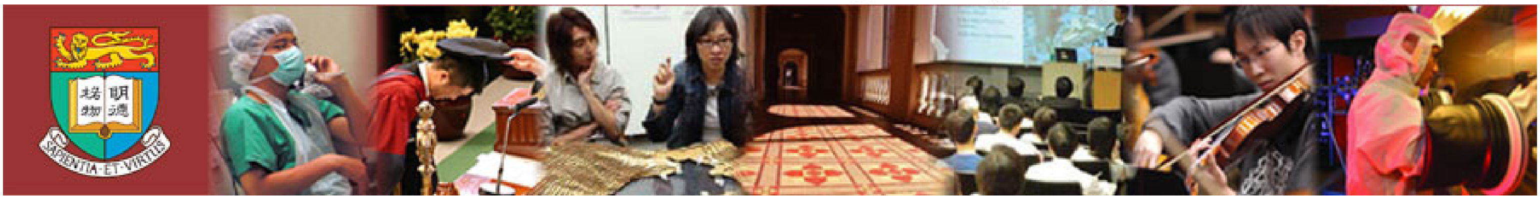

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RESEARCH ARTICLE - ANTS

Toward understanding the predatory ant genus *Myopias* (Formicidae: Ponerinae), including a key to global species, male-based generic diagnosis, and new species description

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Abstract
The predatory ponerine genus *Myopias* has remained poorly known despite considerable interest. To encourage future revisionary and natural history research on the genus, we provide the first global key to valid species; the first male-based diagnosis; a detailed description of a new species, *M. darioi* **sp. nov.**, based on all castes; a review of the natural history; and an update of biogeographic knowledge. The new species is distinguished from all valid *Myopias* species by the comparatively enlarged frontal lobes, subrectangular midclypeal lobe lacking denticles, strongly reduced eyes, and details of mandibular morphology.

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Introduction

Myopias Roger, 1861 is a poorly known ponerine genus distributed in the Oriental, Indo-Australian, and Australasian regions (Bolton, 1994, 1995). The genus comprises forty valid species (Bolton, 2014), including *M. darioi* **new species** described herein. The genus has been treated as distinct since its description, with the exception of a provisional synonymy under *Pachycondyla* Smith, 1858 (Brown, 1973; Snelling, 1981). Willey and Brown (1983) regarded *Myopias* as senior synonym of *Trapeziopelta* Mayr, 1862 and its junior synonym *Bradyponera* Mayr, 1886. The phylogenetic placement of *Myopias* is uncertain, but its placement in the *Odontomachus* genus-group is well-supported (Schmidt 2013; P.S. Ward, pers. comm.).

Few keys exist to species for the genus and no key treats all biogeographic regions. Emery (1900) provided a key to the known species of New Guinea at that time, while Willey and Brown (1983) provided one for Australia, Xu and Liu (2012) provided a key for China, and Xu et al. (2014) provided a key for mainland Asia. Development of knowledge about *Myopias* is hindered by a lack of revisionary work; unfortunately, Bill Brown's revision of the genus was not completed before his death.

In an attempt to build a framework for revisionary and natural history work for *Myopias*, we provide the first global key to valid species, the first male-based diagnosis **of the genus**, a detailed description of all castes of a new species (*M. darioi*), and we review the natural history and update biogeographic knowledge for the genus. The male sex of ants remains one of the great unknowns of the Formicidae (Boudinot, 2015), and as such we provide a male diagnosis of *Myopias* based on characters found to be useful for New World Ponerinae (Boudinot in prep.) and for Ponerinae of the Palearctic, Southeast Asia, Australia, and the Afrotropics (Boudinot unpubl. data). Likewise, we provide a detailed description of all castes of *M. darioi* with the intent of not only capturing diagnostic traits, but also to describe characters which may prove valuable for a global revision of the genus. It is hoped

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the natural history observations described herein will stimulate future research in this field. Finally, we present a summary and update of all published records of the genus, in part to ease identification of newly collected specimens. The natural history and biogeographic reviews provided herein highlight the fragmentary accumulation and lack of knowledge for the genus and for many tropical ant lineages.

Materials and methods

Specimens examined during this study were collected by RSP during the Ant Course 2014 in Borneo. Observations were carried out primarily with two microscopes: A Wild M5 stereomicroscope with a maximum magnification of 50x using 10x oculars, and a Leica MZ95 stereomicroscope with a maximum magnification of 60x using a 1.0x Planapo as main objective and 10x oculars. Stacked photomicrographs were generated using Auto-Montage Pro (Synoptics Ltd., Cambridge, England) and Leica Application Suite V3.7 from source images captured using either a Leica MZ16 A stereomicroscope with a JVC KY-57U camera, or a Leica MC205C. Scanning electron microscope (SEM) micrographs were taken at the Museu de Zoologia da Universidade de São Paulo (MZSP) and the Universidade Federal de São Carlos (UFSCar) - INCT Hympar Sudeste using a LEO 440® and Quanta 250® low vacuum, respectively. All images were edited in Adobe Photoshop® CS5 and all plates were compiled in Adobe Illustrator® CS6. Dissections were carried out in ethanol-filled dishes using fine-tip forceps and with a piece of Bostik Blu-Tack® for stabilizing the specimen. Measurements were recorded to the nearest 0.001 mm and are presented to the nearest tenth 0.01 mm due to error and variation in specimen orientation.

Terminology

Terminology used in this paper follows various resources: setational stature (Wilson, 1955); sculpture (Harris, 1979); wing venation (Yoshimura & Fisher, 2012; Boudinot et al., 2013; Brown & Nutting, 1949); genitalia (Boudinot, 2013); and head and mesosoma (Boudinot & Fisher, 2013) with replacement of "anapleural suture" with *oblique mesopleural sulcus* from Yoshimura and Fisher (2007). We use Ogata's wing venation types (Ogata, 1991) as convenient short-hand for venational patterns in our treatement of the male. Larval terminology follows Wheeler and Wheeler (1976, 1979).

In the key to species four terms used should be specifically explained: *inner mandibular margin* denotes the basalmost margin of the mandible in full-face view, where the mandible meets the head capsule, proximal to the basal mandibular margin which may or may not be distinctly developed in *Myopias*; *basal angle of the mandible* denotes the juncture of the basal and masticatory mandibular margins, whether or not the angle is well-defined; *basal blade of the masticatory mandibular margin* denotes the portion of the masticatory margin from the basal angle to the first distinct tooth, which due to its consistent occurrence in *Myopias* is termed the *prebasal tooth*.

As the meso- and metapleurae of adult Hymenoptera are completely fused to the mesosternum, the terms *mesopectus* and *metapectus* are used for these fusion sclerites. When necessary one may use "ventral mesopectal surface" or "mesothoracic venter" and derivations thereof to describe characteristics of the "mesosternal area" of ants. The definitive pleural area of the metapleuron is here provided with the terms *lower* and *upper metapleural area* to describe the ventral and dorsal metapleural portions of alate ants as these are almost always divided by an external sulcus. *Dorsopropodeum*, *lateropropodeum*, and *posteropropodeum* from Serna and Mackay (2010) are adopted as shorthand for the dorsal, lateral, and posterior propodeal faces (= propodeal declivity), respectively. Orientation of the male head capsule is treated differently than the female castes as the male of *Myopias* is hypognathous.

Measurements and indices follow Boudinot (2014) where they are also illustrated, with the addition of CLL, CLW, MdL, CLI, PrL, and TPR (see below; PrL and TPR from Keller et al., 2014), and the following modifications: two head width measurements are taken, including and excluding compound eyes (HW in Boudinot 2014 = HW1 here); the eye index acronym (EYE) is changed to EI1 and a second eye index (EI2) is provided as a measure of lateral eye bulge in full-face view. Postpetiole height (PPH) is not measured and the postpetiole index is not calculated as the third abdominal segment of ponerines is not nodiform. The relatively large number of measurements and indices are used as it cannot be foreseen which will have value in a revision of the genus. In particular, we employ numerous indices as these capture information about individual proportionality, which is extensively useful for alpha-taxonomic work.

Measurements

HL: *Head Length.* All castes. Maximum length of head from anterior clypeal margin to posterior margin along head midline in full-face view.
TL: *Total Length.* All castes. Axial length of body, including closed mandibles; summed MdL + HL + ML + PTL + GL.
HLA: *Head Length Anterior*. All castes. Distance between a virtual line drawn from anterior margins of compound eyes to anterior clypeal margin (clypeal lobe included) midlength in full-face view.
HW1: *Head Width 1*. All castes. Maximum width of head excluding eyes in full-face view.
HW2: *Head Width 2.* Male/Gyne. Maximum width of head including eyes in full-face view.
CLL: *Clypeal Lobe Length*. Female castes. Maximum length of median clypeal lobe as a virtual line drawn from basal inflection points to apex.
CLW: *Clypeal Lobe Width*. Female castes. Width of clypeal lobe measured from basal inflection points.

MDL: *Mandible Length*. Female castes. With head in full-face view, length of mandible measured in its outer margin as the chord distance from lateral insertion to mandible apex.
SL: *Scape Length*. All castes. Maximum length of scape, excluding neck and basal condyles, in medial view from scape base middle to scape apex.
PDL: *Pedicel Length*. All castes. Maximum length of pedicel from virtual line drawn from dorsal and ventral basal curves to pedicel apex.
A3L: *Antennomere 3 Length*. Male. Maximum length of antennomere 3 in dorsal view.
AFL: *Apical Flagellomere Length*. All castes. Maximum length of distal segment of antenna, in medial view.
EL: *Eye Length*. All castes. Maximum diameter of eye with head positioned in profile view such that anterior and posterior eye margins are in same plane of focus.
EW: *Eye Width*. All castes. Maximum width of eye at an axis orthogonal to Eye Length with head oriented as above.
GL: Length of gaster. All castes. Maximum length of gaster in lateral view from the anteriormost point of first gastral segment (abdominal segment III) to the posterior most point of terminal gastral segment.
LOD: *Lateral Ocellus Length*. Male/Gyne. Maximum diameter of lateral ocellus with head oriented such that anterior and posterior lateral ocellus margins are in same plane of focus.
MOD: *Median Ocellus Length*. Male/Gyne. Maximum diameter of median ocellus in full-face view.
OOD: *Oculo-ocellar distance.* Male/Gyne. Minimum distance between lateral ocellus and compound eye.
ML: *Mesosoma Length* (= *Weber's Length*). All castes. Maximum diagonal length of mesosoma from vertex of pronotal inflection to posterior basal angle of metapleuron.
PrL: *Pronotum length.* All castes. Length of pronotum in dorsal view, measured along the dorsal midline from the anterior point of the neck to the anterior apex of mesoscutum.
MH: *Mesosoma Height*. All castes. Height of mesothorax in profile view, as a virtual line measured from the anteroventral-most point of mesopleuron to posterior apex of mesothorax.
MSL: *Mesoscutum Length*. Male/Gyne. Maximum length of mesoscutum from anterior apex to transscutal line in dorsal view.
MSW: *Mesoscutum Width*. Male/Gyne. Maximum width of mesoscutum in dorsal view.
MLL: *Mesoscutellum Length.* Male/Gyne. Maximum length of mesoscutellum from posterior limit of the transscutal line to posterior apex of mesoscutellum in dorsal view.
MLW: *Mesoscutellum Width*. Male/Gyne. Maximum width of mesoscutellum posterior to scutelloscutellar line in dorsal view.
SDL: *Spiracle to Declivity Length.* All castes. Minimum distance from the center of the propodeal spiracle to the propodeal declivity in profile view.
MFL: *Metafemur Length*. All castes. Maximum distance of the metafemur in dorsal view, measured from the distal margin of the trochanter to the metafemur apex.
MTL: *Hind Tibia Length/Metatibia Length*. All castes. Maximum length of the metatibia in dorsal view, just before the basitarsal condyle to the metatibial apex.
MBL: *Metabasitarsomere Length*. All castes. Maximum length of the metabasitarsus in dorsal view, just before the basal condyle to the apex.
PTH: *Petiole Height*. All castes. Height of petiole from apex of node to shallowest point of ventral petiolar margin as close as possible to longest axis of petiole.
PTL: *Petiole Length*. All castes. Length of petiole from anterior inflection point of petiolar node to posteriormost point of petiolar margin in profile view.

Indices

CI: *Cephalic Index*. All castes. HW1/HL*100
CS: *Cephalic Size*. All castes. (HW1+HL)/2
CLI: *Clypeal Lobe Index*. Female castes. CLL/CLW*100
MCI: *Mandibulo-cephalic Index.* Female castes. MdL*100/HL
SI: *Scape Index*. All castes. SL/HW1*100
ESI: *Eye-scape index*. All castes. EL/SL*100
SAI: *Scape-antennomere-3 index*. Male. SL/A3L*100
EI1: *Eye Index 1*. All castes. (EL+EW)/CS
EI2: *Eye Index 2*. Gyne/Male. HW1/HW2*100
EHI: *Eye-head-anterior Index*. All castes. EL/HLA*100
TPR: *Thoracic plate ratio*. All castes. PrL/(MSL+MLL)
MI: *Mesosoma Index*. All castes. MH/ML*100
MTI: *Mesoscutum Index*. Gyne/Male. MTW/MTL*100
MLI: *Mesoscutellum Index*. Gyne/Male. MLW/MLL*100
MFI: *Metafemur index*. All castes. HW/HFL*100
PTI: *Petiole Index*. All castes. PTL/PTH*100

Repositories

ANIC: Australian National Insect Collection, Canberra, Australia.
AMNH: American Museum of Natural History, New York, New York, U.S.A.
BEBC: Brendon E. Boudinot personal collection, Davis, California, U.S.A.
BMNH: The Natural History Museum, London, England.
CASC: California Academy of Sciences, San Francisco, California, U.S.A.
DZUP: Coleção Entomológica Padre Jesus S. Moure - Universidade Federal do Paraná, Curitiba, Paraná, Brazil.
FMNH: Field Museum of Natural History, Chicago, Illinois, U.S.A.
ITBC: Institute for Tropical Biology and Conservation, Sabah, Malaysia.
MCZC: Museum of Comparative Zoology Collection, Harvard, Boston, Massachusetts, U.S.A.
MHNG: Muséum d'Histoire Naturelle de la Ville de Gèneve, Geneva, Switzerland.
MNH: Museum of Natural History, University of Philippines, Los Baños, Laguna, Philippines.

MZSP: Museu de Zoologia, Universidade de São Paulo, São Paulo, Brazil.
NHMB: Naturhistrorisches Museum, Basel, Switzerland.
PSWC: Philip S. Ward personal collection, Davis, California, U.S.A.
RSPC: Rodolfo da Silva Probst personal collection, São Paulo, São Paulo, Brazil.
UCDC: The R.M. Bohart Collection, University of California, Davis, U.S.A.
USNM: National Museum of Natural History [Smithsonian], Washington D.C., U.S.A.

Results

Class Hexapoda Blainville, 1816
Order Hymenoptera Linnaeus, 1758
Suborder Apocrita Latreille, 1810
Superfamily Formicoidea Latreille, 1804
Family Formicidae Latreille, 1809
Subfamily Ponerinae Lepeletier de Saint-Fargeau, 1835

Genus *Myopias* Roger, 1861
Myopias Roger, 1861: 39. Type species: *Myopias amblyops*, by monotypy.

Differential diagnosis of male

Among Palearctic and Indomalayan Ponerinae, *Myopias* may be recognized by the following combination of characters: 1) Antennal sockets situated high on head, about two socket diameters from posterior clypeal margin; 2) compound eyes nearly circular in profile view; 3) hindwing anal cell shorter than maximum basal cell width; 4) jugal lobe absent; 5) notauli present; and 6) abdominal tergum VIII apex not spiniform.

Descriptive diagnosis of male

1) Lateral hypostomal margin unmodified.
2) Palpal formula 6,3; 5,3; 4,3.
3) Antennal toruli situated high on head, at least two antennal socket diameters from posterior clypeal margin.
4) Compound eye subspherical
5) Occipital carina present, short.
6) Notauli strongly impressed, meeting or nearly meeting at body midline, not extending posteriorly after meeting.
7) Oblique mesopleural sulcus present.
8) Epimeral lobe present, completely obscuring meso-spiracle.
9) Propodeal spiracle small, circular to elliptical.
10) Propodeal lobe present, variably developed.
11) Metacoxal cavities closed.
12) Tibial spur formula 2(1s-b,1b-p),2(1s-b,1p).
13) Pretarsal claws well-developed, hooked, edentate.
14) Costal region of forewing margin linear.
15) Venation Ogata type I or IIa (submarginal cells 1 and 2 closed, Mf2 may be reduced to absence).
16) Pterostigma well-developed.
17) Costal vein present.
18) Rs+M and Rsf2+3 tubular (submarginal cell 1 closed).
19) 2rs-m and Mf3+ tubular (submarginal cell 2 closed).
20) Marginal cell 1 closed, somewhat short: Length only slightly greater than that of submarginal cell 1.
21) 1m-cu present (discal cell 1 closed).
22) Subdiscal cell 1 closed or open.
23) Hindwing venation somewhat reduced, free abscissae R, Rs, M, and Cu spectral to absent. (When apical-most portion of free M absent, basal cell enclosed distally by 1rs-m+M).
24) Hindwing subbasal cell shorter than maximum basal cell width.
25) Jugal lobe absent.
26) Hindwing claval region reduced.
27) Petiole subfusiform to nodiform, apex of node at or posterior to petiole midlength.
28) Petiolar sternum linear in profile view, with anteroventral denticle.
29) Helcium infraaxial, narrow.
30) Prora of abdominal sternum III transverse, with variable longitudinal carinae extending from posterior margin.
31) Cinctus between abdominal pre- and post-sclerites IV distinct.
32) Striduletrum of abdominal pretergite IV present.
33) Abdominal tergum VIII visible *in situ*, apical margin linear to convex, not spiniform.
34) Abdominal sternum VIII visible *in situ*.
35) Abdominal sternum IX ligulate, apex linear to convex.
36) Pygostyles present.

Comments on diagnosis

The diagnostic characters presented above are derived from intergeneric comparison of *Myopias* with Ponerinae on a global scale, with many characters evaluated due to value recognized in a treatment of the New World males (Boudinot in prep.). At the specific level, while some male-based morphospecies of *Myopias* are more easily differentiated than others it seems that *Myopias* males are character-rich and should be relatively easy to delimit with sufficient sampling. Each character provided in the diagnosis above and described below for the male of *M. darioi* is derived from comparison with the eight morphospecies and the males of *M. chapmani*, *M. maligna*, and *M. tenuis*, and should serve as a scaffold for parsing species-level boundaries. Additional subtle variation was observed during this study but was not characterized due to the limited scope of this work.

A general picture of male interspecific variation is here developed based on comparative study of the eight morphospecies and three species. The examined species and morphospecies differ in coloration (whole body, wings and veins), body size and eye size, head shape, details of venation, mesonotum features, propodeal sculpture, size and shape of the petiole, genitalia, and characters of the metasoma. Of these body regions the petiole, propodeum, and genitalia vary most significantly. Body form of male *Myopias* seems relatively stable, with the mesosoma not undergoing drastic modification interspecifically. Additionally, setation seems quite stable, being most variable on the head and legs; no or only very sparse appressed pubescence was observed on the morphospecies.

Variation of propodeal sculpturation took these forms: A) Propodeum smooth with posteropropodeum delimited by an arcing carina (with infraspecific variation where this carina may be obliterated by stronger longitudinal carinae on the posterior face that do not extend to the metasoma) (most common form found); B) Propodeum weakly to strongly rugose, in the weakly rugose morphospecies the rugulae extend slightly up the dorsopropodeum from the posteropropodeum, while in the strongly rugose morphospecies the entire propodeum is covered; C) Dorsopropodeum with a pair of longitudinal weakly arcuate carinae extending from the metanotum to the posterior propodeal face, which is delimited by an arching carina (characteristic of one morphospecies). The propodeum also varies in shape and size; other variation occurs, but these features were observed to have most separatory value. The petiole varies from low, long, and asymmetrically fusiform (spindle-shaped), to very small with a distinct node and short peduncle. In one morphospecies the petiolar node is strong and swollen appearing, with the anterodorsal and dorsal surfaces evenly and strongly convex, nearly overhanging the posterior tergal face. Variation of the petiole is not as discrete, however, as in the propodeum. All genitalic sclerites showed characteristic variation in the species and morphospecies examined.

Since the description of *Myopias* (Roger, 1861) there been notable interest in the genus, but relatively few works have been published. We encourage study of male *Myopias* and other Formicidae. In general, male ants are rather difficult to associate with workers, but this can be resolved with careful nest collecting, the use of Malaise traps at well-sampled locales, and barcoding or other forms of genetic sequencing.

Comments on worker classification

The key presented below represents the first attempt to provide a global worker-based identification resource to the species of *Myopias*. Mandibular morphology was found the most valuable, if not the most challenging character for which to describe patterns given the remarkable diversity in mandibular form. Second to the mandibles, form of the median clypeal lobe was highly informative.

Based on the character systems evaluated during the construction of the key, future alpha-taxonomic work on the genus should carefully evaluate the following sets of characters: mandibles and median clypeal lobe shape; eye size; labrum shape and ornamentation (used frequently in Willey & Brown, 1983); proportions and shapes of the head capsule and antennomeres; form and proportion of the mesosomal sclerites, especially the propodeum; petiolar form, especially of the sternum; abdominal segment III; and sculpturation. Doubtless other characters of value will be found, and thus we provide a detailed description of *M. darioi* below.

No attempt was made during this study to formally classify *Myopias* species into groups; indeed, this task was left incomplete by Bill Brown, who suggested certain groups in Willey and Brown (1983). Some credible groups were keyed together, however, including the "*nops* complex" (*M. menba*, *M. nops*, *M. shivalikensis*) and the "*bidens* group" (*M. bidens*, *M. breviloba*, *M. castaneicola*, *M. mayri*, *M. trumani*). Other large splits in the key include heterogeneous assemblages of long-mandibulate forms (species possibly allied with *M. tenuis*) and those with mandibles that do not correspond well with other sets of species.

Myopias darioi Probst and Boudinot, new species (Figs 1–6)

Type material

Holotype worker: MALAYSIA, SABAH: Maliau Basin Studies Centre, Bird Race Trail, 4.7404041°N 116.97702°E, ± 300 m (GPS deviation), 225 m.a.s.l. , 27 July 2014, tropical rainforest, ex. nest in dead trunk (*R. S. Probst* #352) [MZSP]. *Paratype workers*: Same data as holotype [AMNH, one worker; ANIC, one worker; BEBC, one worker; BMNH, one worker; CASC, two workers; DZUP, one worker; FMNH, one worker; ITBC, 4 workers; MCZC, two workers; MHNG, one worker; MNH, three workers, MZSP, 8 workers; NHMB, one worker; PSWC, one worker; RSPC, one worker, UCDC, one worker; USNM, one worker]. *Paratype gynes*: Same data as holotype [MZSP, one gyne; MNH, one gyne]. *Paratype males*: Same data as holotype [BEBC, one male, MZSP, two males].

Diagnosis

The worker of *M. darioi* is distinguished by the following characteristics: Head slightly longer than broad, subquadrate, sides subparallel and very weakly convex; posterior head margin concave. Eyes small, round, composed of a single lenticular ommatidium; diameter 0.03–0.05 mm. Mandibles linear, robust, somewhat short; basal angle poorly defined; prebasal tooth robust, height about half length of basal blade of masticatory margin. Antennal scapes not surpassing head posterior margin in repose. Clypeal lobe subrectangular, slightly wider than long; anterolateral corners edentate, rounded; sides posteriorly divergent, anterior margin feebly convex. Mesosoma robust, subrectangular in profile, with impressed metanotal groove; dorsopropodeum almost twice as long as mesonotum. Petiolar node longer than tall in profile, node dorsum convex. Abdominal segment III with distinct cinctus (constriction) between pre- and postsclerite. Sculpture predominantly smooth and shining, with spaced, indistinct piligerous punctures, especially on head; lateropropodeum obliquely costulate; dorsopropodeum face finely roughened in part. Color light ferruginous to dark ferruginous red. *Myopias darioi* workers are most similar to *M. tenuis*, but differ as follows: Mandibles shorter, more curved, with a basal tooth; frontal lobes larger and broader; anteromedian clypeal process shorter, broader, and broadest near its base.

The gyne is similarly identifiable as the worker. At present, knowledge of male *Myopias* is too scant to develop a concise diagnosis for the male of *M. darioi*. However, male *M. darioi* may be distinguished by petiolar and subpetiolar process shape, size and shape of abdominal sternum III prora, strength of the cinctus, propodeal sculpture, and coloration as described below.

Description

Worker (Fig 1) *Measurements*, holotype: HL 1.0, TL 5.09, HW1 0.80, HLA 0.31, CLL 0.10, CLW 0.13, MDL 0.62, SL 0.67, PDL 0.15, AFL 0.41, EL 0.05, EW 0.03, PRL 0.69, ML 1.38, MH 0.63, SDL 0.22, MFL 0.72, MTL 0.70, MBL 0.57, PTH 0.45, PTL 0.50, GL 1.6. *Indices*: CI 80.0, CS 0.90, CLI 75, MCI 61.7, SI 83.3, ESI 7.50, EI1 0.09, EHI 16.2, MI 45.5, MFI 1.12, PTI 111. *Measurements*, *paratypes* (n=6 of 31, range downward from size of smallest to biggest individual): HL 0.83–1.0, TL 4.31–5.43, HW1 0.72–0.83, HLA 0.29–0.32, CLL 0.07–0.11, CLW 0.12–0.14, MDL 0.55–0.65, SL 0.56–0.72, PDL 0.13–0.18, AFL 0.33–0.40, EL 0.03–0.05, EW 0.03, PRL 0.53–0.73, ML 1.16–1.44, MH 0.50–0.64, SDL 0.17–0.22, MFL 0.59–0.75, MTL 0.58–0.71, MBL 0.48–0.57, PTH 0.38–0.45, PTL 0.42–0.50, GL 1.3-1.9. *Indices*: CI 79.0–85.2, CS 0.78–0.92, CLI 57.1–78.6, MCI 59.7–65.8, SI 77.9–87.8, ESI 5.97–7.59, EI1 0.07–0.10, EHI 11.1–17.1, MI 42.1–45.2, MFI 1.08–1.21, PTI 106.3–120.8.

Head (Fig 1A)

Head distinctly longer than broad, subrectangular; eyes situated anteriorly the middle length of head; in full-face view sides very weakly convex, widest posterad eyes and narrowing almost imperceptibly to posterolateral corners; posterior border medially concave, concavity nearly angular. Palpal formula 2,3; basal segment of maxillary palp short and broad, apical segment very long (at least five times longer than basal segment), slender and with an apical sensillum about ½ of its length. Labial palpi each with 3 segments; basal segment about twice as long than second segment, with 2 adjacent proximal sensilla; second segment with one submedian lateral sensillum; third segment "bottleneck"-like, slightly longer than the basal segment, with 3 apical sensilla. Labrum bilobed apically, each labral lobe bearing apically a slightly upturned tooth (in some specimens, almost impossible to see without dissection).

Mandibles robustly linear and subfalcate, comparatively short, downcurved in profile view, with four teeth; basal angle poorly defined but distinct; basal blade of masticatory margin from basal angle to base of prebasal tooth less than half length of inner mandibular margin; prebasal tooth robust, height slightly shorter than half basal blade length from basal angle; diastemma between prebasal tooth and next tooth slightly shorter than inner mandibular margin; apical tooth sharp, subtended by minute and sharp subapical tooth; distinct, isolated, submedian tooth present situated basad (approximately 0.12 mm) from subapical tooth, both subapical and prebasal teeth blackened and narrowly rounded apically. Mandibular oblique basal groove present, lateral continuation very distinct. Median clypeal lobe subquadrate, slightly wider than long (CLL 0.10 mm, CLW 0.13 mm), with sides weakly concave and slightly divergent anteriorly, widest at base; anterior margin roughly linear; lateral and anterior margins meeting at nearly 90°. Compound eye reduced, lenticular, consisting of a 4–5 unpigmented ommatidia (pigmentation

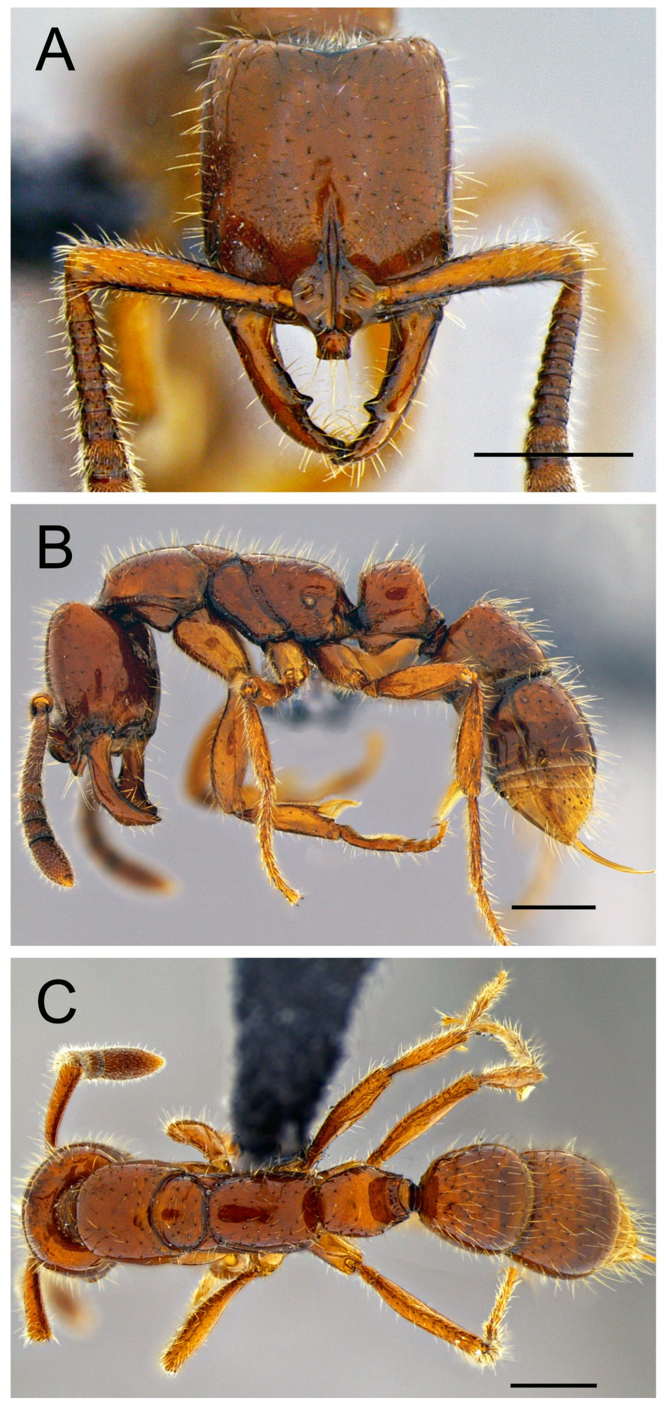

Fig 1. *Myopias darioi* holotype worker; scale bars 0.5 mm. **A.** Head, full-face view. **B.** Body, profile view. **C.** Body, dorsal view.

and size variable in paratypes), with strong furrow extending dorsad orbital groove forward onto lateral clypeal portion. Frontal lobes long and very broad, slightly translucent. Median longitudinal frontal sulcus deep, widest posterad frontal lobes, extending slightly beyond midlength of head as measured from clypeal process. Antennal scapes somewhat robust in comparison with other *Myopias* species, moderately bowed, slightly incrassate; not exceeding posterior head margin in full-face view. Pedicel longer than wide; funicular segments I to VI wider than long, followed by an indistinctly 4-merous club; club longer than wide, apical antennomere slightly longer than antennomeres IX and X combined.

Mesosoma (Fig 1B,C)

Mesosoma robust; mesosomal dorsum nearly linear in profile view, mesonotum raised anteriorly above pronotum and propodeum, sloping caudad, about ⅓ length of dorsopropodeum; meso-metanotal groove distinct, narrow. Mesonotum about ⅔ length of pronotum in dorsal view. Propodeum subrectangular in profile view, dorsopropodeum nearly linear in profile view, weakly convex, round into posteropropodeum at somewhat more than 90°; propodeum with feeble median impression where dorso- and posteropropodeum meet; declivity more or less flat, with lateral boundaries distinct, submarginate. Pronotal anterior and dorsal faces meeting at slightly more than 90° in profile view, this anterodorsal margin subangular; dorsal face slightly more convex than dorsopropodeum. Propleurae anteroposteriorly wide in profile view; meso- and metatibiae each with one simple and one pectinate spur, protibial calcars large; ventrolateral apical protibial margin with row of stout lamellar setae. Meso- and metasternal process present; mesosternal process well developed (about ⅙ length of mesocoxae), its apex acute and slightly curved. Mesosternal process narrower, its apex more rounded. *Metasoma* (Fig 1B,C) Petiolar node subcuboidal, slightly taller than wide in profile view; dorsal face weakly convex, highest posterad midlength; anterior face straight to feebly concave in profile view, sloping posterodorsally; posterior face convex in side view sloping anterodorsad. In dorsal view, anterolateral corners of node very prominent; node widest behind, with sides convex, slightly wider than long. Subpetiolar process large, vaguely wedge-shaped; anterior margin short, oriented dorsoventrally; anteroventral margin longer, oblique, obtusely rounding into longer, sinuate posteroventral margin.

Abdominal tergum III almost as broad as long in dorsal view, anterodorsal border slightly concave medially. Abdominal sternum III prora robust, triangular, margined by strong, transverse, anterior carina. Abdominal tergum IV slightly wider and longer than tergum III in dorsal view; cinctus distinct, wide, and cross-ribbed. Sting long, sharp, upcurved (extended up to 0.59 mm in the holotype and some paratypes). *Sculpture* Mostly smooth and shining, with regular, inconspicuous, dilute piligerous punctures; on head dorsum laterad midline, piligerous punctures numerous, small, averaging about 0.01 mm in diameter or smaller, mostly in space between eye and median sulcus; small piligerous punctures distributed very sparsely on mandibles, postgenal bridge, genae, pronotum, mesonotum, and metasomal terga. Moderately coarse piligerous punctures present on petiolar node and remaining abdominal terga. Antennae and legs mainly smooth and shining, very finely punctate, punctation density increasing apically. Lateropropodeum with fine, oblique costulation, rising caudad. Propodeal declivity anterodorsally feebly, finely, transversely strigulose, smooth and shining below. Anteroposterior carinulae present on petiolar tergum. *Setation* Consisting of somewhat fine, filiform, erect to suberect setae of uneven length (from 0.03 to 0.15 mm long), distributed over dorsal surfaces of body, venter of head, metasoma, fore coxae, and most surfaces of appendages; more abundant on the apex of gaster dorsa. Mandibles bearing short to elongate (at its apex) filiform setae. Anterior portion of petiolar peduncle bearing erect and short hard setae, anterior portion of subpetiolar process bearing filiform, suberect and posteriorly curved hairs. Decumbent pubescence is present on anteromedian pronotal lobe, directed mesad; denser on anterior surfaces of mid coxae, and on all tibiae and tarsi. *Coloration* Color ferruginous red; appendages and metasomal apex slightly lighter. *Variation* Noticeable size variations between workers in mesosoma width, scape, gaster, hindtibia, and total length. Distinctness and density of punctures varies from fine and sparse in small specimens to coarse and denser in large specimens, mostly on head dorsum, in space between eyes and median sulcus; little variation present on mesosoma, and metasomal tergites. In some specimens subpetiolar process may be more produced or less produced at mid-length, and posteroventral margin angled instead of sinuate. Coloration varies from light to medium ferruginous red to dark brownish red; some workers, possibly callow, light orange brown.

Gyne (Fig 2) *Measurements* (n=1): HL 1.08, TL 6.07, HW1 0.90, HLA 0.23, CLL 0.12, CLW 0.17, MDL 0.67, SL 0.78, PDL 0.19, AFL 0.41, EL 0.32, EW 0.27, LOD 0.08, MOD 0.08, OOD 0.45, PrL 0.67, ML 1.66, MH 0.91, MTL 0.63 MTW 0.72, MLL 0.28, MLW 0.33, SDL 0.24, MFL 0.83, MTL 0.77, MBL 0.63, PTH 0.52, PTL 0.53, GL 2.1. *Indices*: CI 83.7, CS 0.99, CLI 70, MI 88.9, SI 86.1, ESI 40.9, EI1 0.59, EI2 90.0, EHI 136, TPR 0.41, MI 54.7, MTI 115, MLI 118, MFI 1.09, PTI 103.

Specimen description of dealate gyne, differing from associated worker by following: Body slightly longer, darker in color, prevailingly piceous. Promesonotal articulation deeply impressed, mesoscutum trapezoidal with slightly protruding borders, anterior edge convex in dorsal view; in profile view, its anterior portion slightly bulged and smoothly curved caudad. Parapsidal lines directed anteriorly from transscutal suture to mesoscutal disc, running along the parascutal carina; slightly divergent anteriorly. Tegulae well developed. Scutoscutellar sulcus present. Scutellum hexagonal, sides depressed, costulae surround depressions alongside wing bases. Metanotum present, anterior face straight, posterior face slightly convex. Oblique mesopleural furrow linear, directed posterodorsally. Upper metapleuron [metanepisternum] oblong. Metanotal-propodeal sulcus deeply impressed. Posterior face of propodeum flat. Propodeal spiracle rounded, accommodated into lateropropodeal excavation. Anterior face of petiole more oblique than in workers, narrowing upward. Gaster relatively larger than in the worker. *Sculpture* Punctae coarser on head, in space between eye, and around median sulcus. Posterior region of lateropronotum with small costulae, punctures present on anteromarginal area of mesoscutum and anterodorsal margin of dorsopropodeum. Longitudinal striations present in part of propodeal declivity. Sculpture on lateropropodeum similar to workers, but deeper, costulation present on lateroposterior region of petiole in profile view. *Setation* Pubescence between the frontal lobes and anterior portion of eyes more marked than in workers. Suberect pilosity slightly more abundant on pronotal dorsum. Sterna of gaster bearing more abundant pilosity than the conspecific workers. *Coloration* Frons, except area adjacent to frontal surface, temple, and clypeal margin infuscated, resembling an inverted Y. On mesosoma, centers of mesoscutum and scutellum are blackish; marginal areas of these and other sclerites lighter, more reddish; abdominal tergites III and IV similarly colored. Appendages lighter, brownish red.

Male (Figs 3, 4) *Measurements* (n=2): HL 0.55–0.56, TL 3.55–3.83, HW1 0.53, HW2 0.63–0.65, HLA 0.11, MdL 0.13–0.15, SL 0.13, PDL 0.1, A3L 0.21–0.22, AFL 0.30–0.32, EL 0.28, EW 0.20–0.21, LOD 0.07–0.08, MOD 0.07, OOD 0.18, PRL 0.20–0.21, ML 1.20–1.22, MH 0.75–0.78, MTL 0.53–0.57, MTW 0.55–0.58, MLL 0.15, MLW 0.27–0.28, SDL 0.18–0.19, HFL 0.69, HTL 0.64–0.65, MbL 0.53–0.56, PTL 0.33–0.35, PTH 0.30, GL 1.3-1.6. *Indices*: CI 92.7–97.0, CS 0.54–0.55, MCI 24.2–26.5, SI 23.4–25.4, ESI 213–227, SAI 60.0–61.5, EI1 0.89–0.92, EI2 82.1–82.9, EHI 262–283, TPR 0.37–0.38, MI 61.5–64.9, MTI 103–105, MLI 124–127, MFI 0.76–0.78, PTI 111–117.

Head (Fig 3A)

Head longer than broad, excluding eyes. Palpal formula 5,3, with third maxillary palpal segment shorter than the fourth, and second labial palpomere broader and shorter than the first. Labrum trapezoidal, length from base to apex slightly less than maximum width of mandibles. Mandibles subspatulate, medial and lateral margins subparallel and terminating in a triangular apex. Clypeus in profile view weakly convex, not bulging. Antennal toruli separated from anterior tentorial pits by more than two maximum antennal socket diameters. Compound eyes somewhat large, taking up about one-third head length in profile view. Medial compound eye margin linear, posterior eye margin weakly emarginate. *Mesosoma* (Figs 3B, C) Anterior pronotal margin well-developed bulging, oriented dorsoventrally (perpendicular to cephalocaudal axis). Propleuron without distinct ventrolateral process. Mesoscutum about as broad as long. Notauli V-shaped and not meeting medially. Parapsidal lines clearly impressed, directed anterolaterally, slightly parallel to parascutal flange and extended to posterior limit of notaulus. Mesepimeron strongly produced posterodorsally dorsad spiracular sclerite. Oblique mesopleural furrow linear, directed posterodorsally, with small posteriormost section bent and directed posteriorly. Metascutellum ecarinate medially and not produced posteriorly. Disc of dorsal metapleuron lenticular in shape. Anterodorsal metapleural margin not emarginated to receive spiracular sclerite. Dorsolateral metacoxal margin

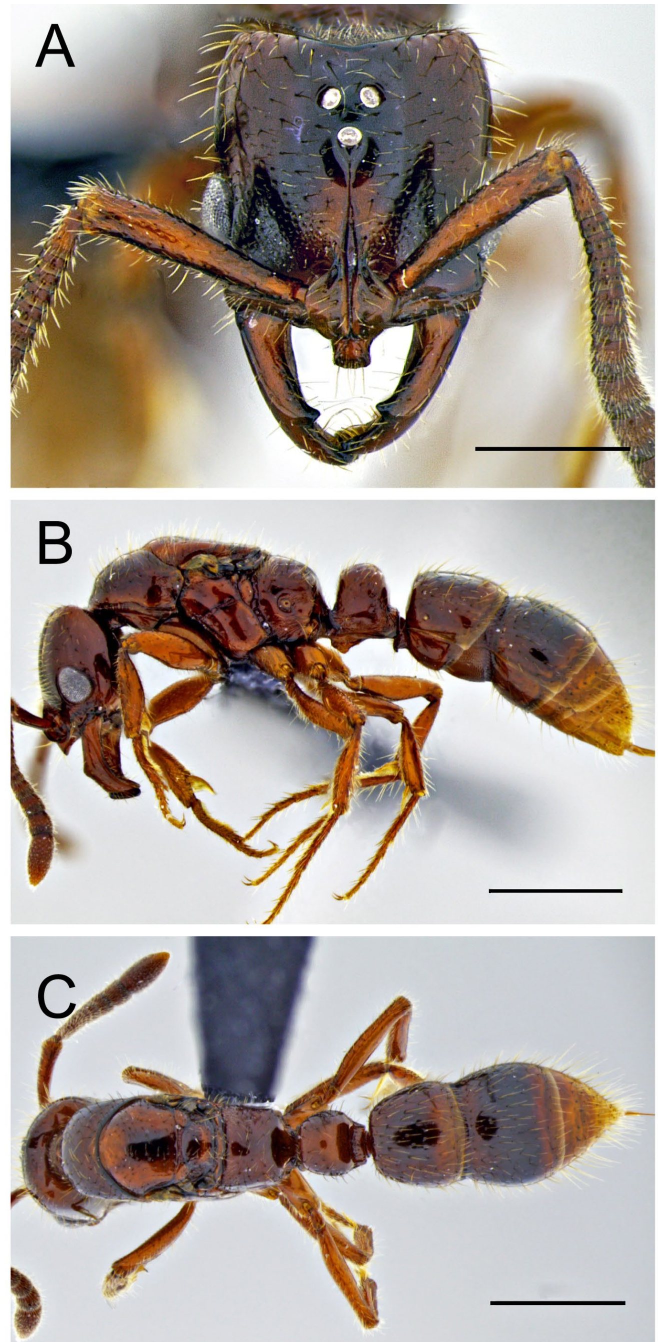

Fig 2. *Myopias darioi* gyne; head scale bar 0.5 mm, all others 1.0 mm. **A.** Head, full-face view. **B.** Body, profile view. **C.** Body, dorsal view.

subangular. Propodeum posteriorly elongate, dorsopropodeum and posteropropodeum differentiated by carina in profile view and about equal in length. Two tibial spurs on each middle and hind leg (one simple, one pectinate), fore legs with one pectinate spur. Distal margin of each metatibia bearing a row of hard lamellar setae at its lateroventral portion. Probasitarsal notch comb present, extending from the apex to middle portion of probasitarsomere. *Metasoma* (Figs 3B, C) Petiole nodiform; apex situated posterad petiole midlength. Petiolar tergum anterodorsal face weakly concave, node strongly and anteroposteriorly narrowly convex, node dorsum not overhanging linear posterior face. Petiolar tergum anterolateral corners carinate but not strongly produced, not translucent; in dorsal view anterolateral processes simple, rounded, not angular or flanged. Petiolar sternum in profile anteroventrally lobate, lobe truncate and margined anteriorly and laterally by carinae; carinae diverging toward midlength then converging posteriorly; posterior two thirds of sternum tapering and sinuate in profile view. Abdominal tergum III slightly swept back. Abdominal sternum III prora strong, bulging, triangular in profile view, anteriorly carinate, and with four subparallel short strong carinae extending posteriorly from anterior margin, and lacking median carina. Abdominal sternum IV with weak median depression bordered by weak swelling which form low welts near posterior margin. Cinctus between abdominal pre- and postsclerites IV strong, deep, crossribbed, and very broad.

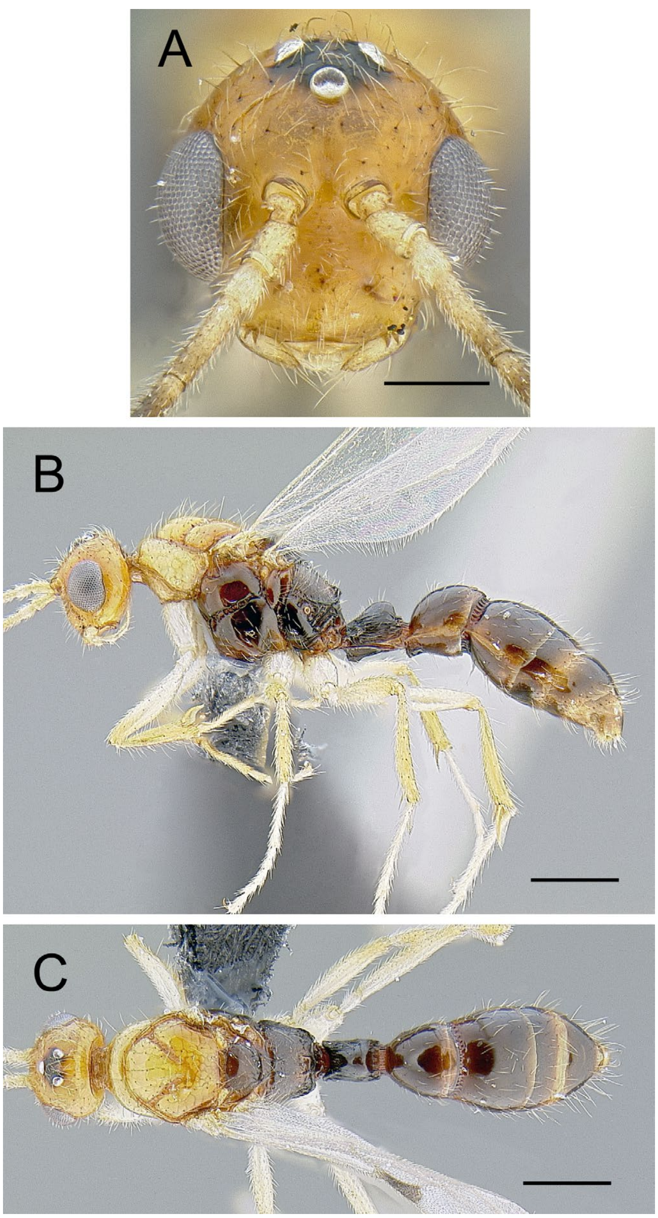

Fig 3. *Myopias darioi* male; full-face view scale bar 0.1 mm, all others 0.5 mm. **A.** Head, full-face view. **B.** Body, profile view. **C.** Body, dorsal view.

Forewing (Figs 4A) Rsf1 and Mf1 nearly parallel, Mf1 distinctly curved. Mf2 absent, Rs+M with second abscissa distad 1m-cu. 2rs-m juncture with Rsf distad 1r-rs. Mf1 diverging from M+Cu distad cu-a. Submarginal cell 2 slightly shorter than marginal cell 1. *Hindwing* (Fig 4B) R+Rs extending tubularly well beyond 1rs-m.

Sculpture Piligerous punctae weakly impressed. Clypeus smooth, without raised sculpture. Posterior mesoscutal margin without striations. Dorsopropodeum without longitudinal carinae, although anteroposteriorly short paired carinae occur near the anterior propodeal margin and along the posterior margin of the dorsopropodeum. Lateropropodeum with four transverse parallel carinae. Posteropropodeum completely set off by strong carina. Propodeum otherwise mostly smooth and shining. Petiolar tergum predominantly smooth and shining, with lateral longitudinal carinulae. *Genitalia* See figures 4C–I. *Setation* Mandibular dorsum bearing four long and filiform setae, clypeus, frons, and vertex with dense, shaggy-appearing setae. Funicular antennomeres with long subdecumbent setae in addition to short appressed setae. Compound eyes bearing interommatidial setae. All femora and tibiae with distinctly elongated erect setae sparsely distributed among denser shorter erect to subdecumbent setae. Propodeum dorsolaterally with dense patch of setae. Gaster with sparsely erect to suberect filiform setae. *Coloration* Exceptional. Head bright orange, more yellow around mouthparts; mandibles and palps light yellow; ocellar area infuscated. Scape honey yellow, pedicel light yellow, antennomere 3 light yellow to brownish honey yellow apically, antennomere 4 all dark, becoming progressively darker until black; apex of antennomere 13 golden yellow. Pronotum and propleurae honey yellow. Mesoscutum bright orange, more yellow anteriorly; axillae honey yellow, mesoscutellum black. Mesopectus predominantly black, fading to brownish-golden toward margins. Metascutellum black, lateral metascutellar areas lighter. Lower metapleuron black, becoming brownish-golden near metapleural gland area; upper metapleuron nearly black, becoming lighter near margins; spiracular sclerite golden yellow. Propodeum almost entirely black, lighter near dorso-posteropropodeal margin and petiolar foramen. Petiole almost entirely black, becoming lighter near posterior collar; laterotergum brownish-golden. Abdominal terga III-VIII and

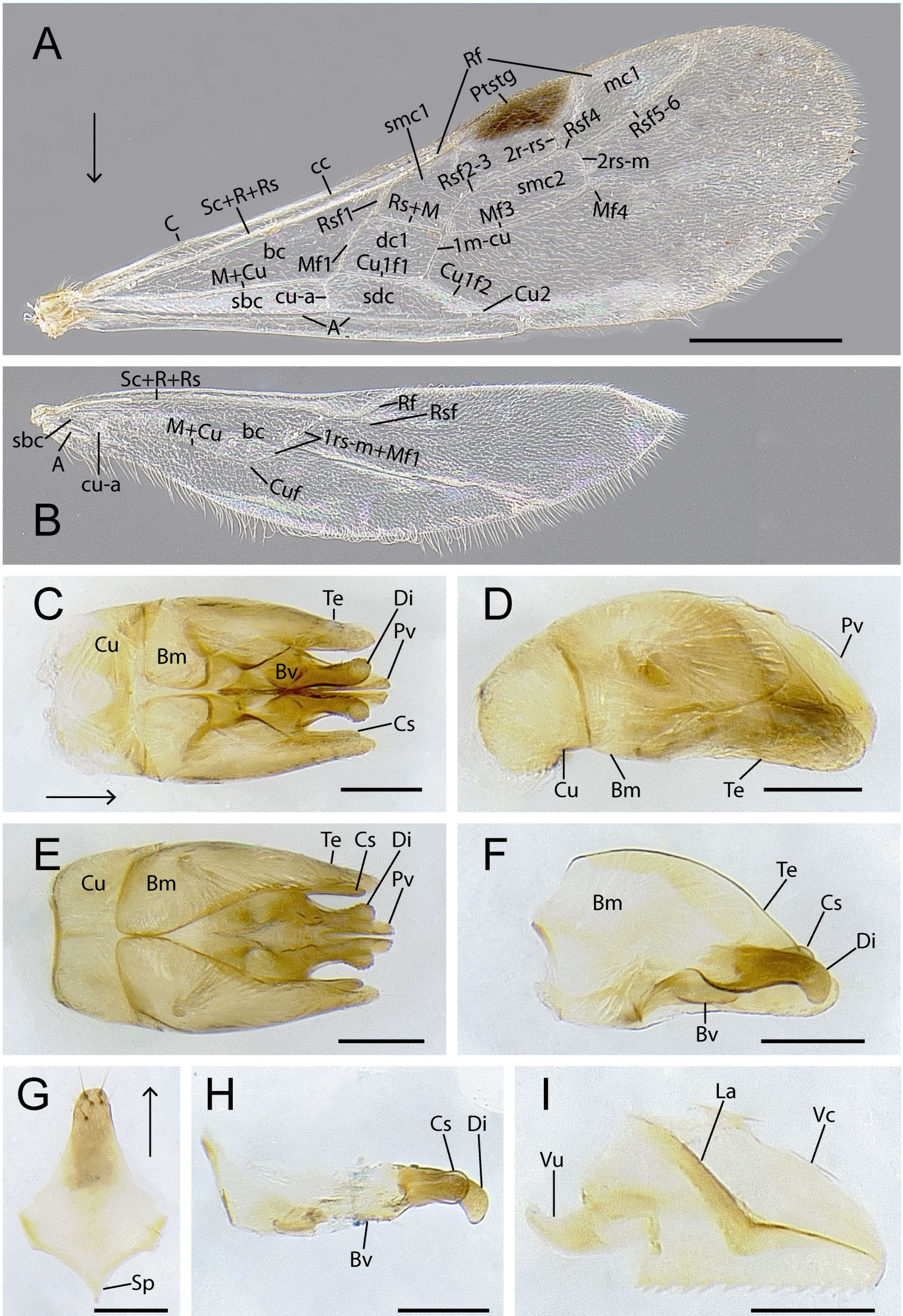

Fig 4. *Myopias darioi* male; wing scale bars 0.5 mm, genitalia 0.1 mm. **A.** Forewing, dorsal view. **B.** Hindwing, dorsal view. **C.** Genital capsule, ventral view. **D.** Genital capsule, lateral view. **E.** Genital capsule, dorsal view. **F.** Paramere and volsella, mesal view. **G.** Abdominal sternum IX, ectal view; arrow indicates posterior. **H.** Volsella, lateral/mesal view. **I.** Penisvalva, ectal view. Genitalia abbreviations: Bm, basimere; Bv, basivolsella; Cs, cuspis; Cu, cupula; Di, digitus; La, lateral apodeme; Pv, penisvalva; Sp, spiculum; Te, telomere; Vc, valviceps; Vu, valvura.

sterna III-IX mostly dark brown, becoming brownish-golden along lateral and posterior margins; segments becoming slightly lighter near posterior terminus. Coxae and trochanters white; femora light yellow basally to golden yellow apically; tibiae golden yellow; protarsomeres light yellow, meso- and metatarsomeres white with yellowed apical margins. Wing veins lightly pigmented, mostly clear, white, or yellowish.

Immatures (Fig 5)

Final-instar larva: length (through spiracles) about 2.6 mm. Body shape platythyreoid, thoracic segments forming long and slender neck (Fig 5A), entire integument spinulose. Cranium anteriorly elongate, anteroposterior length slightly less than twice dorsoventral height in profile view, and a third longer than broad in dorsal view, subelliptical. Antennae highly posteriorly positioned. Labrum subtrapezoidal, length subequal to width, and posterior surface spinulose. Mandibles dinoponeroid, apices directed slightly ventrally, curved and nearly completely exposed, moderately sclerotized, long and with two short subapical teeth on the inner border. Abdomen subovoid, anus ventrally positioned (Fig 5D). Ventral surfaces of thoracic segments with numerous rows of posteriorly projecting spinules (Fig 5E). Tubercles on body moderately numerous

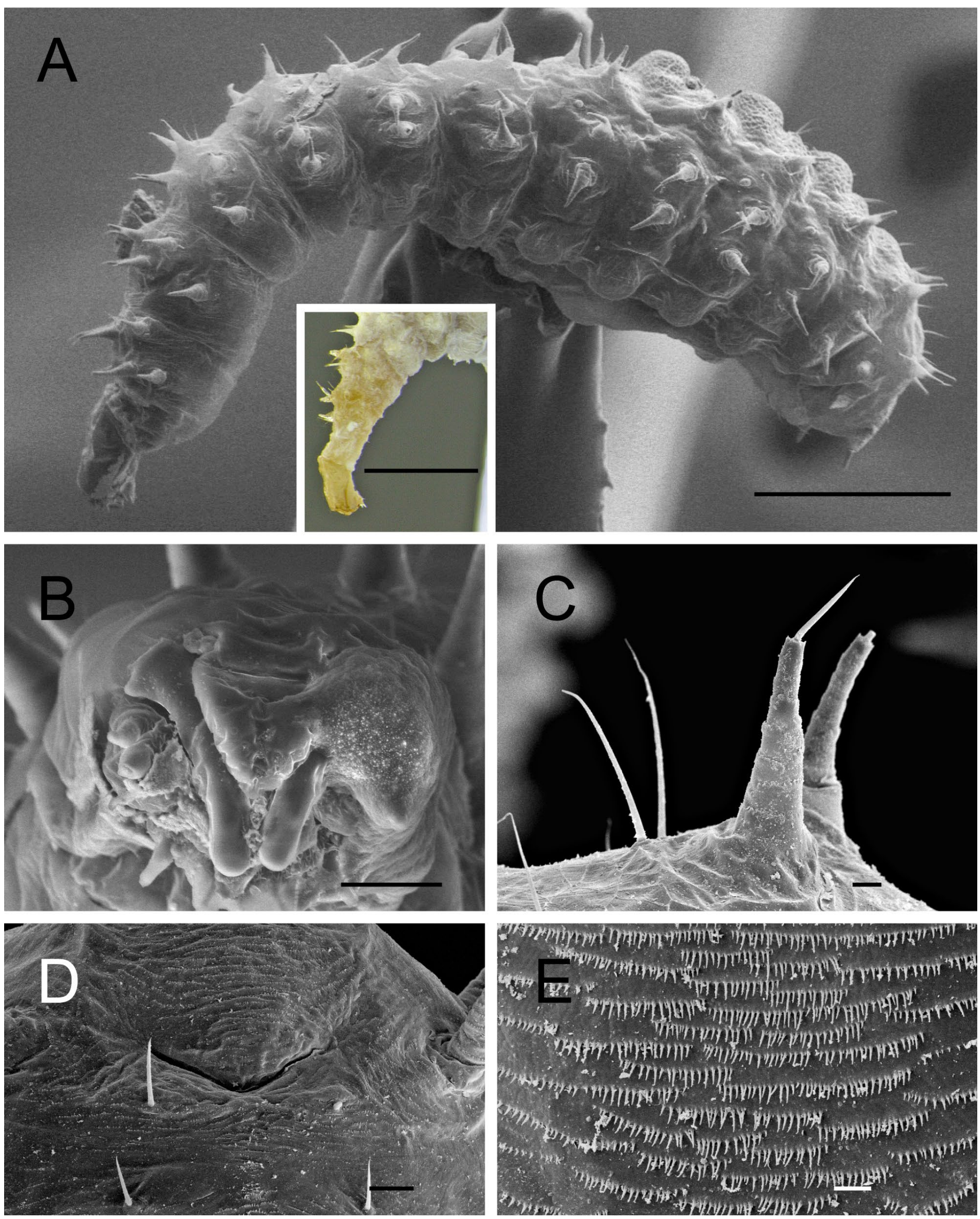

Fig 5. *Myopias darioi* mature larva and pre-pupa; scale bars: D = 0.30 um; A, A inset = 0.5 mm; B = 50 um; C & E = 10 um. **A.** Pre-pupa, lateral view. **B.** Pre-pupa head, anterior view. **C.** Larval lateral thoracic tubercle, profile view. **D.** Larva, lateral view. **E.** Ventral pre-pupa spinules.

(80–90), subconical, with an integumentary spinule on the apex and often with simple setae near its base (Fig 5C); each thoracic segment with one lateral subconical tubercle while each abdominal segment except AX with two (Fig 5A). *Pre-pupa:* similar in size compared to full grown larva (Fig 5A), same body shape and integumental protuberances - see Fig 5B for frontal view. Numerous rows of posteriorly projecting spinules on the ventromedial surface of thoracic segments (Fig 5E).

Etymology

The epithet of this species honors Dario D'Eustacchio, a myrmecologist and one of the participants in the 2014 Ant Course. He was a Ph.D. student at the University of Rome. He died tragically in a car accident shortly after; the authors mourn his loss.

Locality record

Known only from the Maliau Basin Studies Center of Sabah, Malaysia.

Remarks

While it is generally not favorable to describe a single species in isolation, we consider *M. darioi* to be an exception. This is the first species of *Myopias* to be known from all castes and is described with potentially valuable natural history observations. Based on an examination of types of 20 species (*M. bidens*, *M. castaneicola*, *M. chapmani*, *M. concava*, *M. cribriceps*, *M. delta*, *M. densesticta*, *M. julivora*, *M. latinoda*, *M. lobosa*, *M. loriai*, *M. maligna*, *M. maligna punctigera*, *M. mayri*, *M. modiglianii*, *M. nops*, *M. shivalikensis*, *M. tasmaniensis*, and *M. tenuis*) and critical reading of all original descriptions, this species was found to be too distinct to be placed into any prior taxon.

Although the available keys are limited in scope and taxon sample, it is instructive to understand how *M. darioi* fares with these tools. *Myopias darioi* runs to couplet five in the key of Xu et al. (2014), where it fails as the worker has a median clypeal lobe which is about as broad as long, basal mandibular tooth robust and acute, and petiolar node about as broad as long and lateral faces narrowing anteriorly in dorsal view. Regardless of how close the match between *M. darioi* and *M. bidens* or *M. philippinensis* may be in the key, *M. darioi* differs starkly in having the anterior margin of the median clypeal lobe linear (rather than bidentate), the eyes strongly reduced (rather than large and conspicuous), and the basal mandibular tooth situated basally on the masticatory margin, among several other characters. In the keys of Emery (1900) and Willey and Brown (1983) *M. darioi* keys to *M. tenuis*, but may be distinguished from all other described species, and *M. tenuis* in particular, by characters indicated in the diagnosis above.

Key to valid *Myopias* species, worker-based

Notes: Absolute characters are indicated by a full stop; these characters are sufficient alone to separate the particular taxon from the others being contrasted. Polythetic characters for which multiple conditions must be met are separated by semi-colons (consider them as boldface "and" conditional statements). Two Bill Brown morphospecies are difficult to key, but may be distinguished from described species as follows: "axinipelta" has a remarkably large median clypeal lobe, with strongly anteriorly-divergent lateral margins and a distinctly-margined wedge-shaped dorsal face; "lacunosa" has an almost perfectly rectangular head, with completely parallel, linear lateral margins, coarse lacunate sculpture, and very short, robust scapes. The following species were excluded: *M. kuehni* (Forel, 1902), a gyne-based species; *M. papua* Snelling, 2008 and *M. philippinensis* (Menozzi, 1925), as they cannot be confidently placed in the key; and the subspecies *M. bidens polita* (Stitz, 1925) and *M. maligna punctigera* (Emery, 1900). Additionally, species related to *M. tenuis* are the least likely to key successfully, as there are new species to be described and valid taxa need re-evaluation. Regard this as a heuristic, coarse, preliminary key that requires testing with a broader intraspecific sampling and that will benefit from more refined character evaluation (see "Comments on worker classification" section above).

1 Mandible elongate; in full-face view lateral margin convex; prebasal tooth strongly produced medially, subtended by short masticatory margin blade which diverges medially relative to lateral margin, and followed by strong concavity (Fig 7A) .... ***M. concava* Willey & Brown, 1983**
- Mandible elongate or short; in full-face view lateral margin convex or linear; prebasal tooth **not** strongly produced medially, subtended by short or long masticatory margin blade which may or may not be divergent relative to lateral margin, and **not** followed by strong concavity …….. **2**

2 Masticatory mandibular margin with conspicuously produced basal angle followed by a distinct concavity; masticatory margin blade between basal angle and prebasal tooth subequal in length to mandibular inner margin (Fig 7B). Median clypeal lobe apical margin concave, apicolateral corners conspicuously dentate (7B)…... **3**
- Masticatory mandibular margin usually without, but sometimes with conspicuously produced basal angle, if basal angle somewhat produced, then margin following linear to convex; masticatory margin blade between basal angle and prebasal tooth usually conspicuously shorter or longer than mandibular inner margin. Median clypeal lobe apical margin concave to convex, apicolateral corners rounded to angled … **7**

3 Compound eye well-developed; maximum diameter longer than malar space length (Fig 7C) ....… **4**
- Compound eye reduced; maximum diameter shorter than

malar space length (Fig 7D) …... **5**

4 Median clypeal lobe length subequal to width in full-face view (Fig 7E) ….............................. ***M. bidens* (Emery, 1900)**
- Median clypeal lobe length considerably less than width in full-face view (Fig 7F) …...... ***M. breviloba* (Wheeler, 1919)**

5 Anterior mesonotal margin raised well above posterior margin in profile view; mesonotal dorsum forming angle with propodeal dorsum … ***M. castaneicola* (Donisthorpe, 1938)**
- Anterior mesonotal margin not or barely raised above posterior margin in profile view; mesonotal dorsum more-or-less continuous with propodeal dorsum, excluding metanotal impression ....… **6**

6 Median clypeal lobe comparatively large; anterolateral denticles pronounced. Scapes not reaching posterior head margin in full-face view. Lateral head margins weakly convex (Fig 7G) …......................... ***M. mayri* (Donisthorpe, 1932)**
- Median clypeal lobe comparatively small; anterolateral denticles weak. Scapes surpassing posterior head margin in full-face view. Lateral head margins strongly convex (Fig 7H) …...................................... ***M. trumani* (Donisthorpe, 1949)**

7 Median clypeal lobe absent or strongly reduced and without distinct apicolateral corners ….. **8**
- Median clypeal lobe present, with or without distinct apicolateral corners ....… **10**

8 Mandible length in full-face view about equal to half head width. Prebasal tooth extremely robust, larger than compound eye …... ***M. amblyops* Roger, 1861**
- Mandible length in full-face view greater than half head width. Prebasal tooth not robust, smaller than compound eye ....….... **9**

9 Prebasal tooth recurved in full-face view. With head in profile view, basal half of masticatory margin strongly produced anterodorsally, forming spectacular lobe …........... ***M. lobosa* Willey & Brown, 1983**
- Prebasal tooth directed medially in full-face view. With head in profile view, basal half of masticatory margin not produced anterodorsally ....… ***M. cribriceps* Emery, 1901**

10 Head, mesosoma, and metasoma nearly completely covered with fine sculpture, rendering cuticle somewhat opaque (Fig 8A) ....**11** [note: a Bill Brown morphospecies, "blanadelphe", keys here; distinguishing characters are uncertain]
- Head, mesosoma, and metasoma not covered with very dense fine sculpture; cuticle predominantly shining, even if sculpture present (Fig 8B) ....… **13**

11 Petiolar sternum bidentate; subpetiolar process followed by second triangular process. Compound eyes absent … ***M. nops* Willey & Brown, 1983**
- Petiolar sternum unidentate; subpetiolar process not followed by second triangular process. Compound eyes represented by single pin-prick-like facets ....… **12**

12 Posterior head margin angularly concave in full-face view. Lateral margins of median clypeal lobe parallel. Dorsal face of petiole convex in profile view ..…. ***M. shivalikensis* Bharti & Wachkoo, 2012**
- Posterior head margin more-or-less linear in full-face view, but not angularly concave. Lateral margins of median clypeal lobe converging apically. Dorsal face of petiole linear in profile view .... ***M. menba* Xu & Liu, 2011**

13 Mandible somewhat (Fig 8C) to extremely elongate (Fig 8D) and linear in full-face view; lateral margin linear and parallel or slightly subparallel with medial margin for most of mandibular length; basal mandibular margin considerably shorter than inner mandibular margin; basal mandibular margin oriented more-or-less subparallel with chord length of mandible, thus basal mandibular blade narrow ...….... **14** [note: a Bill Brown morphospecies, "pisinna", keys here, and may be differentiated from subsequent species by the honey-yellow coloration, short scapes, and mandibular form]
- Mandible neither elongate nor linear in full-face view; lateral margin convex and not parallel with medial margin; basal mandibular margin well-developed, longer than inner mandibular margin; basal mandibular margin divergent from chord-length of mandible, thus basal mandibular blade broad ….................... **31**

14 Head smooth, with or without dilute weak punctae. Median clypeal lobe lateral margins parallel to weakly diverging apically …... **15**
- Head with distinct, fine-to-coarse, conspicuous punctures or foveae, or head striate. Median clypeal lobe lateral margins parallel, converging apically or strongly diverging apically …............................ **23** [note: a Bill Brown morphospecies, "epeirica", keys here, and may be differentiated from the following species by presence of dense pubescence on the head, legs, and antennae]

15 Median clypeal lobe about three times as long as broad .... ***M. xiphias* (Emery, 1900)** [note: placed based on description in Emery (1900)]
- Median clypeal lobe at most twice as long as broad **16**

16 Frontal lobes expanded, maximum lateromedial width almost twice anteroposterior length of median clypeal process. Basal blade of mandibular masticatory margin from basal angle to base of prebasal tooth shorter than basal mandibular margin. Prebasal tooth robust, length slightly less than half width of basal blade. Subpetiolar process wedge-shaped, anteroposteriorly broad and dorsoventrally tall in profile view. Compound eyes reduced (~ 5 facets); antennal scapes robust and short, not reaching posterior head margin in full-face view .…........... ***M. darioi***

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- Frontal lobes not as expanded, maximum width less twice median clypeal lobe length, although may be about as broad as lobe. Basal blade of mandibular masticatory margin longer than basal mandibular margin. Prebasal tooth fine or robust, but considerably shorter than basal blade length. Subpetiolar process not as above: fine and subrectangular or somewhat broad and anteroventrally truncate, dorsoventrally short. Compound eyes reduced, represented by one to several facets, or eyes large (> 7 facets); antennal scapes robust or slender, reaching posterior head margin or not …... **17**

17 Propodeum weakly to strongly convex in profile view; meeting mesonotum at distinct angle **18**
- Propodeum sublinear in profile view; more-or-less continuous with mesonotum **19**

18 Compound eye composed of over 20 ommatidia. Basal blade of mandibular masticatory margin subequal to length of basal mandibular margin. Propodeal dorsum smoothly convex in profile view .... ***M. latinoda* (Emery, 1897)**
- Compound eye composed of less than 20 ommatidia. Basal blade of mandibular masticatory margin considerably longer than basal mandibular margin. Propodeal dorsum unevenly convex in profile view .... ***M. chapmani* Willey & Brown, 1983**

19 Compound eyes small, with less than 10 ommatidia … **20**
- Compound eyes large, with over 10 ommatidia .... ***M. crawleyi* (Donisthorpe, 1941)** and ***M. levigata* (Emery, 1901)** [note: placement here based on original descriptions in Crawley (1924) and Emery (1901); supposedly these two species may be distinguished by scape length, with *M. crawleyi* having scapes which barely fail to reach the posterior head margin and *M. levigata* having scapes which slightly exceed the posterior head margin]

20 Compound eye composed of ≥ 4 ommatidia ...... ***M. emeryi* (Forel, 1913)**
- Compound eye composed of ≤ 3 ommatidia .... **21** [note: ***M. santschii*** Viehmeyer, 1914 keys here based on the original description, but cannot be confidently placed further]

21 Scapes failing to reach to reaching posterior head margin when laid back in full-face view. Small; head width < 0.70 mm …... ***M. tenuis* Emery, 1900**
- Scapes overreaching posterior head margin when laid back in full-face view. Larger; head width > 0.90 mm **22**

22 Prebasal tooth situated at about mandibular midlength. Head capsule nearly broad as long (HW/HL*100 = 99). Mandibles robust …........... ***M. media* Willey & Brown, 1983**
- Prebasal tooth situated at about distal third of mandible. Head capsule longer than broad (HW/HL*100 ~ 90). Mandibles thin .... ***M. julivora* Willey & Brown, 1983**

23 Median clypeal lobe lateral margins strongly divergent apically, meeting apical margin at pronounced angles (Fig 8E) **24**
- Median clypeal lobe lateral margins parallel, convergent, or weakly divergent apically, meeting apical margin at rounded angles **27**

24 Abdominal terga III and IV smooth and shining **25**
- Abdominal terga III and IV foveate **26**

25 Metanotal impression conspicuous. Smaller; head width < 1 mm. Scapes robust; maximum width longer than malar space length .... ***M. maligna* (F. Smith, 1861)**
- Metanotal impression weak, inconspicuous. Larger; head width > 1 mm. Scapes slender; maximum width shorter than to subequal to malar space length ..... ***M. hollandi* Forel, 1901**

26 Scapes long, reaching or surpassing posterior head margin when laid back in full-face view. Petiolar sternum linear posterior to anteroventral tooth in profile view. Petiolar node width about equal to length in dorsal view .... ***M. conicara* Xu, 1998**
- Scapes shorter, not reaching posterior head margin when laid back in full-face view. Petiolar sternum convex posterior to anteroventral tooth in profile view. Petiolar node broader than long in dorsal view .... ***M. hania* Xu & Liu, 2011**

27 Median clypeal lobe apical margin medially notched. Anterior mesonotal margin raised well above posterior margin. Propodeal dorsum strongly convex in profile view **28**
- Median clypeal lobe apical margin linear to weakly convex. Anterior mesonotal margin not or barely raised above posterior margin. Propodeal dorsum more-or-less linear in profile view... **29**

28 Notch of median clypeal lobe apical margin shallow. Median clypeal lobe shorter, broader, and tapering to apex … ***M. gigas* Willey & Brown, 1983**
- Notch of median clypeal lobe deep. Median clypeal lobe longer, narrower, with sides subparallel .... ***M. loriai* Emery, 1897**

29 Median clypeal lobe very short; lateral margins parallel. China …... ***M. luoba* Xu & Liu, 2011**
- Median clypeal lobe longer; lateral margins parallel to weakly diverging apically. New Guinea or Australia ....… **30**

30 Petiolar node lateral margins sublinear, conspicuously diverging posteriorly in dorsal view. Posteroventral angle of subpetiolar process acute, sharp. New Guinea ….... ***M. ruthae* Willey & Brown, 1983**
- Petiolar node lateral margins convex, subparallel to weakly diverging posteriorly in dorsal view. Posteroventral angle of subpetiolar process obtuse, weakly rounded. Australia … ***M. densesticta* Willey & Brown, 1983**

31 Median clypeal lobe tridentate, with apicomedial process in addition to apicolateral corners (Fig 8F) ....… **32**

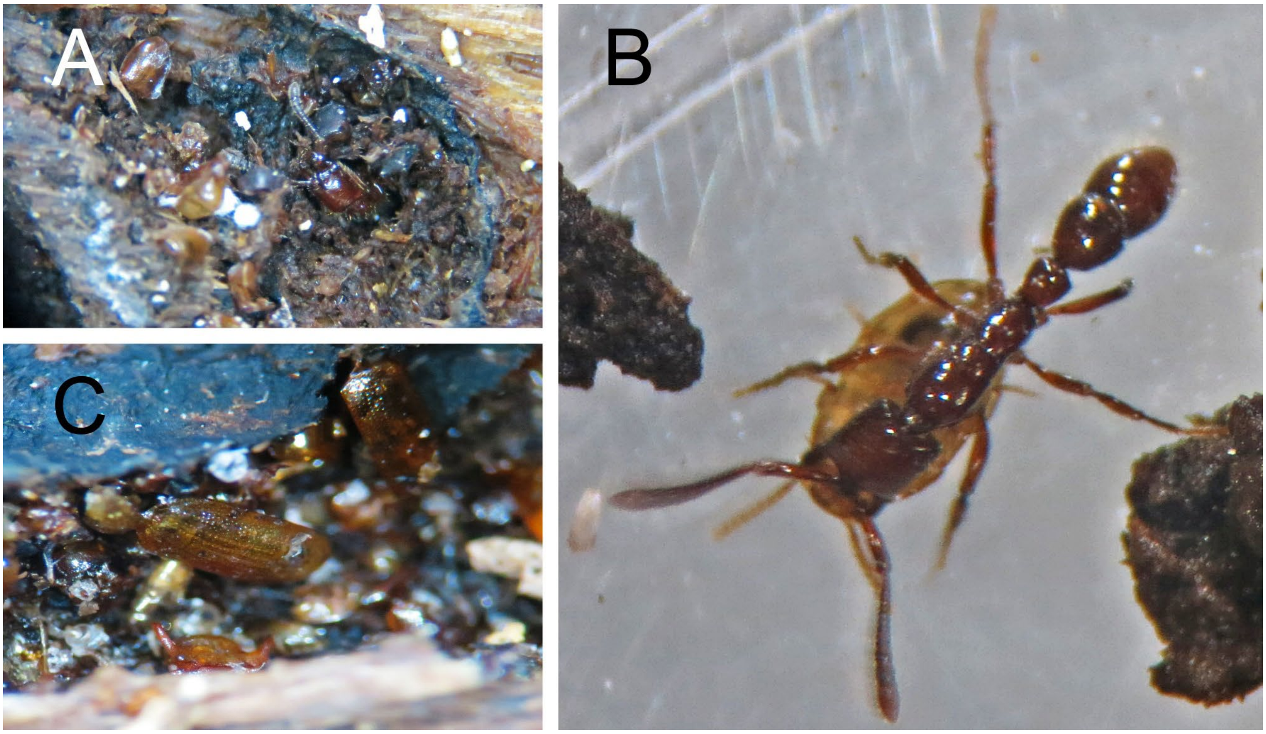

Fig 6. Photographs of live *Myopias darioi*. **A.** Type colony nest entrance with worker and midden. **B.** Paratype worker attacking tenebrionid beetle in lab setting. **C.** Detail of prey remains inside nest.

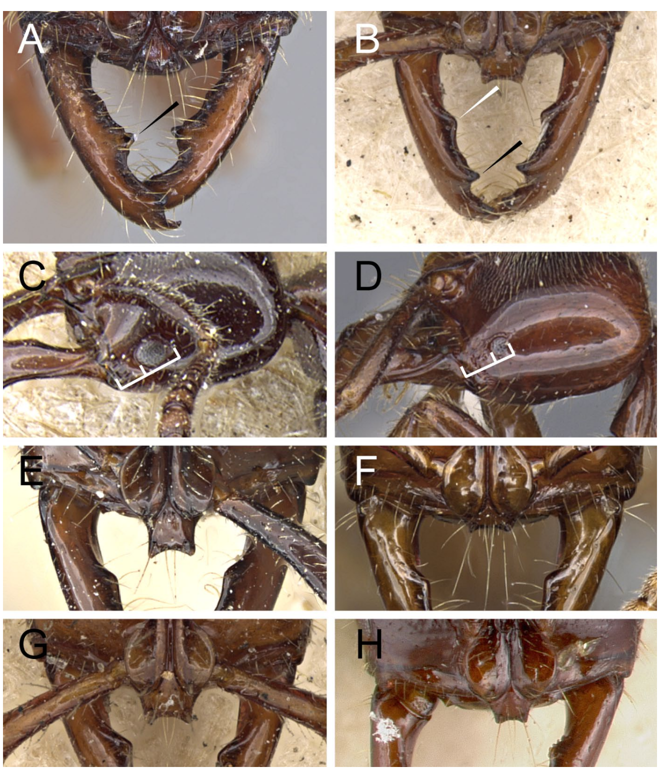

Fig 7. Head capsules of *Myopias* species; A, B, E–H full-face view; C, D profile view, maximizing compound eye length. **A.** *M. concava* (CASENT090253, W. Ericson), black wedge indicates prebasal tooth. **B.** *M. mayri* (CASENT090134, W. Ericson), black wedge indicates prebasal tooth; white wedge indicates basal angle. **C.** *M. castaneicola* (CASENT090252, W. Ericson). **D.** *M. bidens* (CASENT090392, Z. Lieberman). **E.** *M. bidens* (CASENT090392, Z. Lieberman). **F.** *M. breviloba* (CASENT028190, S. Hartman). **G.** *M. mayri* (CASENT028190, S. Hartman). **H.** *M. trumani* (CASTYPE06990, A. Nobile).

- Median clypeal lobe bidentate, without apicomedial process in addition to apicolateral corners …................................. **33**

32 Apicomedial process of median clypeal lobe produced anteriorly. Basal blade of mandibular masticatory margin weakly produced medially … ***M. modiglianii* (Emery, 1900)** [note: placement based on description in Crawley (1924)]
- Apicomedial process of median clypeal lobe not produced anteriorly. Basal blade of mandibular masticatory margin conspicuously produced medially .... ***M. mandibularis* (Crawley, 1924)**

33 Basal angle of mandibular masticatory margin dentate (Fig 8G). Mandibles very broadly triangular in full-face view … ***M. delta* Willey & Brown, 1983**
- Basal angle of mandibular masticatory margin edentate (Fig 8H). Mandibles less broadly triangular in full-face view **34**

34 Basal angle of mandible distinct. Median clypeal lobe length and width subequal. China .... ***M. daia* Xu, Burwell & Nakamura, 2014**
- Basal angle of mandible indistinct, rounded. Median clypeal lobe broader than long. Australia .... ***M. tasmaniensis* Wheeler, 1923**

Discussion

The genus *Myopias* occurs in most of the Oriental, Indo-Australian, and Australasian regions, ranging from northern India (Jammu & Kashmir state) to Tasmania in Australia (Fig 9). The genus is particularly diverse in New

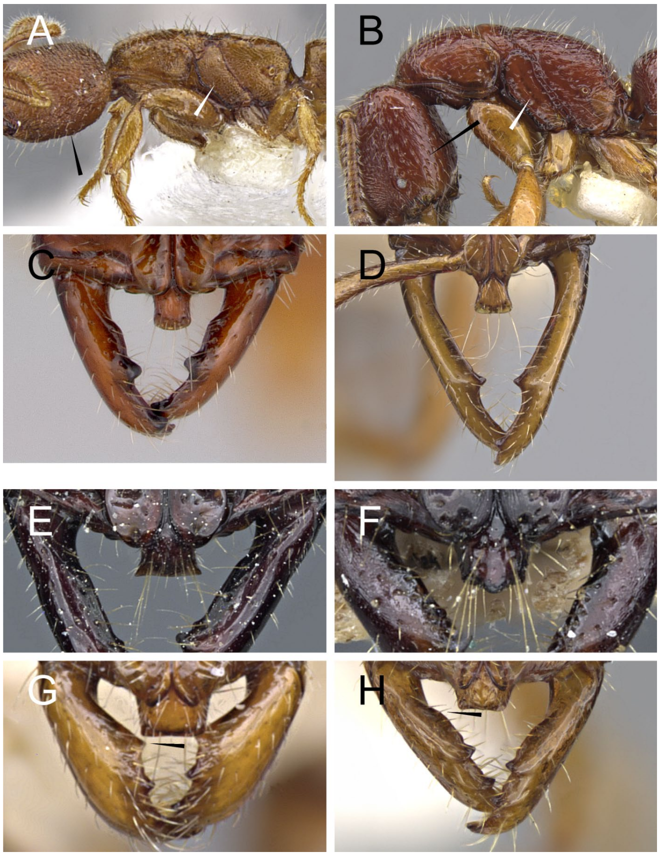

Fig 8. A and B, head and mesosoma profile view; C–H head capsule full-face view. **A.** *M.* Bill Brown morphospecies "blanadelphe" (CASENT090252, W. Ericson). **B.** *M. densesticta* (CASENT090252, W. Ericson). **C.** *M. chapmani* (CASENT017209, A. Nobile). **D.** *M. julivora* (CASENT090253, W. Ericson). **E.** *M. maligna punctigera* (CASENT090392, Z. Lieberman). **F.** *M. modiglianii* (CASENT090392, Z. Lieberman). **G.** *M. delta* (CASENT090252, W. Ericson). **H.** *M. tasmaniensis* (CASENT027059, R. Perry).

Guinea (17 described species) and some Indonesian islands (Sumatra, 9 species) with some species known only from the Mentawei islands (*M. maligna punctigera* and *M. papua*). The updated distributional records of *Myopias* (Fig 9) show that this genus is much more widespread than previously thought (Ogata, 1992), in particular for continental Asia and the Indian sub-continent, the western part of Australia, or the Solomon Islands. However, much work on this genus remains to be done before a complete picture is attained of its distribution and diversity within different regions as illustrated by the lack of records of *Myopias* in several countries (Cambodia, Laos, Vietnam) or Chinese provinces (Guangdong, Guangxi, Hainan) where it might possibly occur. A recent review of Ponerinae of Vietnam did not mention any collection of the genus, but *Myopias* still figured as a potential genus to be found in the generic key provided therein (Eguchi et al., 2014). More species are also in need of description as shown by the four *Myopias* morphospecies recorded from the Solomon Islands (Sarnat et al., 2013) or from other regions (see Supplement).

The colony containing the type series of *M. darioi* **sp. nov.** was nesting inside a fallen, dead trunk, circa 10 meters length, in an advanced stage of decomposition. The nest contained two dealate gynes, 35 workers of which four were undoubtedly callow, four males, and brood of all stages, with pupae predominating (48 pupae, of which two were male and two were gyne pupae). The trunk was completely damp. In some parts, there was water filling the cavities. The trunk was occupied by a high density of nesting ants, *e.g.*, *Myrmecina* sp., *Odontomachus rixosus* Smith, 1857, *Pheidole* spp., *Ponera* sp. dealate gyne, *Pseudoneoponera* sp., *Tetramorium* sp., representatives of various beetle families, and a Malaysian forest scorpion, *Heterometrus spinifer* (Ehrenberg, 1828). The *Myopias* colony was in the trunk portion next to the soil with harder bark than the surrounding structure. The nest was 15 cm long and approximately 9 cm in diameter, with 3 cavities. Workers and brood were scattered through two of the chambers. One large chamber was the "kitchen dump" replete with beetle remains of various families (Fig 6A), represented by head capsules, mandibles, elytra, and pronota (Fig 6C). Additional galleries leading away from the midden contained further beetle remains. Also found were ant remains, including two head capsules, three fourth abdominal segments (two of them attached with postpetiole) and two petioles of a *Proceratium* species; and one *Gnamptogenys* mesosoma with attached mesocoxae, metacoxae, and petiole. All nest remains are deposited in MZSP Collection (*R. S. Probst #352*). Finally, there were tiny cotton-like balls resembling fungus which workers were removing from the nest. It is unknown whether *M. darioi* build new nests or co-opt pre-existing cavities, although some observations were made of workers excavating a nest entrance.

Based on the consumed remains retrieved inside the nest and the galleries leading out of the nest, beetles and other potential prey were gathered by RSP inside the trunk one day after collection of the colony. In the Maliau Basin Studies Center laboratory mixed sets of arthropods were offered in a Petri Dish to the ants in three "cafeteria experiments", in which the ants were allowed to choose prey from a variety available in the field: Adult ants (workers of *Cerapachys* and of a small *Leptogenys* species), isopods, millipedes (three species), geophilomorph centipedes, entomobryomorph collembolans, cricket (Gryllidae) nymphs, termite workers (*Nasutitermes* sp.), cucujoid and tenebrionid beetle larvae and adults. The ants readily accepted adult beetles from two tenebrionid species (a *Platydema* spp. [Diaperini] and a *Micropeneta* spp. [Gnathidiini]) (https://vimeo.com/probstrodolfo/myopias-darioi-sp-n-predatory-behavior). Apparently, the clypeal lobe assists the attachment of the ant to the promesonotal articulation of the beetle's pronotum, allowing the ant to hold the prey and sting it; the other organisms were consistently ignored. This stands in contrast to the other known prey preferences of *Myopias* (Table 1). The origin of the ant remains inside the nest is unknown; these may have been scavenged, preyed upon, or existed in the nest prior to use by *M. darioi*.

Ponerine ants are known to prey on a substantial range of organisms (Pfeiffer *et al.* 2014), with the diversity

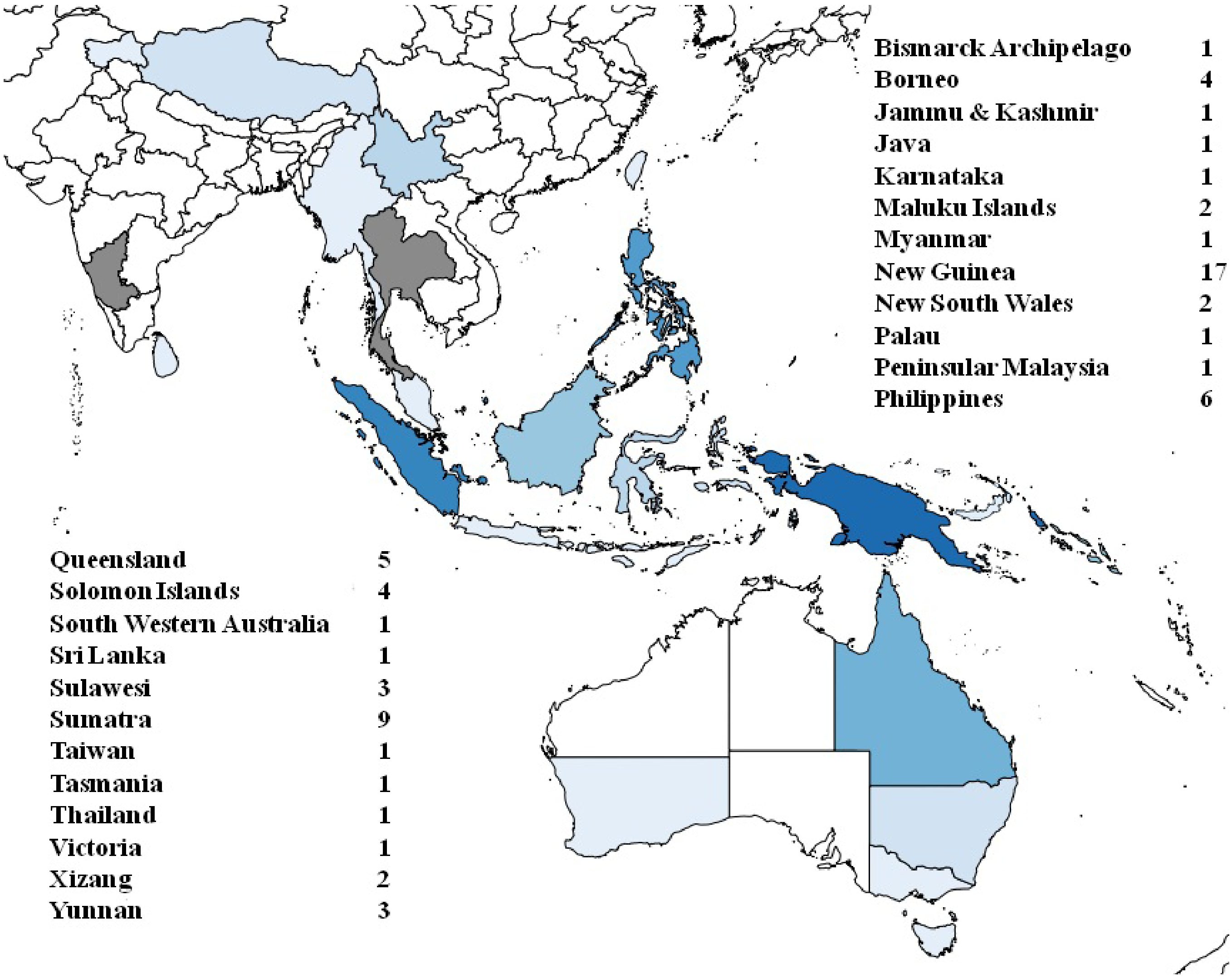

Fig 9. Known distribution and species diversity of *Myopias* in the Australasian and Indomalayan regions. Species richness is represented along an increasing gradient of blue (lighter blue = low richness; darker blue = high richness). Known species counts are presented for each region. Gray indicates regions for which the genus is known only from morphospecies and where no precise species counts are possible.

of mandibular and dentitional morphology correlated to hunting strategies (Schmidt & Shattuck, 2014). The head capsules of *Myopias* species are similar in appearance to those of the African millipede-specialist genus *Plectroctena*, an observation reflected in the historical classification of the two genera (plus *Myopias*' junior synonym *Trapeziopelta*) in the former subtribe "Plectroctenini" in Emery's (1911) contribution to the *Genera Insectorum* series. These similarities include minute to absent eyes, enlarged frontal lobes, long curved mandibles, and presence of a midclypeal lobe (although absent in some *Myopias* species); these characters are associated with the capture of hard and round prey (Déjean et al., 2001). It has been hypothesized that the clubbed antennae of cryptobiotic ponerines could aid in prey detection and movement in low light conditions or in narrow cavities (Schmidt & Shattuck, 2014). Despite the similarity of the head capsule of *Myopias* with *Plectroctena*, it is apparent that *Myopias* has a relatively catholic diet.

Few ponerines are known to prey on adult beetles, making the observed preference of *M. darioi* for beetles much more notable. Prior records of preferential predation on beetles include tenebrionid specialists, the South African *Streblognathus* (Brown 2000), and a species of *Platythyrea* (*P. arnoldi*; Arnold, 1915). Beetles offered to *M. darioi* workers in the present study were rapidly detected and were seized dorsally and stung ventrally. Prey were transported between the workers' legs with the prey's venter facing upward parallel to the ant's body axis (Fig 6B), preventing the beetle from clinging to the ground. This manner of prey carriage resembles that observed in Dorylinae (Déjean et al., 1999; Gotwald 1995; Schatz et al., 2001). Given the disinclination of other ground-dwelling ants to hunt adult beetles in similar environments, the preference of *M. darioi* for beetles may represent a case of competitive release. *Myopias*, with its considerable diversity of mandibular form, may be a model group with which to study the ecology and evolution of prey choice in a comparative framework.

Probably due to cryptic behavior, almost all information about *Myopias* natural history comes from circumstantial observations (Schmidt & Shattuck, 2014). Ecological information on *Myopias* species is thus scarce and scattered within the literature. Colonies are relatively small, with less than a hundred workers, and occur in rotten logs in rainforests or in the soil next to rocks in sclerophyll woodlands (Billen et al., 2013). Gyne number observed in collected nests varies and some species could be considered as polygynous (*e.g.*, *M. chapmani*, *M. concava, M. emeryi, M. maligna*) (Willey & Brown, 1983; Billen et al., 2013) although formal investigation of functional polygyny is still necessary at this point. Wheeler (1923) argued that the highly vestigial eyes in the workers of these ants could indicate subterranean habits. In his study of the New Guinea ant communities, Wilson (1959) included *Myopias* species (n=6) as ground-stratum nesters, allocating them to the category of "residents of small pieces of rotting wood", but it should be noted that some species are known as subterranean nesters (Wheeler, 1923; Willey & Brown, 1983). Wilson (op. cit.) also presented reasons why this microhabitat is favored by ants; for example, pieces of wood tend to maintain uniform and favorable conditions of temperature and humidity. In the Lower Basu River of the Huon Peninsula, New Guinea, Wilson (1976) found that *Myopias* together with genera *Odontomachus*, *Leptogenys, Cerapachys* Smith*, Myrmecina* Curtis, *Cardiocondyla* Emery, *Pristomyrmex* Mayr*, Triglyphothrix* (= *Tetramorium*) Forel, and *Leptomyrmex* Mayr, constitute 10–15% of all colonies found in what he called the ground zone, which includes soil nesters (ants nesting exclusively or extending their nests from the soil into rotting logs) plus residents of small pieces of wood.

Little is known about the feeding habits of *Myopias*, but some species are considered specialist predators of millipedes (Schmidt & Shattuck, 2014). Wilson (1959) classified two New Guinea species of *Myopias* (possibly *M. concava* and *M. julivora*) as millipede predators and estimated colony sizes as 60 and 40-70 workers, respectively. Wilson generalized that specialist predators tend to have the smallest colonies as a function of diversity and local abundance of food supply. Billen

Table 1. Summary of biological information of *Myopias* species. Structure column: M - monogyny, P - polygyny. "?" symbols means uncertain information.

Species *(reference #, see end of table)*	**Known distribution**	**Colony size/ structure**	**Feeding habits**
Myopias amblyops (Roger, 1861)	Myanmar, Sri Lanka	- / -	-
Myopias bidens (Emery, 1900)	Indonesia (Sumatra), Philippines	- / -	-
Myopias bidens polita (Stitz, 1925)	Philippines	- / -	-
Myopias breviloba (Wheeler, 1919)	Borneo, Indonesia (Krakatau Islands), Philippines	- / -	-
Myopias castaneicola (Donisthorpe, 1938)	New Guinea	- / -	-
Myopias chapmani Willey & Brown, 1983 (2)	Australia (NSW, QLD)	20-30/P	-
Myopias concava Willey & Brown, 1983 (3)	New Guinea	50-60/M-P	Millipede
Myopias conicara Xu, 1998	China (Yunnan)	- / -	-
Myopias crawleyi (Donisthorpe, 1941)	Indonesia (Sulawesi, Sumatra)	- / -	-
Myopias cribriceps Emery, 1901	New Guinea	- / -	-
Myopias daia Xu, Burnwell & Nakamura, 2014	China (Yunnan)	- / -	-
Myopias darioi sp. n. (4)	Borneo	40 /P	Beetle specialist?
Myopias delta Willey & Brown, 1983 (2)	Australia (QLD), New Guinea & Bismarck Archipelago,	±30/M	Ant specialist
Myopias densesticta Willey & Brown, 1983	Australia (QLD)	- / -	-
Myopias emeryi (Forel, 1913) (1)	Indonesia (Java, Sumatra)	- / P	Millipede
Myopias gigas Willey & Brown, 1983 (2)	New Guinea	- / -	Millipede?
Myopias hania Xu & Liu, 2011	China (Yunnan)	- / -	-
Myopias hollandi (Forel, 1901)	Indonesia (Sumatra)	- / -	-
Myopias julivora Willey & Brown, 1983 *(2)*	New Guinea	30-75/M	Millipede
Myopias kuehni (Forel, 1902)	Indonesia (Maluku Islands)	- / -	-
Myopias latinoda (Emery, 1897)	New Guinea & Shouten island	- / -	-
Myopias levigata (Emery, 1901)	New Guinea	- / -	-

Table 1. Summary of biological information of *Myopias* species. Structure column: M - monogyny, P - polygyny. "?" symbols means uncertain information. (Continuation)

Species *(reference #, see end of table)*	**Known distribution**	**Colony size/ structure**	**Feeding habits**
Myopias lobosa Willey & Brown, 1983	Philippines	- / -	-
Myopias loriai (Emery, 1897)	New Guinea	- / -	-
Myopias luoba Xu & Liu, 2011	China (Xizang)	- / -	-
Myopias maligna (Smith, 1861) (1)	Borneo, Indonesia (Maluku islands, Sulawesi), Peninsular Malaysia,	- / M	Millipede
Myopias maligna punctigera (Emery, 1900)	Indonesia (Mentawai islands), New Guinea	- / -	-
Myopias mandibularis (Crawley, 1924)	Indonesia (Sumatra)	- / -	-
Myopias mayri (Donisthorpe, 1932)	Indonesia (Sulawesi)	- / -	-
Myopias media Willey & Brown, 1983	New Guinea	- / -	-
Myopias menba Xu & Liu, 2011	China (Xizang)	- / -	-
Myopias modiglianii (Emery, 1900)	Borneo, Indonesia (Sumatra), Philippines	- / -	-
Myopias nops Willey & Brown, 1983	Taiwan	- / -	-
Myopias papua Snelling, 2008	Indonesia (Mentawai Islands), New Guinea	- / -	-
Myopias philippinensis (Menozzi, 1925)	Philippines	- / -	-
Myopias ruthae Willey & Brown, 1983	New Guinea	- / -	-
Myopias santschii (Viehmeyer, 1914)	New Guinea	- / -	-
Myopias shivalikensis Bharti & Wachkoo, 2012	India (Jammu & Kashmir)	- / -	-
Myopias tasmaniensis Wheeler. 1923	Australia (NSW, QLD, WA (south), TAS, VIC)	- / -	-
Myopias tenuis (Emery, 1900) (2)	Australia (QLD), New Guinea, Raja Ampat Islands	±15/M-P	Entomobryid collembola
Myopias trumani (Donisthorpe, 1949)	New Guinea	- / -	-
Myopias xiphias (Emery, 1900)	New Guinea	- / -	-

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2- Willey, R.B. & Brown, W.L., Jr. (1983). New species of the ant genus *Myopias* (Hymenoptera: Formicidae: Ponerinae). *Psyche*, 90: 249–285.
3- Wilson, E.O. (1955). A monographic revision of the ant genus *Lasius*. *Bulletin of the Museum of Comparative Zoology*, 113: 1–199.
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et al. (2013) studied *Myopias emeryi*, *Myopias maligna*, and "*M.* sp.1", all species from Padang, Indonesia, and Ulu Gombak, Malaysia, and classified them as millipede predators, although the authors didn't give any information on feeding habits or nest remains of these species. In their revision of *Myopias*, Willey and Brown (1983) gave some information on the behavior of these ants. They suggested that *M. gigas* could be a millipede predator, based on the long mandibles and large size. Two nests of *M. julivora* were found with remains of millipedes in the brood chamber and nest galleries; the prey all seemed to belong to the same group. For *M. concava*, the authors mentioned that one colony inside bark contained an unidentified insect larva and a live adult beetle, possibly a cucujoid. Unfortunately, the residue from Wilson's collection was lost. Regarding *M. tenuis*, the most common and widespread species (see Table 1), a worker carrying an entomobryid collembolan and a nest having cuticular fragments of an unidentified arthropod are mentioned by Willey and Brown (1983). *Myopias delta* is reported as a specialist predator of ants and according to Willey and Brown (1983), Wilson's notes mentioned a colony with a small decapitated worker of a *Leptogenys* species and the remains of at least two myrmicine genera. Again, those food remains were lost in transit. Recruitment to collect food resources has never been reported to the best of our knowledge, but has been hypothesized for *M. emeryi* and *M. maligna* based on the presence of subepithelial glands, which are associated with recruitment in ants (Gobin et al., 2003), and on trail-following behavior observed in *M. maligna* and an undescribed species (Billen et al., 2013).

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Supplementary material:
http://periodicos.uefs.br/ojs/index.php/sociobiology/rt/suppFiles/723/0
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