle or prominence in the anterior portion before merging with the torulus.

Posterior flange of temple. With the head in profile view, the occipital carina often forms a flange of varying size (width) on the temple (upper gena). The shape and development of the flange is often useful in species recognition.

Metapleural gland orifice. The orifice is positioned in the extreme lower corner of the metapleuron, and generally partly masked by ornaments (flap or lip) and sometimes bears peripheral hairs. It can be observed in ventrolateral view. (see Bolton 1990b)

Presclerites of abdominal segment IV. These sclerites are generally hidden under the preceding segment (III, postpetiole). However, in stretched specimens these parts can be observed and sometimes provide useful characters. Generally, the pretergite and presternite have the same type of sculpture.

Cinctus. Pretergite and presternite of the abdominal segment IV (gastral segment I) are completely fused together forming a ring. ‘Narrow’ zone located at the base of the ring is called cinctus (girdling constriction sensu Bolton 1994). It is often well defined and cross-ribbed on the tergite, forming a chain of punctures, but occasionally ill-defined or obsolete. It can be seen on both the tergite and sternite, but generally much reduced to a mere line or almost lost on the latter.

Genus *Ooceraea* Roger, 1862

Diagnosis (worker). With characteristics shared by doryline genera (see Bolton 1990a, b). Parafrontal ridge always present. Eye reduced, or more frequently absent. Antenna with 6, 7, 8

or 9 flagellomeres (8–11 antennomeres). Anterior slope of pronotum often delimited from pronotal dorsum with distinct transverse carina. Pronotomesopleural suture present as deep cut. Tarsal claws simple. Hind-basitarsus not widening distally. Abdominal segment IV occupying most part of gastral dorsum. Constriction absent anteriorly on abdominal segments V and VI (gastral segments II and III). In profile view abdominal tergite IV anteriorly only slightly covering sternite IV (base of sternite generally exposed). Pygidium armed with spine-like setae. (Borowiec 2016; Zhou et al. 2020; present study).

Ooceraea magna Yamane et Mizuno, sp. nov.

<http://zoobank.org/4942965D-BAE0-42E0-A7E5-A0ECD8E7E0F5>

(Fig. 1A–E)

Type material. Holotype: worker, Malaysia, Borneo, Sabah, Crocker Range, Inobong, 23.ii.2006, Sk. Yamane leg. (24SKYRM-01; ITBC). Paratype: 1 worker, same data as above (24SKYRM-02; SKYC).

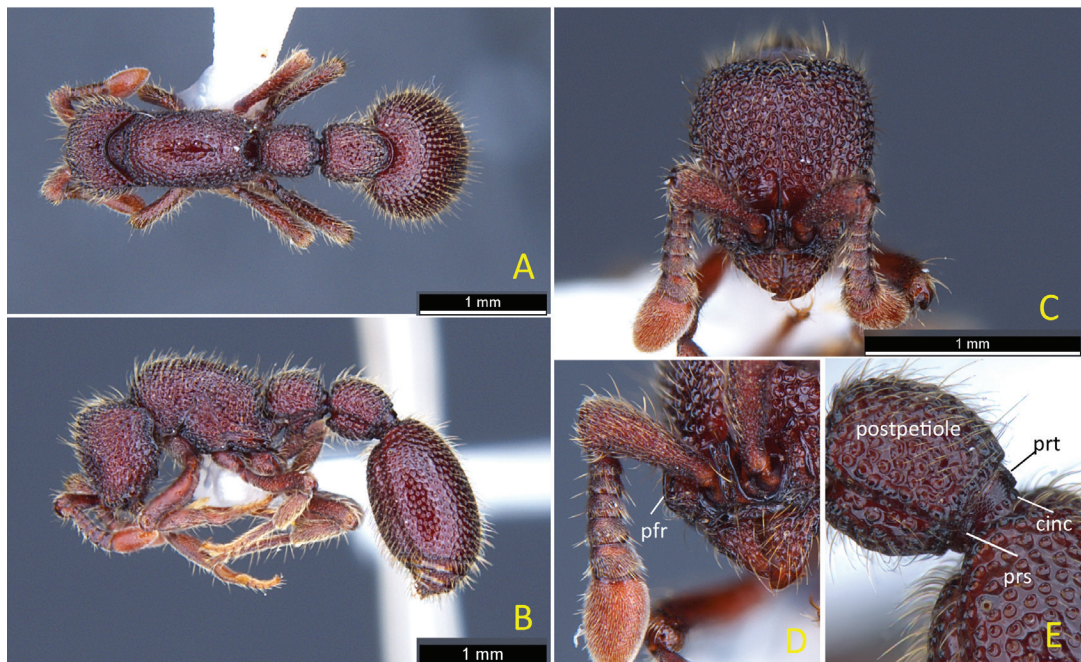


Fig. 1. *Ooceraea magna* sp. nov., holotype worker: A) habitus in dorsal view B) habitus in profile view C) head in full-face view D) head in oblique-frontal view. E) cinctus and presclerites of abdominal segment IV (gastral segment I). pfr, parafrontal ridge; cinc, cinctus; prs, presternite; prt, pretergite.

Worker description. *Diagnosis.* Large species with total body length 3.7–3.9 mm and head width 0.78–0.82 mm. Entire body dark reddish brown and coarsely punctate or punctoreticulate. Antenna with 7 flagellomeres (9 antennomeres). Anterior margin of clypeus straight. Lateral margin of propodeal declivity with three denticles, the uppermost (can be called propodeal spine) being largest.

Measurements (n=2): TL 3.7–3.9, HW 0.78–0.82, HL 0.83–0.87, SL 0.52–0.55, PrW 0.58–0.63, PtW 0.42–0.43, PtL 0.45–0.47, PtH 0.38–0.40, PptW 0.44–0.48, PptL 0.48–0.50, PptH 0.45–0.49, G1W 0.98–1.03, G1L 1.28–1.33; CI 94.0–94.3, SI 66.7–67.1, GII 77.0.

Full description. Head in full-face view slightly longer than broad, with shallowly convex lateral margin, almost straight posterior margin and round posterolateral corner (Fig. 1C). Parafrontal ridge rather sharply carinate (Fig. 1D, pfr). With head in profile view, posteroventral flange on temple moderately developed, medially broadly emarginate. Eye absent. Antenna with 7 flagellomeres (9 antennomeres); pedicel and flagellomere I very short and even difficult to separate. Mesosoma in dorsal view (Fig. 1A) narrower than head, without any transverse sutures demarcating segments; anterior slope of pronotum delimited from dorsum with transverse carina; metanotal groove absent. With mesosoma in profile view (Fig. 1B), pronoto-mesopleural suture sharply defined; mesopleuron, metapleuron and lateral face of propodeum nearly completely fused; propodeal spine short but distinct; propodeal lobe low. With propodeum in posterior view, declivity laterally with incomplete carina leaving two separate denticles; transverse carina between propodeal spines reduced. With waist in dorsal view, petiole slightly longer than broad, anteriorly shallowly convex, posteriorly and laterally straight; postpetiole slightly broader than petiole, slightly longer than broad, with anterior and posterior margins straight, and lateral margin very shallowly convex. With waist in lateral view, tergal portion of both petiole and postpetiole distinctly longer than high; petiole with roundly convex dorsal outline and almost straight anterior and posterior margins; subpetiolar process large, located at midlength of ventral margin of sternite,

anteriorly with downward-directed small process, posteriorly with backward-directed process; postpetiole with roundly convex dorsal outline; its sternite clearly demarcated from node with sharp sulcus, anteriorly deeply concave, ventrally evenly convex. Gaster in dorsal view more than 2 times as broad as postpetiole, occupying most part of gastral dorsum, distinctly narrowed anteriorly, with almost straight lateral margin in posterior two-thirds; presclerites of gastral segment I narrow, 0.63 times as broad as postpetiole, dorsally with relatively long cinctus (as relatively ‘broad’ zone in front of posttergite) (Fig. 1E, cinc).

Almost entire body coarsely punctate (partly punctoreticulate). Antennal scape and femora of all legs with finer punctation; antennal pedicel and flagellum and tibiae of all legs with still finer punctation. Cinctus of gastral tergite I basally (posteriorly) smooth; its anterior zone with chain of punctures; pretergite in front of cinctus with fine sculpture showing rectangular-shaped mesh pattern.

Body hairy, with erect/suberect hairs of various lengths over dorsal surface of head, mesosoma, waist and gaster; venter of postpetiole and gastral sternite with similar hairs; antennal scape, tibiae and tarsi with long erect hairs; antennal flagellum with shorter hairs along anterior margin of each flagellomere; long hairs on femora suberect to decumbent; pubescence lacking in most part of body; tibiae and tarsi of all legs covered with appressed hairs. Body entirely dark reddish brown; apical flagellomere yellowish.

Remarks. This is probably the largest species among the Sundaland congeners, measuring 3.7–3.9 mm in total body length and 0.78–0.82 mm in head width, but slightly smaller than the Vietnamese species *O. uadridentate* Yamada et al. 2018. These two species are similar to each other in body size and general appearance, but differ in the number of antennomeres (9 in the new species vs. 11 in *O. uadridentate*). *Ooceraea magna* sp. nov. is easily separated from the other Asian congeners by 1) large body size, 2) peculiar shape of the subpetiolar process, and 3) the postpetiole longer than broad. Yamane et al. (2021) recorded three species of *Ooceraea* from Lambir Hills National Park, Sarawak, but all had not been identified. The present new species agrees well with *Ooceraea* sp. 2 of SKY from Lambir.

Etymology. The specific epithet, *magna*, is named after the large and sturdy body.

Genus *Syscia* Roger 1861

Diagnosis (worker). With characteristics shared by doryline genera (see Bolton, 1990a, b). Parafrontal ridge more or less developed. Eye reduced, or more frequently absent. Antenna with 7 or 9 flagellomeres (9 or 11 antennomeres). Pronotum generally not clearly divided into anterior slope and dorsum by transverse carina. Pronoto-mesopleural suture present as deep cut. Tarsal claws simple. Hind-basitarsus smoothly widening distally. Constriction absent anteriorly on abdominal segments V and VI (gastral segments II and III). In profile view abdominal tergite IV anteriorly folding over sternite to varying extent. Pygidium armed with spine-like setae (Borowiec 2016; present study).

Syscia sabahna Yamane et Mizuno, sp. nov.

<http://zoobank.org/C5D128A4-5A0D-4634-9D59-BFF88E1AAE4D>

Fig. 2A–D, Fig. 3A–C

Type material. Holotype: worker, Malaysia, Borneo, Sabah, Crocker Range, Inobong, 23.ii.2006, Sk. Yamane leg., SB06-SKY-06 (24SKYRM-03; ITBC). Paratypes: 5 workers & 1 dealate queen, same data as above (24SKYRM-04–09; ITBC, SKYC).

Nontype material examined. 3 workers, Sabah, Kinabalu Park, Poring, 600–700 m alt., 8.i.1998, Sk. Yamane leg. (ITBC, SKYC); 5 workers, Sabah, Kinabalu Park, Tambuyukon, 29.iii.2013, Sk. Yamane, SB13-SKY-14 (ITBC, SKYC); 1 worker, Sabah, Tawau Hills National Park, 8.vii.1996, Sk. Yamane leg. (SKYC).

Worker description. *Diagnosis.* Body reddish brown with yellowish apical flagellomere of antenna and legs, extensively punctate/punctoreticulate. Antenna with 9 flagellomeres (11 antennomeres). Head in profile view with posterior portion of its ventral margin provided with lamellate flange. Propodeal declivity superficially sculptured and rather shiny, with transverse dorsal carina more or less complete. Petiole slightly longer than broad, postpetiole as broad as long.

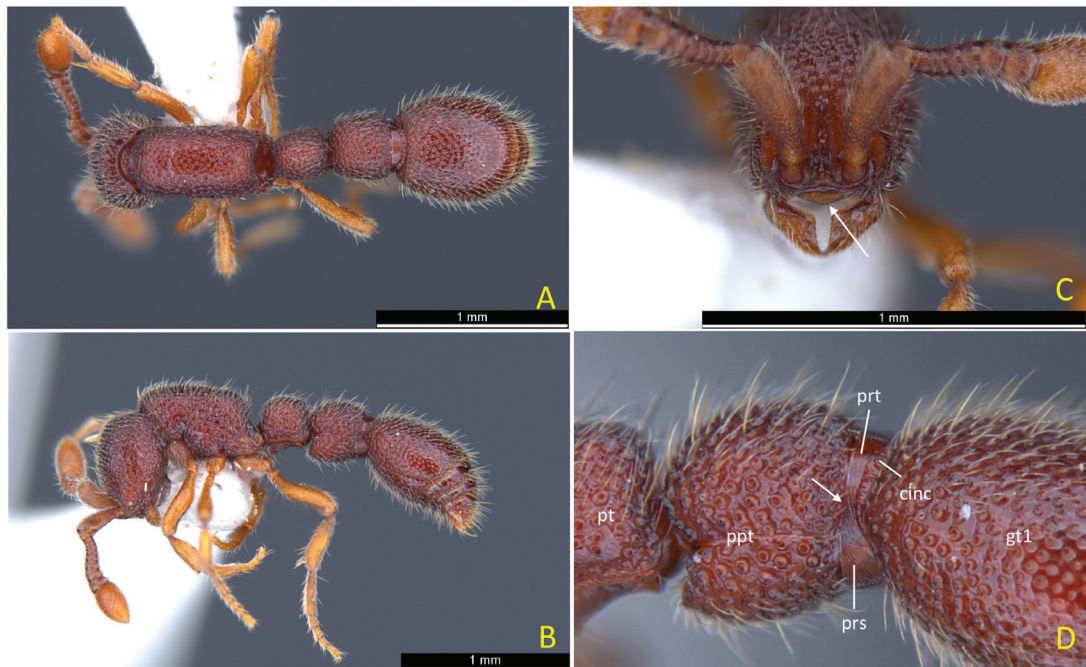


Fig. 2. *Syscia sabahna* sp. nov., paratype worker: A) habitus in dorsal view B) habitus in profile view C) head in full-face view (arrow: anterior margin of clypeus) D) cinctus and presclerites of gastral segment I (abdominal segment IV) (arrow: narrowed part of presclerite ring). cinc, cinctus; gt1, gastral tergite I (posttergite); ppt, postpetiole; prs, presternite; prt, pretergite; pt, petiole.

Measurements (n=5). TL 2.3–2.5, HW 0.47–0.49, HL 0.61–0.63, SL 0.30–0.33, PrW 0.35–0.37, PtW 0.24–0.26, PtL 0.26–0.28, PtH 0.25–0.29, PptW 0.32–0.34, PptL 0.33, PptH 0.34–0.36, G1W 0.52–0.53, 0.58–0.61. CI 75.8–80.3, SI 62.5–68.1, G1I 86.7–89.8.

Full description. Head in full-face view distinctly longer than broad, narrowed anteriorly, with weakly convex lateral margin, very shallowly concave posterior margin and rounded posterolateral corner (Fig. 2C). Frontal carinae raised high, posteriorly very close to each other, slightly diverging anteriorly; parafrenal ridge moderately developed, without anterior prominence. Clypeus lamellate, very short, with anterior and posterior margins convex (Fig. 2C, arrow). Mandible subtriangular, in profile view down-curved; masticatory margin minutely serrate; basal margin entire. Antenna with 9 flagellomeres (11 antennomeres); scape when laid back slightly broadened apically, weakly outwardly curved; pedicel small, broader than long; flagellomeres I–IV ring-like, each shorter than pedicel; club composed of 4- or 5 flagellomeres but poorly differentiated from preceding ones; apical flagellomere thick and long, much longer than four preceding flagellomeres combined, as long as scape. With head in profile view, posterolateral corner round; lamellate flange present along posteroventral margin of temple/gena. Mesosoma in dorsal view (Fig. 2A) with straight anterior margin, parallel lateral margins and concave posterior margin that is carinate, completely lacking pro-mesonotal suture and metanotal groove. With mesosoma in profile view (Fig. 2B), dorsal outline shallowly convex, highest at mid-length; pronotum with anteroventral corner bluntly angled; its ventral margin with lamellate flange; pronoto-mesopleural suture deep; mesopleuron, metapleuron and lateral face of propodeum completely fused; metapleuron gland orifice with elongate opening, partly masked with dorsal and ventral flaps, dorsally with several peripheral hairs; propodeum with posterior margin steep, without posterodorsal spine; propodeal lobe roundly produced backward. Propodeum in posterior view with declivity

marginated with continuous carina dorsally and laterally. Foretrochanter much larger than mid- and hindtrochanters, which are basally petiolate. With waist in dorsal view, petiole only slightly longer than broad, with straight lateral margin, slightly diverging posteriorly; postpetiole broader than petiole, almost as long as broad, broadened posteriorly. Petiole in profile view nearly as long as high, with node clearly separated from sternite; dorsal outline shallowly convex; subpetiolar process with beak-like anterior prominence that is downwardly directed, but shape of the process highly variable; postpetiole as long as high with convex dorsal and ventral margins; its anteroventral margin rather sharply carinate (Fig. 2D). Gastral tergite I much broader than postpetiole, longer than broad (G1I 86.7–89.7), longer than other tergites combined, broader posteriorly than anteriorly; cinctus well differentiated and cross-ribbed on tergite but obsolete on sternite (Fig. 2D, cinc); presclerite transversely striate, slightly 'narrowed' around border of tergite and sternite (Fig. 2D); last sternite laterally marginated with carinae.

Body almost entirely covered with dense punctation or puncto-reticulation. Clypeus finely sculptured and weakly shiny; area mesad to parafrenal ridge smooth and shiny. Mandible with punctures but rather shiny. Antennal scape with dense medium-sized punctures. Entire apical flagellomere and basal portions of flagellomeres VII–IX punctate and matte. Posterior face of propodeal declivity superficially sculptured and shiny. All coxae minutely punctate; all tarsi microsculptured and matte; forefemur and foretibia superficially punctate and shiny, other femora and tibiae more coarsely punctate and matte.

Dorsum of body almost entirely covered with erect/suberect/decumbent short hairs, mixed with sparser long hairs; venter of postpetiole and gaster with similar pilosity; venter of petiole with a few erect hairs anteriorly. Antennae covered with dense short erect/suberect hairs mixed with sparser, slightly longer erect hairs; apical flagellomere almost without long hairs. Legs with dense, short decumbent hairs; longer erect/suberect hairs much sparser. Body entirely yellowish to reddish brown; mandible, apical flagellomere and legs much paler.

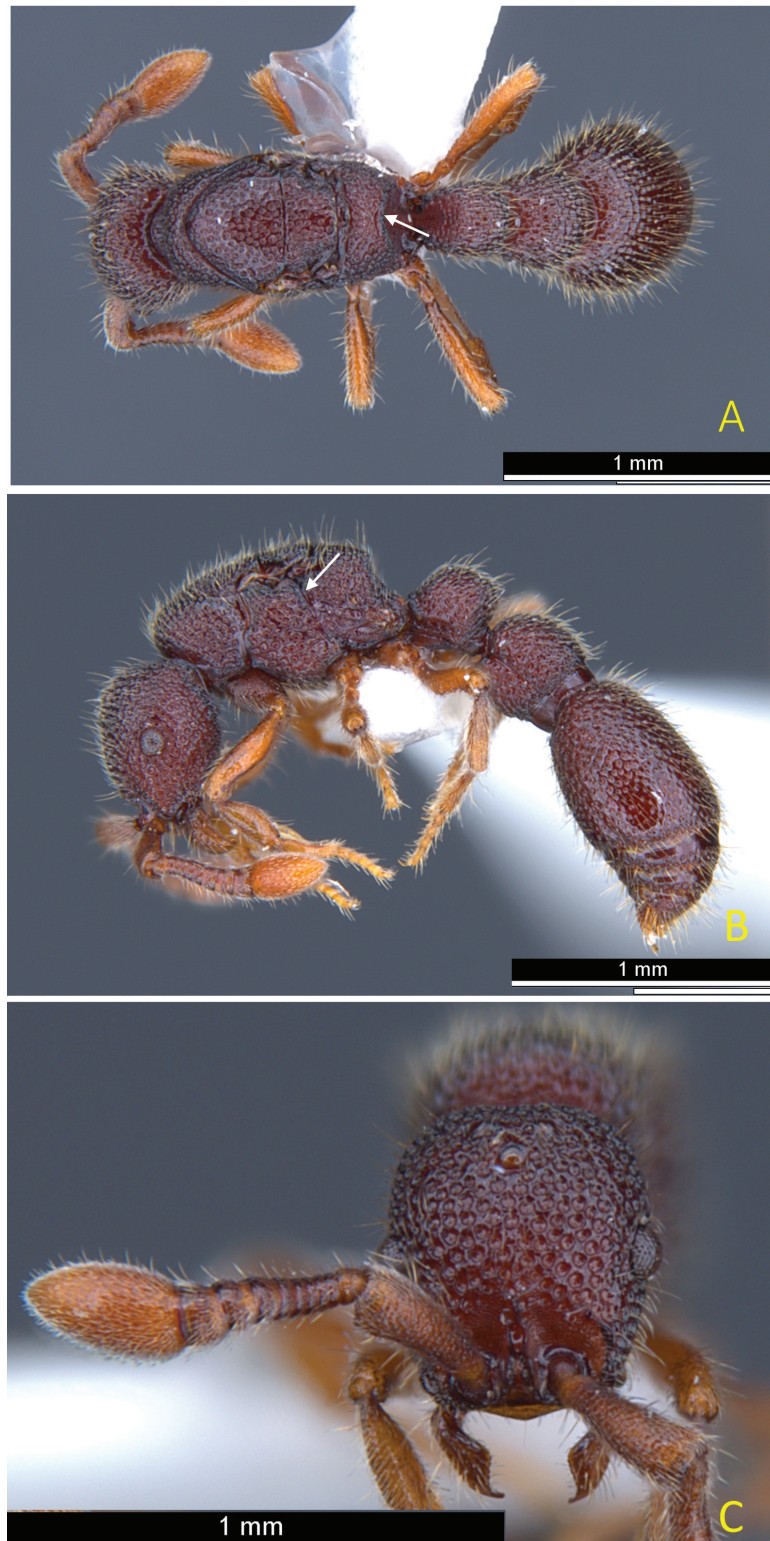


Fig. 3. *Syscia sabahna* sp. nov., paratype dealate queen: A) habitus in dorsal view (arrow: metanotum) B) habitus in profile view (arrow: groove separating mesopleuron and metapleuron) C) head in full-face view.

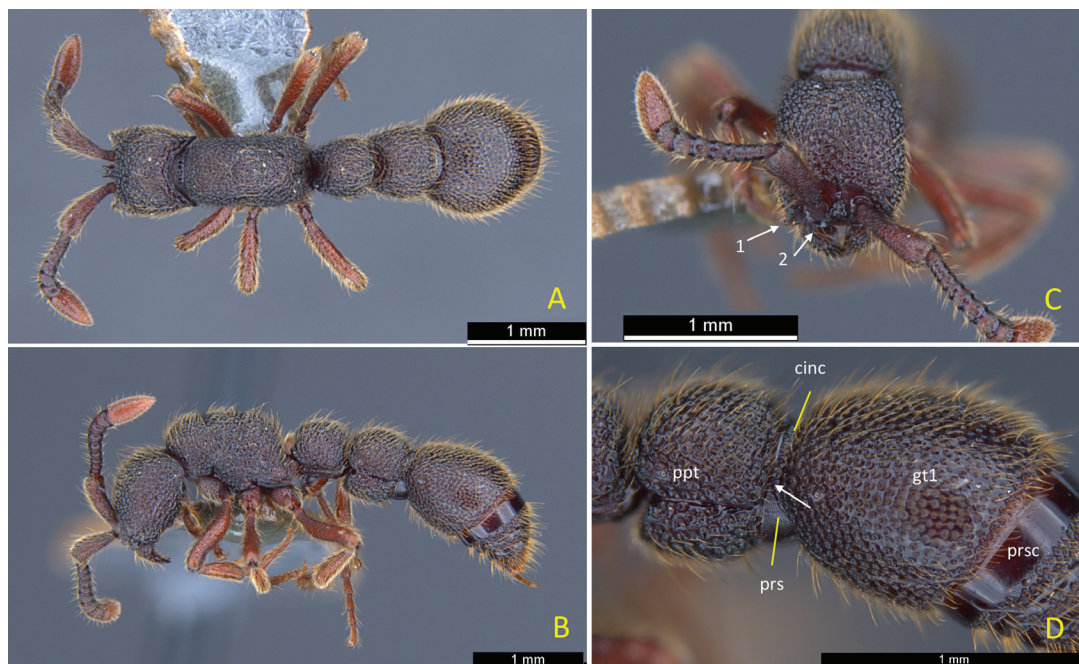


Fig. 4. *Syscia yekzoeae* sp. nov., paratype worker: A) habitus in dorsal view B) habitus in profile view C) head in full-face view (arrow 1: anterior process of parafrontal ridge; arrow 2: process located in front of antennal socket) D) cinctus and presclerites of gastral segment I (abdominal segment IV) (arrow: narrowed part of presclerite ring). cinc, cinctus; gt1, gastral tergite I (posttergite); ppt, postpetiole; prs, presternite; prsc, presclerite ring of gastral segment II.



Fig. 5. *Syscia yekzoeae* sp. nov., paratype queen: A) habitus in dorsal view B) habitus in profile view C) head in full-face view D) mesosoma in dorsal view. dc, propodeal declivity; mssl, mesoscutellum; msst, mesoscutum; mtn, metanotum; prn, pronotum; prp, propodeum.

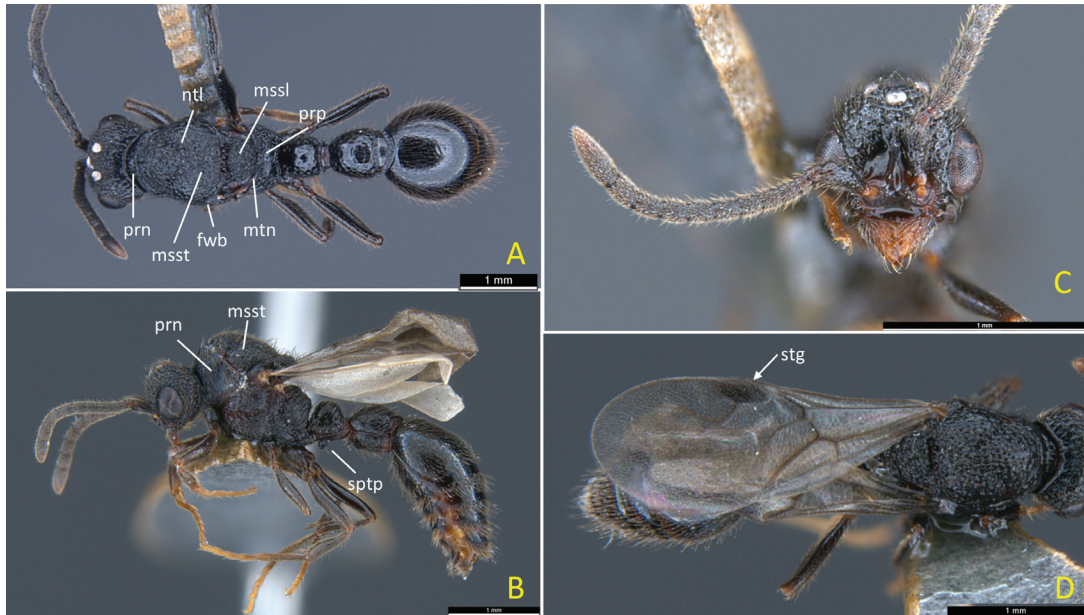


Fig. 6. *Syscia yekzoeae* sp. nov., paratype male: A) habitus in dorsal view (wings removed to show sclerites) B) habitus in profile view C) head in full-face view D) forewing. fwb, forewing base; msst, mesoscutum; mtan, metanotum; prn, pronotum; prp, propodeum; sptp, subpetiolar process; stg, pterostigma.

Queen description. *Measurements* (n=1): TL 3.0 mm, HW 0.51, HL 0.61, SL 0.34, EW 0.09, EL 0.10, PrW 0.49, PtW 0.29, PtL 0.28, PtH 0.41, PptW 0.37, PptL 0.35, PptH 0.27, G1W 0.62; G1L 0.94; CI 85.0, SI 66.7, GII 66.0.

Description. Very similar to worker in size, structure, sculpture, pilosity and coloration except for caste-specific characters mainly seen in head and mesosoma (Fig. 3). Body size almost same as that of worker (but see measurements). Parafrenal ridge with incision at mid-length (throughout entire in worker). Eye hemispherical, located on lateral face of head at midlength of cranium, with ca. 15 ommatidia along longest axis and a few suberect hairs; with head in full-face view outer margin of eye distinctly projecting from lateral margin of head. Complete set of ocelli present that are arranged in flat triangle; all ocelli with same size. With mesosoma in dorsal view, mesoscutum longer than pronotum, anteriorly strongly narrowed, with round apex; scutocutellar suture straight; main disc of mesoscutellum much shorter than mesoscutum, broader than long, distinctly narrowed posteriad; metanotum very short ('narrow'), sharply defined anteriorly and posteriorly by microgrooves; propodeum slightly narrower than mesonotum,

as long as mesoscutellum, posteriorly margined with carina (Fig. 3A, arrow). With mesosoma in profile view, dorsal outline shallowly convex; pronotum with steep anterior margin and short dorsal margin; pronoto-mesopleural sulcus complete; mesopleuron not divided into upper and lower sections; separation of mesopleuron from metapleuron clear only in upper one-third (Fig. 3B, arrow); metapleuron and lateral face of propodeum completely fused.

Remarks. This species is differentiated from related Asian species with 11 antennomeres by the following combination of character conditions: 1) posterolateral lamellate zone (flange) of head rather developed, 2) anterior clypeal margin distinctly convex, 3) posterodorsal carina on propodeal declivity complete or only partly interrupted medially, 4) cinctus of gastral segment I clearly defined, cross ribbed, 5) punctation on head dorsum, gastral tergites III and IV very coarse (with ca. 20 large punctures on a line across head dorsum in full-face view) 6) in profile view dorsa of petiole, postpetiole and gastral tergite I roundly convex, 7) subpetiolar process ill-developed, not distinctly produced ventrad.

This species inhabits good forests. The colony SB06-SKY-06 (type series) was collected from rotting wood, and SB13-SKY-14 from leaf litter. *Syscia* sp. 9 of SKY collected from Lambir National Park, Sarawak, Borneo (Yamane et al 2021) well agrees with the present new species.

Etymology. The specific epithet derives from the type locality (Sabah).

***Syscia yekzoeae* Yamane et Mizuno, sp. nov.**

<http://zoobank.org/86921D8F-D0C4-4B4B-9FA7-DD76AE4896DF>

Fig. 4A–D, 5A–D, 6A–D

Type material. Holotype: worker, East Malaysia (Borneo), Sabah, Papar, Hutan Lipur, Kawang FR, 15.xi.2023, Sk. Yamane leg., SB23-SKY-04 (24SKYRM10; ITBC). Paratypes: 1 queen, 2 workers & 2 males, same locality & date, Sk. Yamane / R. Mizuno leg., SB23-SKY-04 & RM772 (24SKYRM-11–15).

Worker description. *Diagnosis:* Body dark reddish brown (with naked eyes looking almost black), large (3.6–4.1 mm in total length; 0.75–0.80 in head width), entirely covered with dense, coarse punctation. Parafrontal ridge with conspicuous process in anterior portion. Antenna with 9 flagellomeres (11 antennomeres). Propodeal declivity dorsolaterally with pair of short carinae. Petiole as broad as or slightly broader than long; postpetiole broader than long.

Measurements (n=3): TL 3.6–4.1, HW 0.75–0.80, HL 0.90–0.93, SL 0.60–0.63, PrW 0.57–0.62, PtW 0.49–0.52, PtL 0.47–0.52, PtH 0.47–0.49, PptW 0.61–0.68, PptL 0.57–0.62, PptH 0.45–0.46, GIW 0.93–1.03, G1L 0.94–1.01. CI 83.3–86.0, SI 77.9–80.0, G1I 99.0–104.

Full description. Head in full-face view longer than broad, with very shallowly convex lateral margin, broadly emarginate posterior margin, and roundly angled posterolateral corner (Fig. 4C). Frontal carinae raised high, very close to each other, diverging anteriorly; parafrontal ridge thick and well developed, with distinct process in anterior portion (Fig. 4C, arrow 1); anteriorly-

directed small process present in front of each antennal socket (arrow 2). Clypeus short, much broader than long, with concave disc, and broadly and weakly convex anterior and posterior margins. Eye absent. Mandible in dorsal view subtriangular; its masticatory margin evenly and shallowly concave, edentate; basal triangular area distinctly lower than main part of mandible; apex not sharply pointed. Antenna with 9 flagellomeres (11 antennomeres); scape when laid back slightly surpassing mid-length of head, broadened apicad, outwardly curved in apical one third; venter of scape deeply excavated in apical two-fifths; the excavation flanked by high lateral carinae; pedicel small, as long as broad; flagellomeres 1–VI (antennomeres III–VIII) bead-like, each broader than long; apical flagellomere very large, much longer than two preceding ones combined; club indistinct. Mesosoma in dorsal view narrower but longer than head; pro-mesonotal suture faint; metanotal groove completely absent; posterodorsal margin of propodeum with pair of short carinae that look like propodeal spines. Mesosoma in profile view with shallowly convex dorsal outline; pronotum separated from mesopleuron with deep suture, with anteroventral corner angulate; mesopleuron demarcated from metapleuron with faint line; metapleuron fused with lateral face of propodeum; metapleural gland orifice with oblong opening and ventral wall, without peripheral hairs; propodeal spiracle very small, smaller than nearby punctures, located low on lateral face far from posterior margin of declivity; propodeal lobe round. Propodeum in posterior view with pair of upper lateral carinae that are rather high; faint carina present (can be obsolete) between them; declivity with blunt longitudinal median keel in its lower part. All femora longer than tibiae; fore-basitarsus in profile view broader basally than apically; hind basitarsus in profile view broadened apicad. Petiole slightly broader than long, with anterior and posterior margin straight and lateral margin shallowly convex; postpetiole broader than long, broadened posteriad, with almost straight anterior and posterior margins. With waist in profile view, petiolar node (tergite) longer than high; sternite distinctly demarcated from node; subpetiolar process subtriangular with anterior slope longer than posterior slope; postpetiole

higher than long with convex dorsal and ventral outlines; its anteroventral margin round; sternite clearly separated from tergite by deep suture (Fig. 4D). With gaster in dorsal view, tergite I nearly as long as broad, with broadly concave anterior margin and almost straight posterior margin; lateral margin roundly convex; presclerite distinctly constricted around border of tergite and sternite (Fig. 4C, arrow); cinctus dorsally cross-ribbed, forming chain of elongate punctures (Fig. 4D, cinc), but ventrally reduced; other gastral tergites combined shorter than tergite I.

Almost entire body except for appendages densely covered with coarse punctures, with interspaces smooth and shiny. Area between frontal carinae and posterior half of clypeus smooth and shiny; anterior half of clypeus minutely sculptured and matte. Mandible strongly punctate with apical area, narrow area along masticatory margin and basal triangular corner smooth and shiny. Antennal scape with dense small punctures; pedicel with dense minute punctures and matte; flagellomeres I–VIII basally minutely punctate and mat, apically smooth and shiny; punctate area more extensive in flagellomeres VI–VIII; apical flagellomere entirely covered with superficial ill-defined punctuation and rather shiny. Coxae, femora and tibiae of all legs anteriorly with ill-defined irregular punctuation; tarsi with finer punctuation. Pretergite and presternite of gastral segment I with fine transverse striation.

Entire body dorsally with suberect/decumbent hairs of varying length. Lateral margin of head in full-face view with short decumbent hairs. Dorsal and lateral faces of mandible with erect/suberect hairs of varying length. Antennal scape covered with dense pubescence and with a few long suberect hairs; pedicel and flagellomeres I–VI with short erect/suberect hairs; apical three flagellomeres covered with much shorter erect hairs and sparsely with fewer slightly longer hairs. Metapleural gland orifice with a few peripheral hairs partly covering the orifice. All legs covered with near-appressed short hairs and longer suberect/decumbent hairs of varying length. Subpetiolar process ventrally with several erect hairs; sternite of postpetiole ventrally with sparse suberect hairs; anteroventral margin of the sternite with dense short hairs. Gastral sternites with pilosity slightly sparser than on tergites.

Body entirely dark reddish brown (with naked eyes almost black). Scape and apical flagellomere, and all legs much paler than body proper.

Queen description. *Measurements* (n=1). HW 0.77, HL 0.92, SL 0.61, EW 0.10, EL 0.13, PrW 0.70, PtW 0.54, PtL 0.48, PtH 0.51, PptW 0.69, PptL 0.58, PptH 0.48, G1W 1.12, G1L 1.06, FwL 0.52, HwL 0.40. CI 83.7, SI 79.2, G1I 106.0.

Description. Similar to worker in size, structure and sculpture except for caste-specific characters mainly seen in head and mesosoma (Fig. 5A, B). Eye located at midlength of cranium, hemispherical, distinctly raised above surrounding cranial surface, with ca. 10 ommatidia that are ill defined; ocelli arranged in flat triangle; anterior ocellus larger than posterior ocellus. With mesosoma in dorsal view (Fig. 5A), mesoscutum as long as pronotum, longer than mesoscutellum, anteriorly roundly convex, demarcated from pronotum by distinct suture; scuto-scutellar suture straight; metanotum short ('narrow'), poorly defined; propodeum as long as mesoscutellum, deeply emarginate posteriorly. With mesosoma in profile view (Fig. 5B), pronoto-mesopleural suture complete; mesopleuron not divided into upper and lower sections, poorly demarcated from metapleuron; metapleuron and lateral face of propodeum completely fused. Wings present, but vestigial (Fig. 5D); forewing with three longitudinal vein-like thickenings that are blackish, without closed cell. Body entirely orangish brown, with apical flagellomere of antenna and legs more yellowish.

Male description. *Measurements* (n=2). HW 0.72–0.73 (HWe 0.84–0.90), HL 0.72–0.77, SL 0.33, PrW 0.78–0.82, PtW 0.38–0.39, PtL 0.33–0.35, PtH 0.37–0.42, PptW 0.46–0.48, PptL 0.44–0.47, PptH 0.50–0.53, G1W 0.88–0.93, G1L 0.84–0.86, FwL 2.70–2.80, HwL 1.14–1.17. CI 95.0–100.0, SI 45.2–45.8, G1I 105.8–108.1.

Description. Head in full-face view as long as broad, but broader than long when including eyes (CIe: 116.7–116.9); posterior margin broadly convex with median emargination (Fig. 6C). Frontal carinae short, convergent posteriad; parafrontal ridge essentially absent; antennal scrobe small with

its posterior margin located at level of posterior end of frontal carina. Clypeus clearly separated from frons by transverse ridge, with almost vertical posterior portion; anterior clypeal margin convex. Mandible subtriangular, with sharply pointed apex; masticatory margin serrate or provided with minute denticles; basal margin straight and entire. Antenna with 10 flagellomeres (12 antennomeres); scape shorter than eye width, distally widened; pedicel small, as long as flagellomere I; flagellomeres each longer than broad, getting longer towards apical flagellomere; apical flagellomere 2.4 times as long as broad. Eye large, distinctly breaking lateral margin of head; inner eye margins diverging posteriad; ocelli complete, arranged in flat triangle; distance between anterior and posterior ocelli less than diameter of ocellus; distance between posterior ocellus and eye 1.6 times as long as that between posterior ocelli. With head in profile view, occipital carina not reaching mandibular base, distinctly visible for 2/3 length of temple+gena, not forming broad flange. Mesosoma in dorsal view (Fig. 6A; wings removed) broadest at forewing bases (Fig. 6A, fwB); pronotum short, with anterolateral corner round; mesoscutum much broader than pronotum, anteriorly broadly convex, with V-shaped notauli (Fig. 6A, ntl) and weak parapsidal line that ends at posterior end of notauli; mesoscutellum separated from mesoscutum with 'broad' and deep furrow; its width nearly same as distance between starting points of parapsidal lines; metanotum short ('narrow' band); propodeum short, margined posteriorly with transverse carina. With mesosoma in profile view (Fig. 6B), pronotum anteriorly steeply sloping; mesonotum distinctly higher than pronotum, metanotum and propodeum; pronotum dorsally very short, with its lateral face extensively concave; mesopleuron separated from pronotum with deep furrow, divided into upper and lower sections with deep furrow; its upper section demarcated from metapleuron, but lower section fused with the latter; lateral face of propodeum demarcated from metapleuron with vague furrow; propodeum without posterior spine; declivity steep, margined laterally and dorsally with continuous carina. Petiole in dorsal view broader than long, with lateral margin weakly convex; postpetiole broader than petiole, as long as broad, distinctly narrowed anteriorly. With

waist in profile view, petiole globular, with node as long as high; subpetiolar process triangular (Fig. 6B, sptp); postpetiole with tergal and sternal portions almost of same height; sternum anteriorly distinctly carinate. Gastral tergite I in dorsal view slightly broader than long, laterally convex; cinctus throughout cross-ribbed; presclerites transversely striate. Wings fully developed; forewing with large pterostigma and reduced venation (Fig. 6C).

Head and mesosoma extensively and densely punctate or punctoreticulate; punctation on waist much sparser; gastral tergite I and sternite I essentially smooth; subsequent tergites and sternites densely with medium-sized punctures. Antenna with dense punctures and matte; coxae, femora and tibiae of all legs with irregular sculpture and weakly shiny; tarsi densely micropunctate and matte.

Dorsa of head, mesosoma, waist and gaster with decumbent to erect hairs of varying length. Venter of petiole lacking erect hairs, while that of postpetiole with erect hairs. Antennal scape with a few long erect hairs; pedicel and flagellum with much shorter hairs that are very dense. All legs with fine decumbent/appressed hairs and much longer suberect/erect hairs. Body entirely blackish, with mandible and tarsi of all legs brownish.

Remarks. In the worker caste *Syscia yekzoeae* sp. nov. is the largest among the Sundaland congeners, and comparable to the New World *S. grandis* Longino et Branstetter, 2021 among the named species. *Syscia yekzoeae* sp. nov. is very similar in coloration, structure and sculpture to *S. reticularis* Jaitrong et al. 2020 except in body size (3.7–4.1 mm in the new species vs. 2.4–3.0 mm in the latter in total body length; 0.75–0.80 mm vs. 0.46–0.50 mm in head width). However, it is also distinguished from *S. reticularis* in the following details: 1) head relatively broader, with lateral margin nearly straight (head distinctly longer than broad, with lateral margin convex in the latter), 2) parafrontal ridge with anterior process isolated from its main part (isolated process absent in the latter); 3) flagellomeres I–III (antennomeres III–V) bead-like, each longer than half length of pedicel (very short, not bead-like, and each much shorter than half length of pedicel in the latter); 4) propodeal declivity with pair of dorsolateral short

carinae (carinae absent or obsolete in the latter); 5) gastral tergite I almost as long as broad with width/length ratio (G1I) 0.92–1.01 (much longer than broad, with G1I 0.80–0.83 in the latter).

Biological note. The queen is brachypterous, with seemingly non-functional wings. Brachypterous queens are also known in some New World species such as *S. amblyogyne* Longino et Branstetter, 2021, *S. augustae* (Wheeler 1902), etc. Among the Old World species, one of the Thai species, *S. chalahthanyakiji* Jaitrong et al., 2020, may be fully winged (a dealate queen is known: Jaitrong et al., 2020), while the Japanese species *S. humicola* Ogata, 1983 has ergatoid queens that are variable in eye size and the number of ocelli (none or one) (Ogata 1983). The two queens of the present new species examined are orangish brown in boy color, unlike the worker and male that are dark reddish brown or blackish. This condition might reflect the age of these queens, since teneral adult ants are generally much paler than matured ones. Although their cuticle was fully sclerotized, they can be teneral adults. One dissected queen had eight ovarioles (4 in each ovary) and a worker had two (1 in each). The queen's spermatheca was empty and neither developing oocyte nor yellow body accumulation was found.

The type series represented part of a colony. Six workers, two queens and a male were collected from under rotting wood and in soil; four workers were reared for behavioral observation and obtaining more specimens. During the colony rearing for six months (from collection date to 9 May 2024), they produced 11 males that obviously emerged from unfertilized eggs laid by workers. They went through four entire phasic reproductive cycle as suggested in a congeneric species *S. humicola* (Masuko 2006) and known in some other non-army ant dorylines (e.g., Ravary & Jaisson 2002; Mizuno et al. 2021; Mizuno et al. 2023). Their pupae lacked a cocoon. They fed on provided ant brood (*Tetramorium bicarinatum* larvae, $n = 16$; pupae, $n = 16$). On the other hand, young termites (*Incisitermes minor*, 4 mm body length, $n = 5$) and small mealworms (*Tenebrio molitor*, 4 mm body length, $n = 4$) were killed but never consumed by neither adults nor larvae. Therefore, this species is apparently an obligate ant predator like some other doryline ants for which prey are

known (Idogawa & Dobata 2018; Ito et al. 2018).

Etymology. The specific epithet, *yekzoeae*, is composed of the family name (Yek) and nickname (Zoe) of Dr. Yek Sze Huei of the Institute of Tropical Biology and Conservation, Malaysia Sabah University, to whom we are much indebted for her help in the field work.

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