The Asian Needle Ant, *Brachyponera chinensis* (Hymenoptera: Formicidae) in the USA: Identification, Biology, and Distribution

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Introduction

According to (Antweb 2025) there are 23 recognized species (plus five subspecies) of *Brachyponera* (Hymenoptera: Formicidae: Ponerinae) worldwide. Most species are found in Africa, Asia, and Australia with the highest species diversity found in southeastern Asia. *Brachyponera chinensis* Emery, native to Asia, is the only species reported from the United States at present.

Brachyponera chinensis (Figs. 1-6), the Asian needle ant (ANA), is small, blackish colored stinging species native to Japan. It was first detected in the United States in Dekalb County, Georgia in 1932 (Smith, 1934). Since then, populations have spread along the east coast and into other regions of the USA. It was referred to as *Pachycondyla chinensis* in the literature until Schmidt and Shattuck (2014) revived it from synonymy. Asian needle ants are invasive species in the USA that establish large populations that may displace native species.

Diagnosis

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Workers of *B. chinensis* can be recognized by their shiny, dark blackish appearance, head being slightly longer than wide, average sized eyes located near the mandibles, simple filiform antennae (lacking a club) with 12 antennomeres, large mandibles, lack of spines or other ornamentation, a single raised petiolar node, and a sting. However, most people do not have microscopes to view these characteristics and most encounters are outdoors. Key features that may help with quick identification in the field include the relatively small size of the workers (about the size of an average fire ant) with workers all about the same size; shiny and blackish appearance; slow moving and not aggressive; nests typically in rotting wood, at tree bases, or under mulch/leaf litter (not in mounds); and established populations often extremely large. Another characteristic is that workers do not form foraging trails as is common in many other species, but instead perform "tandem carrying," a behavior in which individual workers carry other workers to food sources. Asian needle ants are unlikely to enter homes and do not nest in open areas as do fire ants. Nests are often in natural wooded habitats or in urban areas at edges of yards, in mulch under trees, and occasionally in flowerpots.

Common Misidentifications

The Mississippi Entomological Museum receives regular inquiries from the public about whether or not they have Asian needle ants. Inquiries are typically accompanied by cell phone photos and occasionally physical specimens. A large percentage of Asian needle ant identification requests end up being other species of ants, especially several common urban ants, but also occasionally small wasps or bees. A few common misidentifications include small species of carpenter ants (Formicidae, *Camponotus* spp.), odorous house ants (Dolichoderinae, *Tapinoma sessile*), Argentine ants (Dolichoderinae, *Linepithema humile*), acrobat ants (Myrmicinae,

Crematogaster spp.), various species in the subfamily Myrmicinae, especially imported fire ants (*Solenopsis* spp.), and numerous species in the subfamily Ponerinae. Members of the subfamily Formicinae differ from ANA by lacking a sting. Among the Formicinae, smaller, dark-colored species of carpenter ants are sometimes confused with ANA, but differ by being larger, having a wider head, eyes located higher on the head, mesosoma fused and convex, (in profile view), lacking a sting, and exhibiting trailing behavior. Similar to Formicinae, Dolichoderinae ants lack a sting. Workers of odorous house ants and Argentine ants, which are often mistaken for ANA, are slightly smaller, have a less prominent petiolar node, lack a sting, and form trails. Species in the subfamily Myrmicinae, many of which possess a sting, are easily differentiated from ANA by having a two-segmented waist. Workers of imported fire ants (*Solenopsis invicta, S. richteri*, and *S. invicta* X *richteri*) are commonly confused by homeowners, but are typically bicolored, vary in size, have ten antennomeres of which the apical two form a large club, usually nest in large mounds in open disturbed areas, and are aggressive when disturbed with workers attacking and stinging readily.

Asian needle ants are most similar to other genera in the same subfamily, Ponerinae, which includes nine genera in the USA: *Brachyponera, Cryptopone, Hypoponera, Leptogenys, Neoponera, Pachycondyla, Platythyrea, Ponera,* and *Pseudoponera*. However, most of these genera as unlikely to be encountered by the average person or they are restricted to certain areas of the country. In general, *B. chinensis* can be separated from these genera by the promesonotum being distinctly set off from the propodeum, by the shiny mesopleura, the high tapering petiolar node, and their large super colonial nesting behavior.

Biology and Economic Importance

Brachyponera chinensis typically nests in soil in somewhat damp areas, especially below stones, in rotting logs and stumps, or other debris. In urban settings nests may also be found under mulch, railroad ties, bricks and pavers. Colony size ranges from less than 100 individuals to several thousand, and multiple queens may be present. Unlike many invasive ant species, *B. chinensis* often nests in natural wooded habitats. This species appears to prefer termites as a food source but also feeds on other organisms.

The Asian needle ant has been shown to negatively impact biodiversity and poses medical risks for humans from anaphalaxis as a result of stings (Nelder et al. 2006). Workers and queens are not aggressive, but workers may sting if handled and alate queens may sting after landing on individuals and becoming trapped between clothing layers and skin. Reactions in humans from the sting of Asian needle ants range from mild to severe, sometimes with long lasting symptoms (Nelder *et al,* 2006). Consequently, *B. chinensis* poses an emerging health threat throughout its range, as well as areas to where it may be spreading.

Distribution

Native Range: Asia, probably China or Japan.

U.S. Distribution: AL, AR, CN, FL, GA, KY, MS, NC, NY, SC, TN, TX, VA, WA, WI.

(antweb.org, antwiki.org, MEM, Dunn and Menninger 2013, Guenard, 2009; Guénard and Dunn 2010, MacGown 2009, and Nelder *et al,* 2006).

Identification of Asian Needle Ants in the Field

Workers are small, blackish, shiny, have a single raised node at waist, are slow moving, and not aggressive. Queens are similar in appearance to workers but larger, with an enlarged mesosoma, and with wings (lost after mating). Flight periods are from March to September, but with higher activity in the summer. Males are yellowish brown, with wings, and no sting.

- Don't form foraging trails or columns; instead, workers carry other workers to food sources (tandem carrying).
- Nests are in rotting wood, in tree crotches, in and under leaf litter, mulch, pine straw, potted plants, and similar places.

Key Features of Worker (Fig. 1–2)

- Small (TL ≈ 4.0-5.0 mm or 1/5 of an inch).
- Head, body, & antennal scape blackish; legs, mandibles, & remaining antennomeres reddish brown.
- Entire body, except mesopleura with fine, pale pubescence that does not obscure integument; overall with a shiny appearance. Longer, erect, pale setae scattered on body, especially head and gaster.
- Head slightly longer than wide; eyes large, located near mandibles; ocelli absent; mandibles large, reddish, with 8–10 teeth, apical tooth enlarged; frontal carina covers antennal bases; antenna filiform, with 12 antennomeres; scape elongate, length extends slightly beyond posterior border of head.
- Promesonotum convex in lateral view, elevated above propodeum, propodeal declivity angled 120°–130°, propodeum lacking adornment such as spines.

- Waist with a single node, wider at base, rounded dorsally (in lateral view), subpetiolar process present with posteriorly directed projection.
- Sting present and obvious at tip of gaster.
- Mid tibia with two spurs, both weakly pectinate, one larger (≈ 0.18 mm) and the other smaller (≈ 0.1 mm); hind tibial spur large (≈ 0.3 mm), pectinate (comb-like)along the entire inner curved edge.

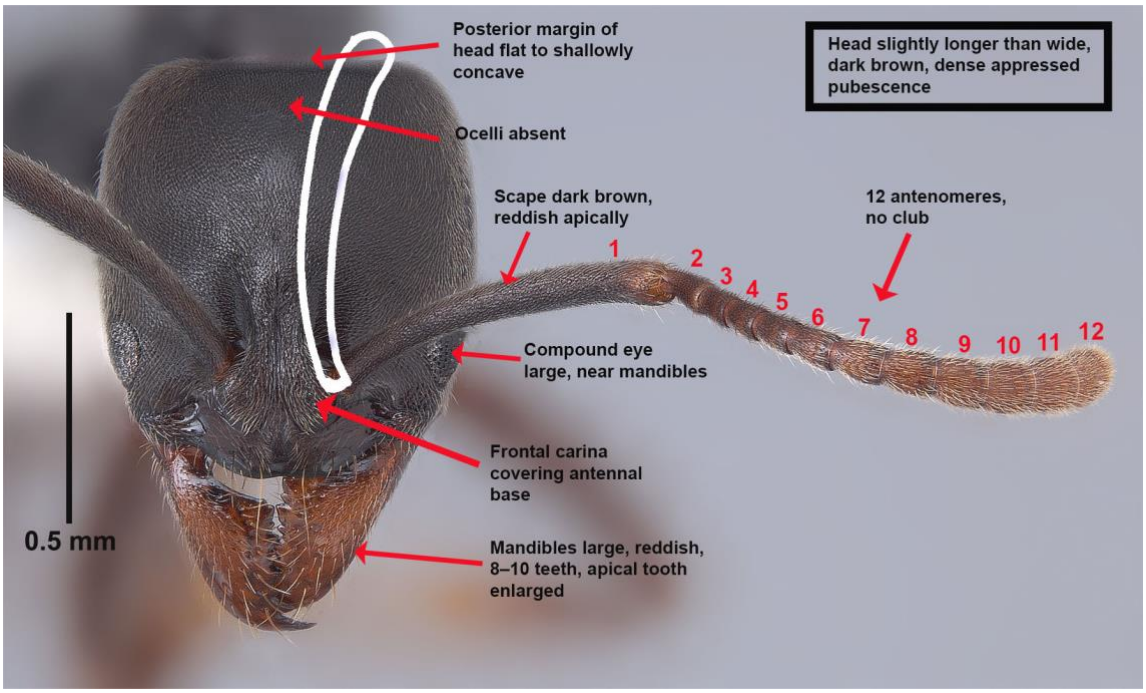

Figure 1. Full face view of *Brachyponera chinensis* worker showing key characteristics. The white outline shows the scape slightly overlapping the posterior border of the head.

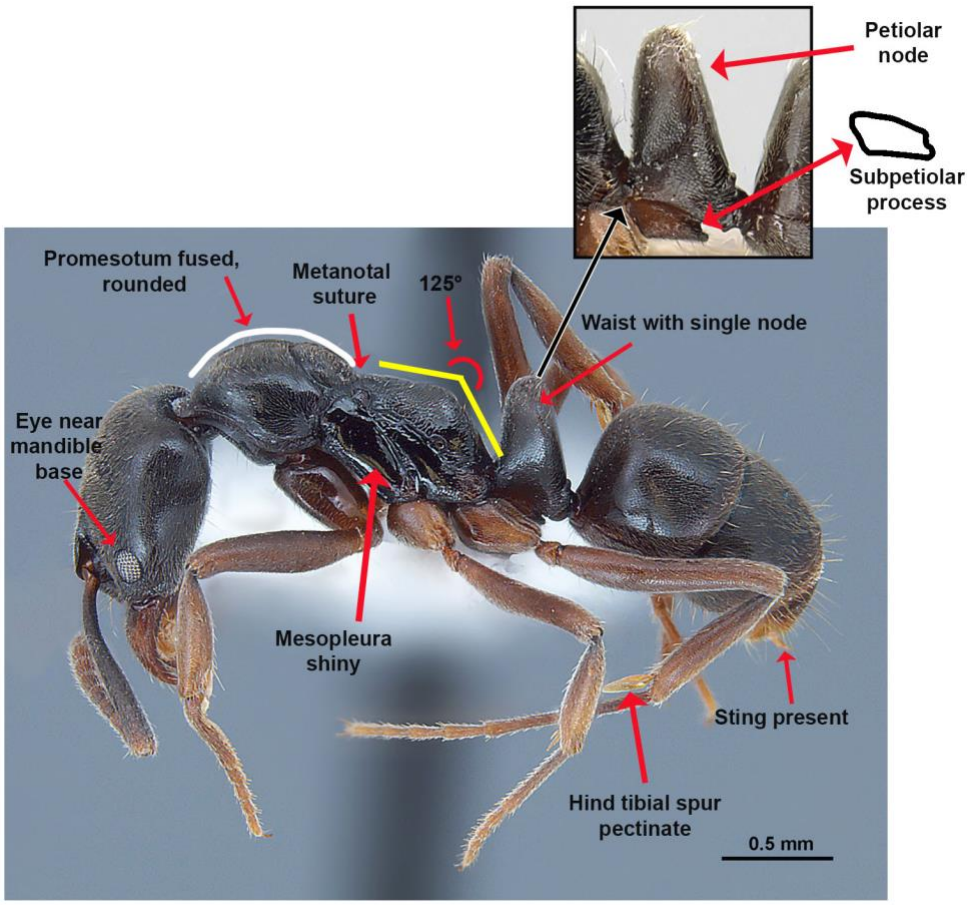

Figure 2. Lateral view of *Brachyponera chinensis* worker showing key characteristics.

Key Features of Queen (Figs. 3–4)

- Medium sized, slightly larger than worker (TL ≈ 5.0–6.0 mm).
- Head, body, & antennal scape brownish black; legs & remaining antennomeres reddish brown.
- Entire body, except mesopleura with fine, pale pubescence that does not obscure integument, appearing shiny. Longer, erect, pale setae scattered on body, especially head and gaster. Fine sculpture on pronotum, mesoscutum, petiole; stronger sculpture (irregular striae) on propodeum; and mesopleura lacking sculpture except at edges.

- Head longer than wide; eyes large, near mandibles; three ocelli present; mandibles large, reddish, with 8–10 teeth, apical tooth enlarged; frontal carina covers antennal bases; antenna filiform, with 12 antennomeres; scape elongate, length extends slightly beyond posterior border of head.
- Mesosoma continuous, convex in lateral view, propodeal declivity sharply angled about 125°, propodeum lacking adornment such as spines.
- Wings scars or wings present (unmated queens). Forewing with brown stigma, two submarginal cells, and discal cell present.
- Waist with a single node, wider at base, tapering apically, rounded dorsally (in lateral view), subpetiolar process present with posteriorly directed projection.
- Sting present and obvious at tip of gaster.

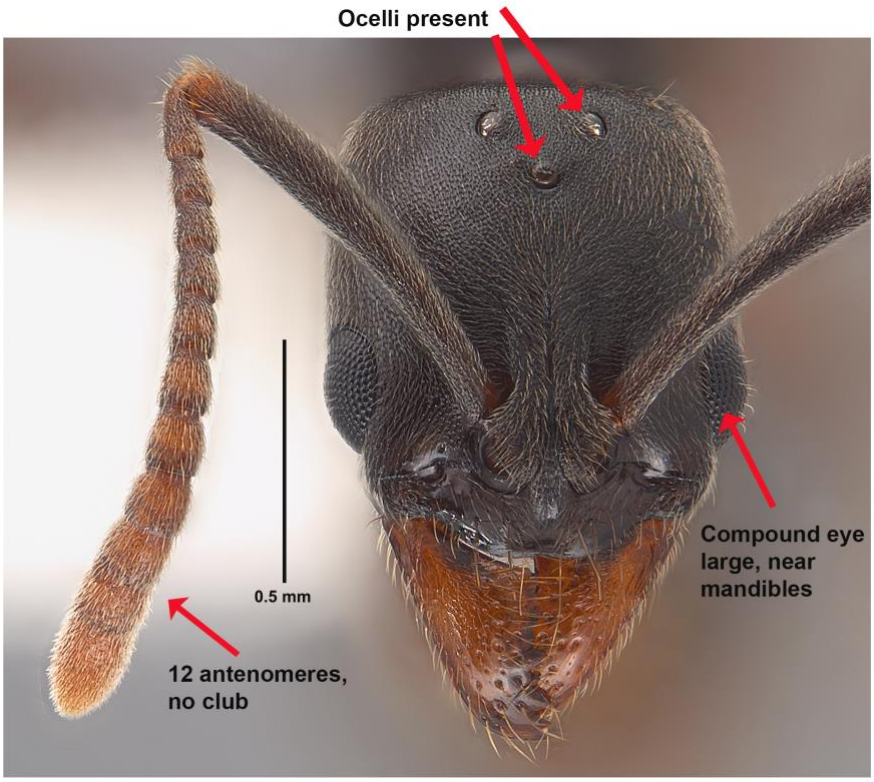

Figure 3. Full face view of *Brachyponera chinensis* queen.

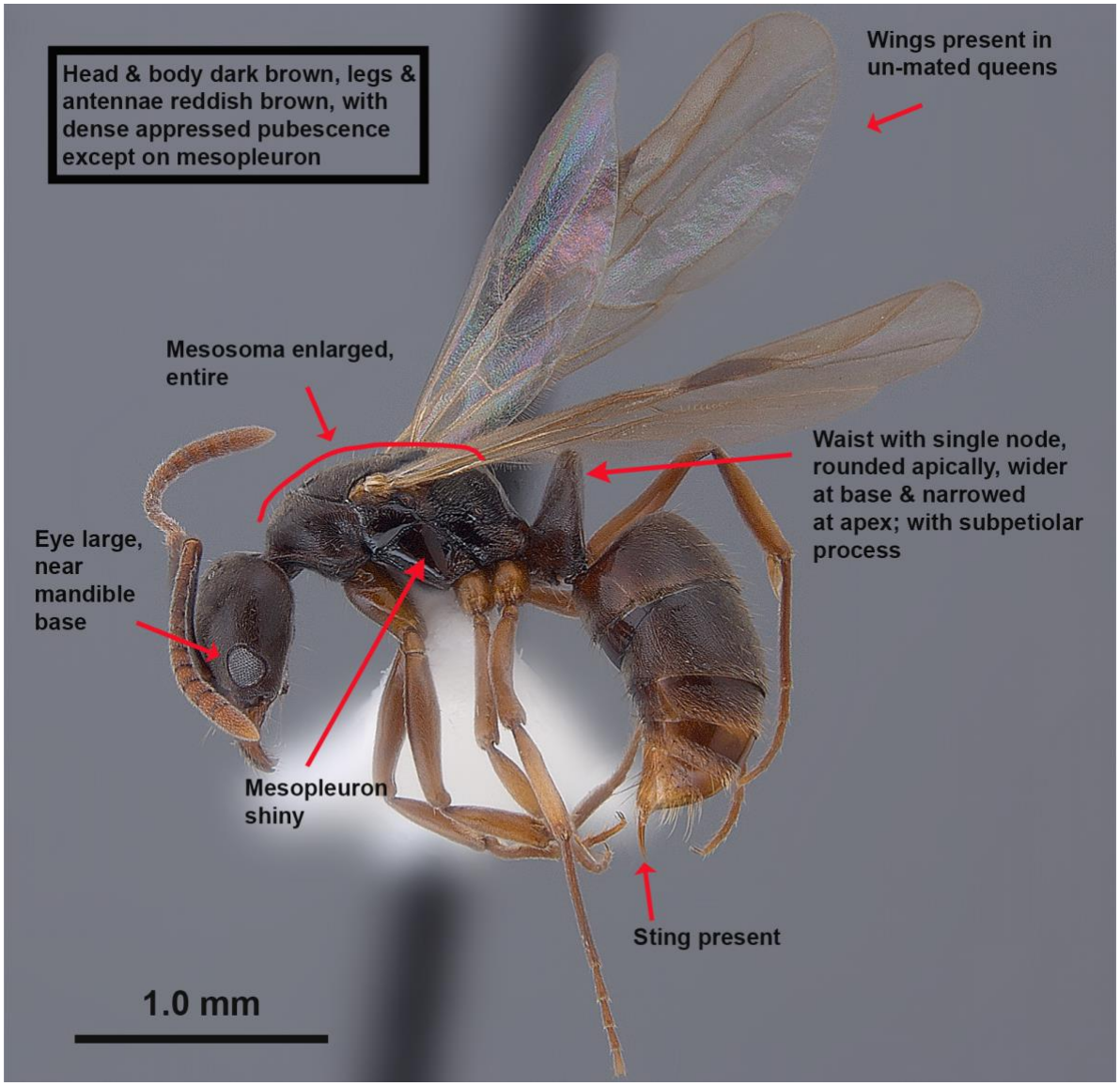

Figure 4. Lateral view of *Brachyponera chinensis* queen, alate, showing key characteristics.

Key Features of Male (Figs. 5–6)

- Small, slightly smaller than worker (TL ≈ 3.5–4.0 mm).
- Head, scape, pedicel, pronotum, mesopleuron, & posterior portion of gaster yellowish brown; flagellomeres, propodeum, waist, & anterior portion of gaster dark brown;

mesoscutum & legs pale whitish yellow. Body shiny with sculpture mostly found on propodeum.

- Pubescence less dense than on worker and queen; does not obscure integument, appearing shiny. Longer, erect, pale setae scattered on body, especially head and gaster. Propodeum with strong sculpture; light sculpture elsewhere except mesopleura which lacks sculpture except at suture.
- Head about as long as wide; eyes extremely large, about half as long as head length, near mandibles; three large, ocelli present; mandibles reduced, teeth absent; frontal carina not covering antennal bases; antennae filiform with 13 antennomeres, scape short.
- Mesosoma continuous, convex in lateral view, propodeal declivity sharply angled, about 125°, propodeum lacking adornment such as spines.
- Wings present. Forewing with brown stigma, two submarginal cells, and discal cell present.
- Waist with a single node, short, thickened, wider at base, rounded dorsally (in lateral view), subpetiolar process present with posteriorly directed projection.
- Sting absent; paramere somewhat trapezoidal; thin curved, posteriorly directed spine present at gastral apex on dorsum.

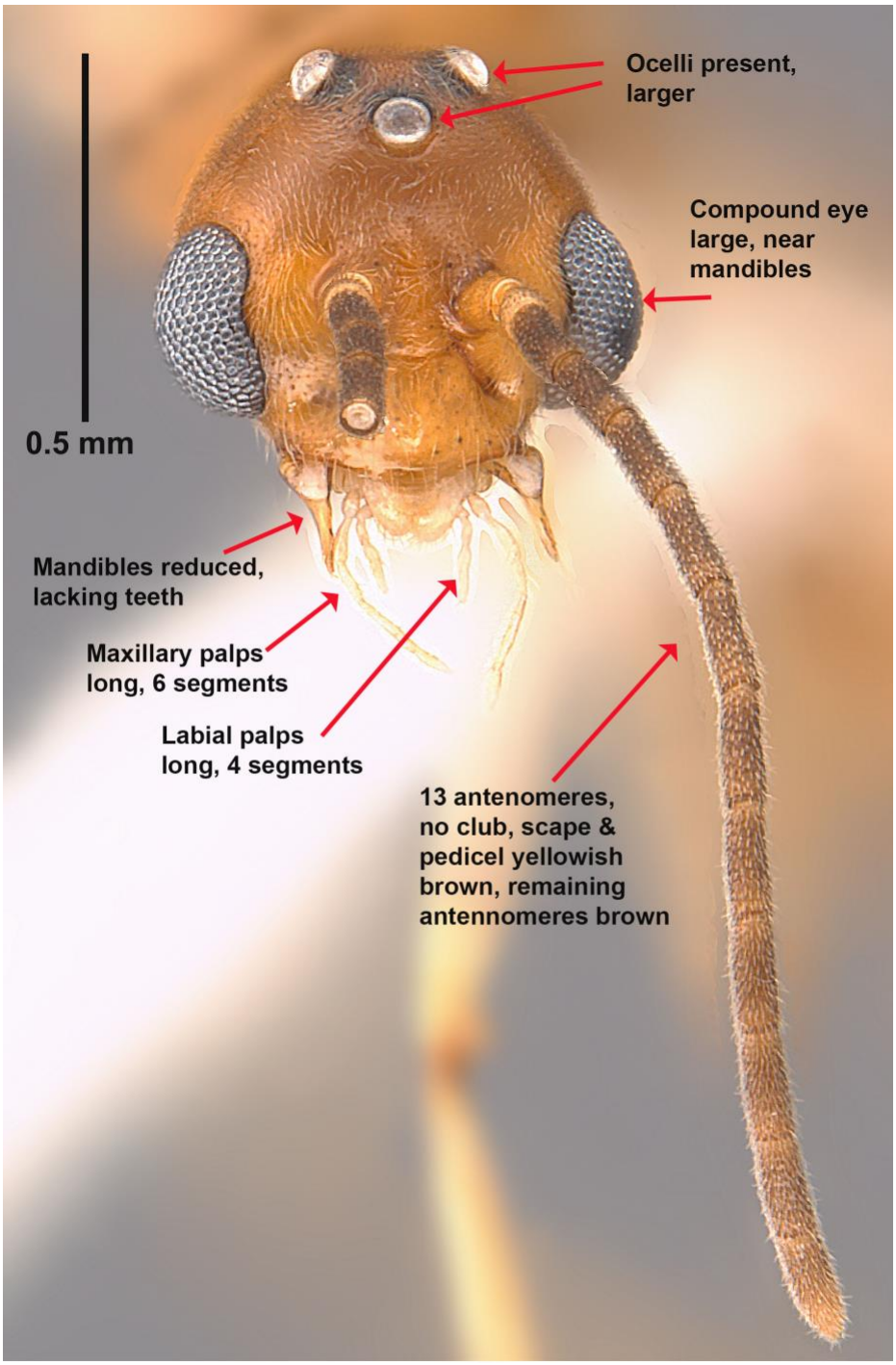

Figure 5. Full face view of *Brachyponera chinensis* male showing key characteristics.

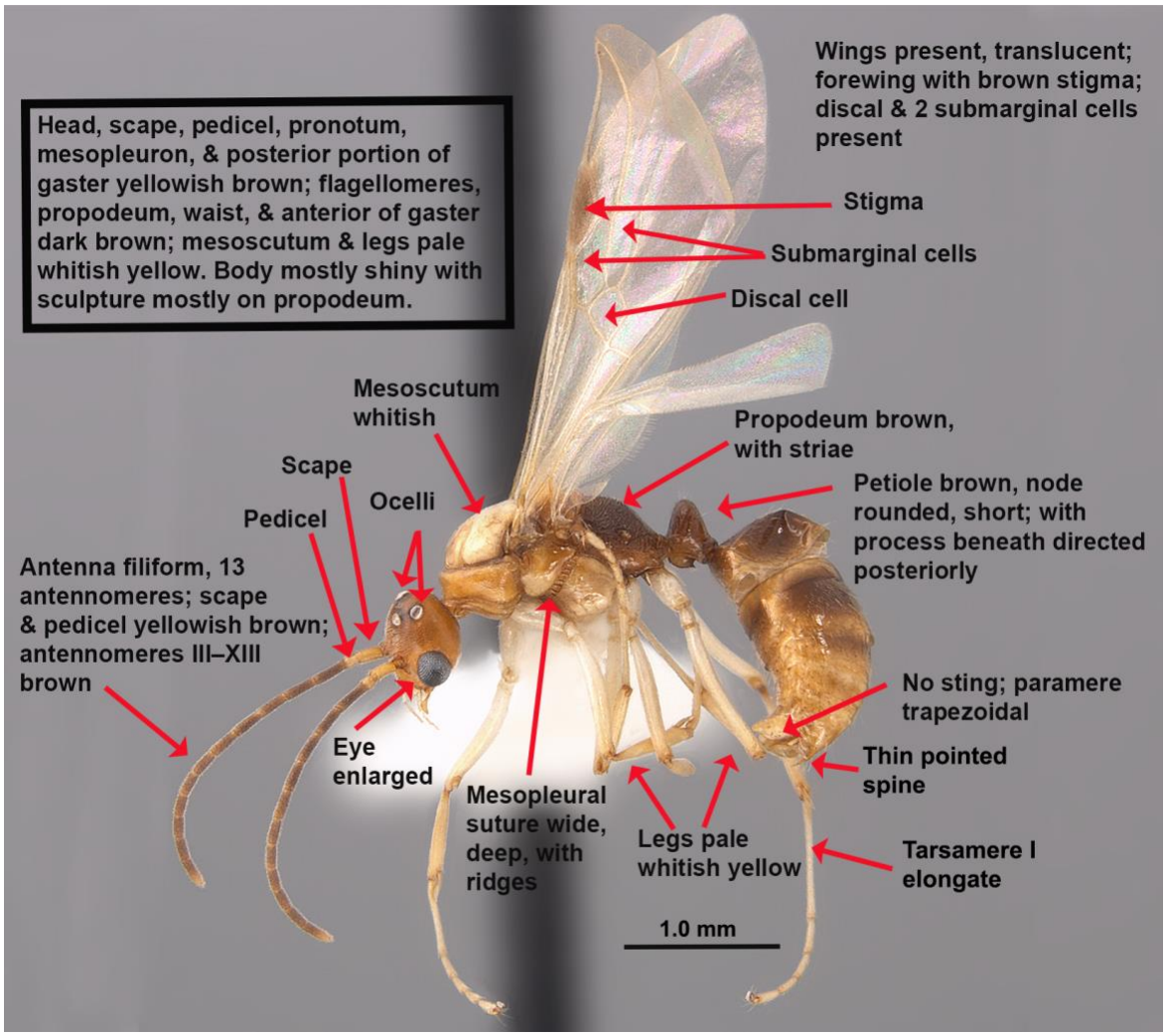

Figure 6. Lateral view of *Brachyponera chinensis* worker showing key characteristics.

Acknowledgments

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