Exotic Ants of Mississippi

Bulletin 1229 • May 2021

MISSISSIPPI STATE UNIVERSITY™
MS AGRICULTURAL AND
FORESTRY EXPERIMENT STATION

Exotic Ants (Hymenoptera: Formicidae) of Mississippi

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This publication is based on work supported by the National Institute of Food and Agriculture under Hatch project MIS-311260. Funding for ant research also has been obtained from NSF Grants BSR-9024810 and DEB-9200856, the Tombigbee National Forest (U.S. Forest Service), the Noxubee National Wildlife Refuge, Mississippi Natural Heritage Program Research Grant, USDA Forest Service Agreement No. 08-99-07-CCS-010, the William H. Cross Expedition Fund, and primarily by the USDA-ARS Areawide Management of Imported Fire Ant and Areawide Management of Invasive Ants Projects. Additionally, special cooperation has been provided by State Parks, National Forests, National Wildlife Refuges, the Natchez Trace Parkway, and from various private landowners in the Southeast.

This document was approved for publication as Bulletin 1229 of the Mississippi Agricultural and Forestry Experiment Station. It was published by the Office of Agricultural Communications, a unit of the Mississippi State University Division of Agriculture, Forestry, and Veterinary Medicine.

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ABSTRACT

Introductions of exotic organisms have become commonplace worldwide, in large part due to extensive global trade. When conditions are favorable, introduced species can become established in new regions, and in some cases become invasive. In the U.S., the Southeastern region has been particularly susceptible to successful establishment of exotic ant species, which may be related to the numerous oceanic ports in the region and suitable climatic conditions for tropical and subtropical species to thrive. To date, 69 exotic ant species are now established in the Southeast. Faunal surveys in Mississippi predating 2001, by Marion Smith and other researchers, recorded only eight exotic ant species. Since 2001, Mississippi Entomological Museum (MEM) faunistic surveys have recorded an additional 22 species of exotic ants to the known fauna of the state. These 30 introduced ant species are native to many regions, including Central America, South America, Europe, Africa, and Asia. In this bulletin, we present descriptions, photographs, natural history information, economic importance, and distribution maps for each exotic ant species in Mississippi.

INTRODUCTION

Due to increased global commerce and other factors, introductions of exotic ant species (also referred to as alien, introduced, or nonnative species) have become commonplace. For example, Suarez et al. (2005) reported that 232 species of ants were intercepted at U.S. ports of entry from 1927 to 1985. Although many species are successfully intercepted at these ports by customs officials, some species manage to "slip through the cracks." Of course, due to a variety of reasons, such as unsuitable climate or habitat, lack of food resources, and other reasons, not all species that are introduced into a new region become established. However, if conditions are suitable, they may thrive. Nowhere in the U.S. is this more evident than in the Southeast, where 69 species of exotic ants have been reported (MacGown 2020).

The high number of exotic species present in the Southeast is likely due to a combination of factors, but especially the moderate climate and numerous ports of entry in the region. The climate in parts of the Southeast is well suited for many tropical and subtropical ant species to thrive. Their spread may be further expanded as a result of global warming. Several exotic species formerly known to occur in the U.S. only in southern Florida are now established in southern Alabama, Georgia, Louisiana, and Mississippi. Entry points are a huge factor, and with a large percentage of the oceanic ports in the continental U.S. being located from North Carolina to Texas (aapa-ports.org), it's no surprise that numerous exotic species have become established in the region. Once introduced, exotic species may increase their range by natural dispersal, or with the inadvertent aid of humans. Typical means of transport are by trains and automobiles, in nursery stock, mulch, firewood, and hay bales, and through other similar mechanisms.

Florida, with its warm climatic conditions and extensive coastlines, boasts the highest number of exotic ant species of any state with 64. The number of exotic ant species in nearby states Alabama (29), Louisiana (26), Georgia (22),

and Mississippi (30) are lower but still higher than most other states (MacGown 2019).

The negative impacts, if any, of exotic ants are difficult to quantify after the ants become established in a new region. In many cases, exotic species that become established in a region simply expand their ranges into new areas with little notice from humans unless the insects happen to be pests. Studies on nonpest exotic species are few, and they typically do not address potential impacts on native ecosystems. However, a subset of established exotic species is considered "invasive" because they have negative effects on human households and health, the economy, and agriculture, and they may disrupt natural ecosystems (Ward et al. 2008). The economic impact alone of some of these species is huge. Baseline monitoring of exotic species is useful to ascertain species presence, population levels, distributions, geographic spread, potential negative impacts, and dispersal methods.

Exotic ant species found thus far in Mississippi are native to Africa, Argentina, Brazil, Europe, Greater Antilles, the Indo-Pacific region, Japan, Mexico, Puerto Rico, and Southeast Asia. However, a large percentage of the exotic species in Mississippi appear to have entered the state from other parts of the Southeast, rather than from their native regions.

In Mississippi, considerable efforts have been made to control the imported fire ants *Solenopsis invicta* Buren*, S. richteri* Forel*,* and their hybrid, *S. invicta* x *richteri.* Similarly, historical efforts were made to control the Argentine ant, *Linepithema humile* (Mayr) (Barber 1916). In spite of these efforts, these species still maintain a strong presence and continue to increase their distribution in Mississippi and other states. To complicate matters, other exotic species have made their way into the state, some of which show potential as invasive species.

To date, 30 exotic species (plus the hybrid imported fire ant) have been reported to occur in Mississippi. An additional species, *Nylanderia vividula* Nylander, has been considered at times to be an introduced species in the U.S., possibly native to Mexico. Trager (1984) wrote that this species was probably native to "Texas and western Mexico, but now found coast to coast in the South." More recently, Kallal and LaPolla (2012) simply referred to it as a native Nearctic species. *Nylanderia vividula* has been a well-established species in the South for a long time, and for the purposes of this bulletin, we consider it to be native.

Some of the exotic species in the state appear to pose minimal threats to humans and ecosystems, though this is difficult to measure for minute, cryptic species. Other species have been serious pests in this region for many years: imported fire ants, *Solenopsis invicta, S. richteri,* the hybrid fire ant *Solenopsis invicta* X *richteri;* the Argentine ant, *Linepithema humile*; and pharaoh ants, *Monomorium pharaonis* (Linnaeus). The tawny crazy ant, *Nylanderia fulva* (Mayr)*,* considered a serious invasive species in Texas and Florida, was first discovered in Mississippi in 2009 (MacGown and Layton 2010) and is now well established in several coastal localities. The minute dark rover ant, *Brachymyrmex patagonicus* Mayr, has rapidly increased it range in Mississippi and throughout much of the Southeast and west to California in a remarkably short time (MacGown et al. 2007). Several other recently reported species from Mississippi have potential for becoming invasive in the state including the Asian needle ant, *Brachyponera chinensis* Emery; the snap-jaw ant, *Odontomachus haematodus* (Linnaeus)*;* the longhorn crazy ant, *Paratrechina longicornis* (Latreille)*;* big headed ants, *Pheidole navigans* Forel and *P. obscurithorax* Naves*;* the graceful twig ant, *Pseudomyrmex gracilis* (Fabricius); the ghost ant, *Tapinoma melanocephalum* (Fabricius); and the pavement ant, *Tetramorium immigrans* Santschi.

The impacts of invasive species on natural ecosystems are poorly known. In disturbed areas of coastal Mississippi, MEM staff members have observed high levels of exotic species and low diversity of native species. When collecting in that region, we can often anticipate which native species will be present if selected exotic species are present or absent. The long-term effects of these species that appear to be taking the place of natives is unclear.

In addition to the exotic species already established in Mississippi, many other species known to occur in the Southeast or from other areas could potentially find their way into the state. Global warming may be a potential factor for tropical species becoming established in our region. For example, several of the species recently discovered by the MEM personnel in coastal Mississippi were once considered to be unlikely residents due to their need for warm weather. Early detection of newly arriving species and monitoring the spread of established exotic species are needed. Methods for early detection and monitoring have included regular field collections in coastal areas, plant nurseries, and state parks, along with examination of specimens in museums and private collections. Long-term monitoring and trapping will be critical in understanding movement of exotic species in our region.

METHODS AND MATERIALS

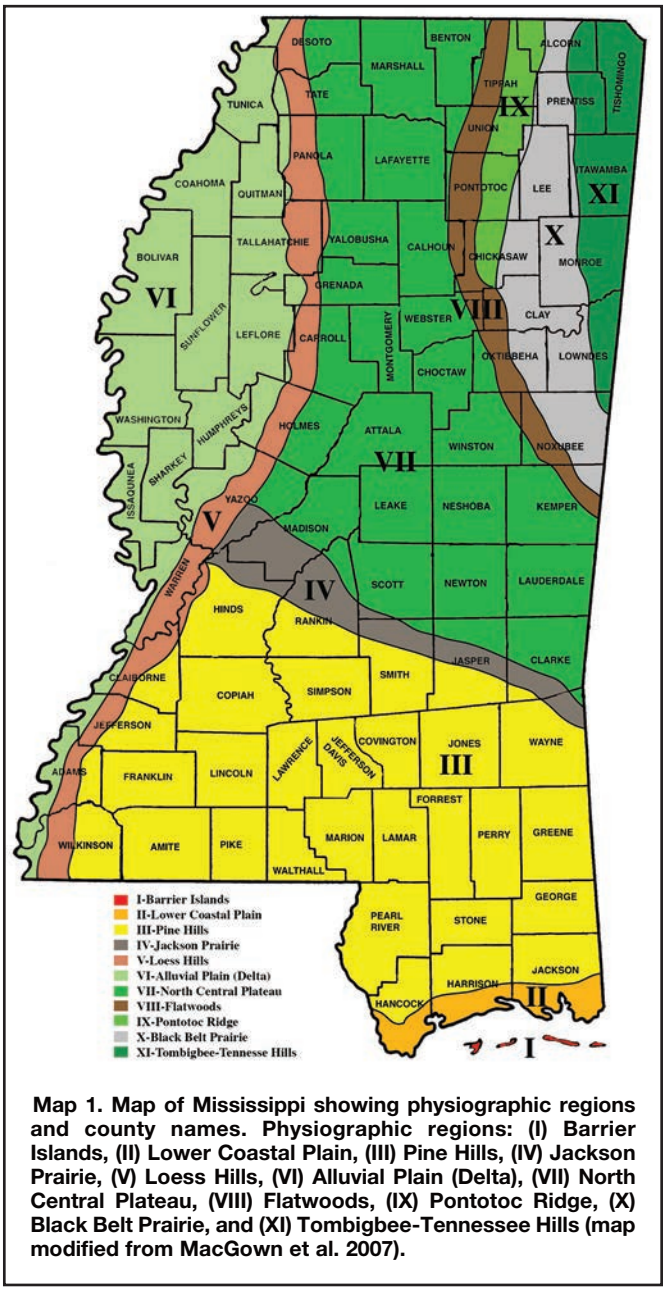
From 2001 through 2020, the Mississippi Entomological Museum (MEM) made numerous collections of ants throughout Mississippi and other parts of the Southeast to determine species diversity and distributions of both native and exotic ant species in this region. This baseline data on both native and exotic species complemented regional imported fire ant management programs initiated by the U.S. Department of Agriculture-Agricultural Research Service (USDA-ARS). Samples submitted by pest-control operators for identification have provided additional data. Surveys for wood-boring beetles supported by USDA-APHIS also have resulted in new distributional data based on ants (especially alates) captured in Lindgren funnel traps.

During the course of this project, collections were made from all four ecoregions (or 11 physiographic regions) and in all 82 counties in the state (Map 1). Many of the early collections by the MEM focused on natural areas, with minimal efforts made at sampling in disturbed areas, because the primary focus was to document native species in the state. However, in recent years, more effort was placed on identifying exotic species; thus, an emphasis was made to collect in disturbed areas such as open coastal habitats, roadsides, railways, vacant lots, hurricane damaged areas on the Gulf Coast, campgrounds at state parks and refuges, and plant nurseries known to receive exotic plants.

Ants were collected using a variety of methods, including pitfall traps, Lindgren funnel traps, blacklight (UV) traps, Malaise traps, sweeping and beating vegetation, baiting (Keebler Sandies Pecan Shortbread® cookies, StarKist® chunk light tuna in water, Bar S® hotdogs [chicken, beef, and pork], and various brands of peanut butter), soil and litter sampling, tearing apart rotting wood and hollow stems of grasses and other plants, and visual searching for ants and nests. Specimens were collected and stored in 90–95% ethanol, which would permit future use for possible DNA analysis.

Species determinations were made by MacGown. Representative voucher specimens were pinned, labeled with collection data, and stored in the MEM. Specimens were examined with a Leica MZ16 stereomicroscope with fiber optic illumination. Photographs of specimens and scale-lines were made using a Leica DFC 495 digital camera mounted on a Leica Z16 macroscope with a motorized focus column, and image stacks were merged using Leica Application Suite V 4.1.0 with Montage Module. Measurements of specimens were made using an optical reticle placed in an eyepiece of a Leica MZ16 stereomicroscope. Unless otherwise stated, descriptions are based on specimens in the MEM with a minimum of five specimens (if available) measured for each description. A list of abbreviations for measurements is given below.

Scientific names follow AntCat.org and common names follow Deyrup (2017) unless otherwise noted.



Map 1. Map of Mississippi showing physiographic regions and county names. Physiographic regions: (I) Barrier Islands, (II) Lower Coastal Plain, (III) Pine Hills, (IV) Jackson Prairie, (V) Loess Hills, (VI) Alluvial Plain (Delta), (VII) North Central Plateau, (VIII) Flatwoods, (IX) Pontotoc Ridge, (X) Black Belt Prairie, and (XI) Tombigbee-Tennessee Hills (map modified from MacGown et al. 2007).

Measurements

EL: Eye length—Maximum vertical length of eye in lateral view.

FWL: Forewing length—Maximum length of forewing (when present).

GL: Gaster length—Maximum length of gaster measured in lateral view.

HL: Head length—Maximum length of head, excluding mandibles, measured from anterior margin of clypeus to posterior-most edge of head in lateral view).

HW: Head width—Maximum width of head including eyes in full-face view.

ML: Mandible length—Measured from posterior margin of clypeus to apex of mandible in frontal view.

MeSL: Mesosomal length—Measured from anterior edge of pronotum to posterior corner of metapleuron in lateral view.

PetW: Petiole width—Widest width of petiole in dorsal view.

PPW: Postpetiole width—Widest width of postpetiole in dorsal view.

PronW: Pronotal width—Widest width of pronotum in dorsal view.

SL: Scape length—Maximum length of scape excluding basal constriction.

SPL: Propodeal spine length.

TL: Total length—Head Length + Mesosomal Length + Waist Length + Gaster Length.

WsL: Waist length—Length of petiole + postpetiole (if present).

(See Figure 1 for basic measurements.)

Illustrations Depicting Morphological Characters Used for Identification

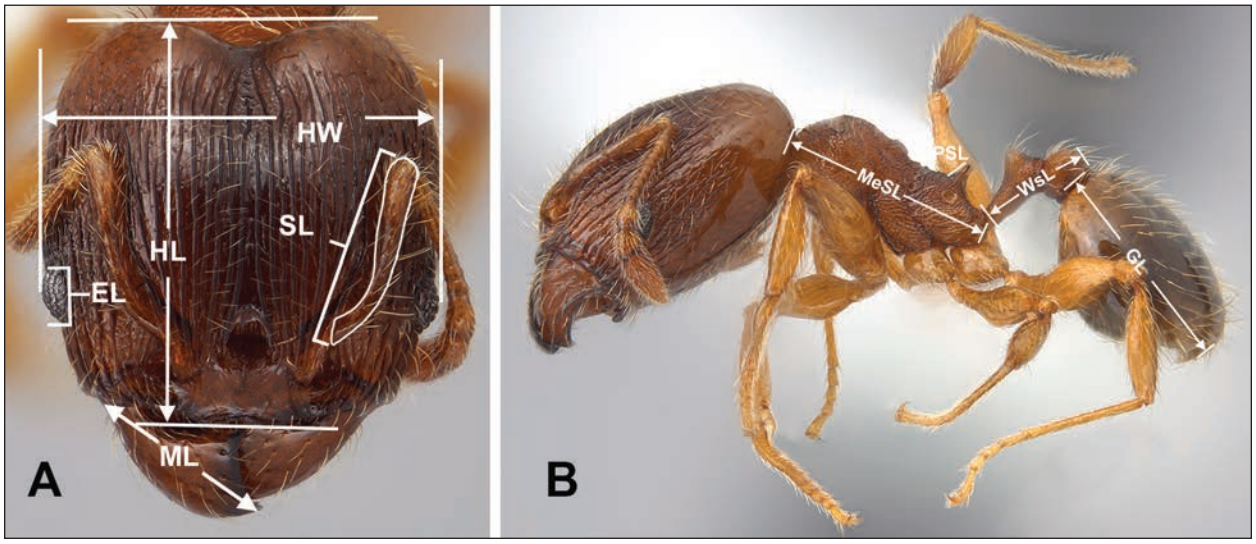


Figure 1. *Pheidole navigans* worker showing how measurements were made for this study. (A) Full face view: EL = eye length, HL = head length, HW = head width, ML = mandible length, and SL = scape length. (B) GL = gaster length, MeSL = mesosomal length, and WsL = waist length.

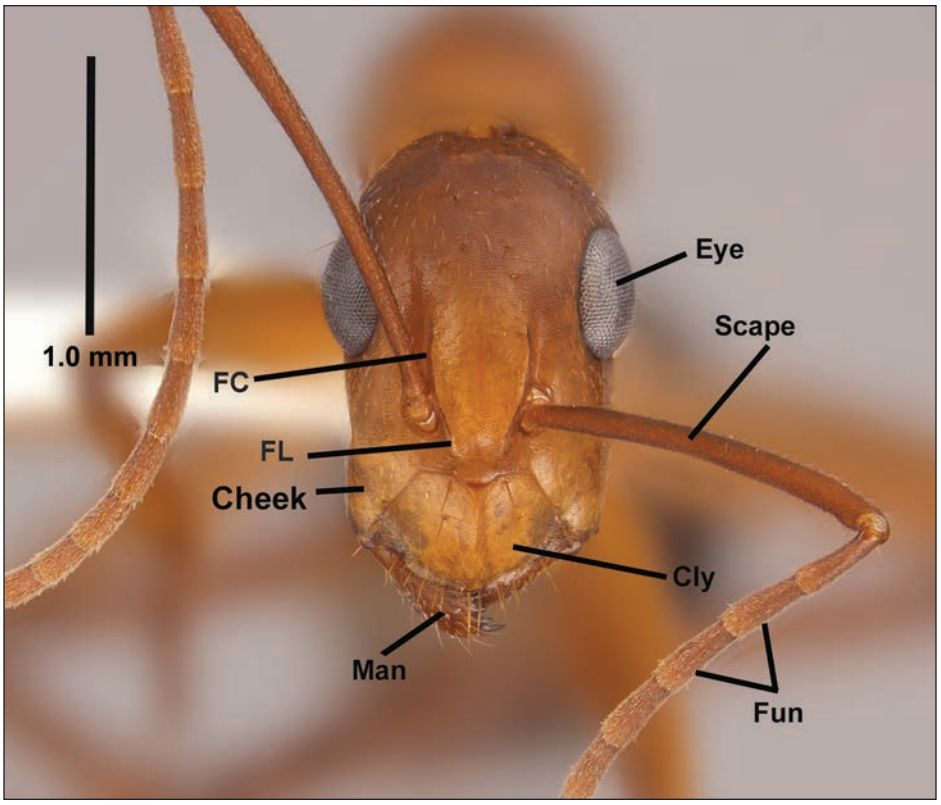


Figure 2. *Camponotus* cf. *tortuganus*, full face view of worker showing basic morphological features: Cheek, Cly = clypeus, Eye, FC = frontal carina, FL = frontal lobe, Fun = funiculus, Man = mandible, and Scape.

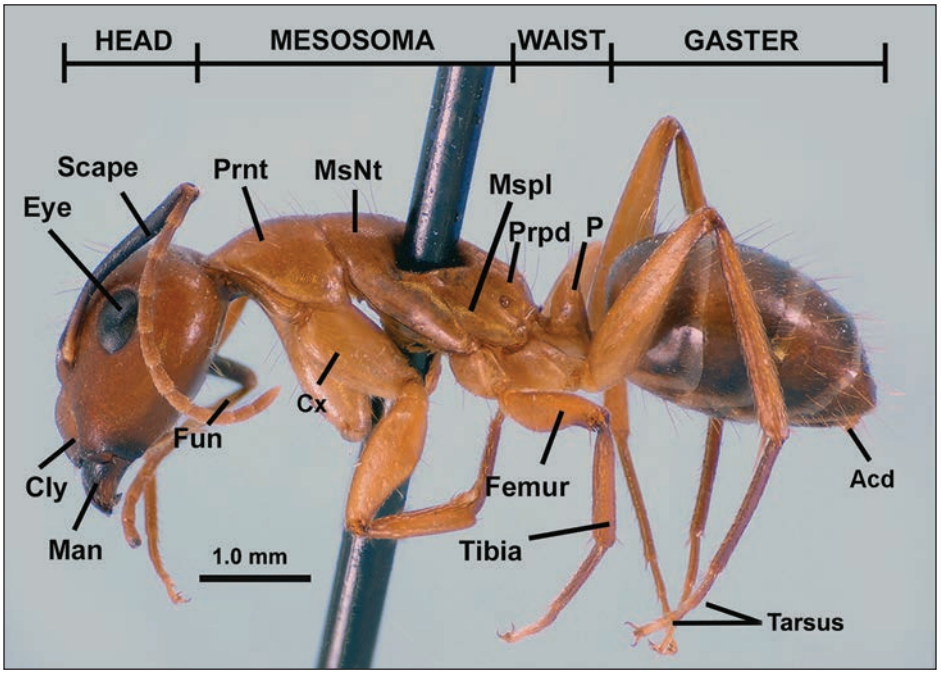


Figure 3. *Camponotus* cf. *tortuganus*, profile view of worker showing basic morphological features: Acd = acidopore, Cly = clypeus, Cx = coxa, E = Eye, Femur, Fun = funiculus, Gaster, Head, Man = mandible, MsNt = mesonotum, Mspl = mesopleura, Mesosoma, P = petiole, Prnt = pronotum, Prpd = propodeum, Scape, Tarsus, Tibia, and Waist.

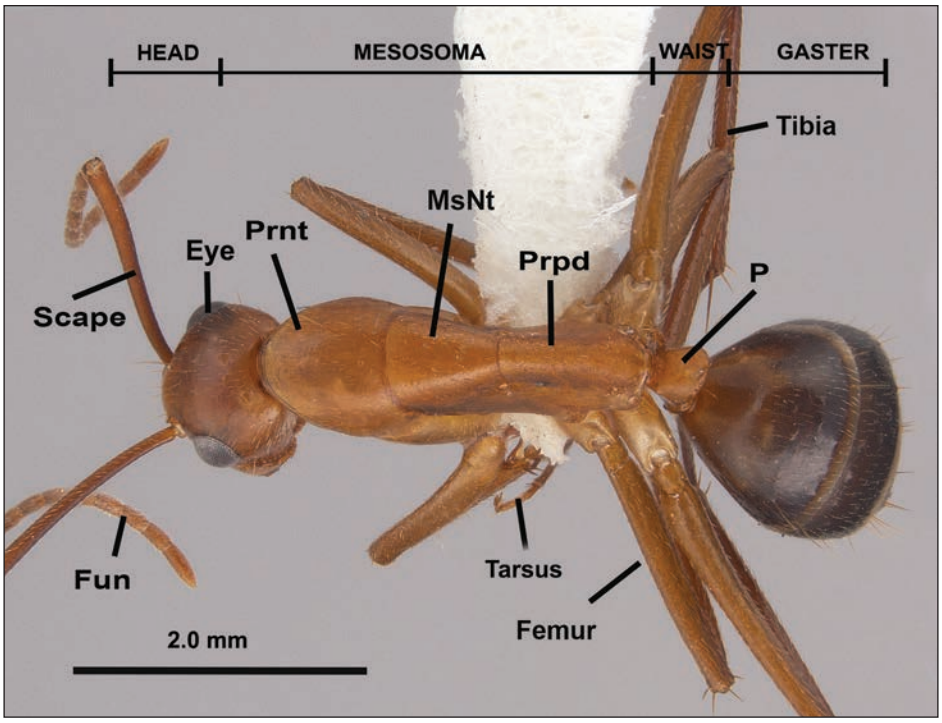


Figure 4. *Camponotus* cf. *tortuganus*, dorsal view of worker showing basic morphological features: Acd = acidopore, Cly = clypeus, Cx = coxa, E = Eye, Femur, FC = frontal carina, FL = frontal lobe, Fun = funiculus, Gaster, Head, Man = mandible, MsNt = mesonotum, Mspl = mesopleura, Mesosoma, P = petiole, Prnt = pronotum, Prpd = propodeum, Scape, Tarsus, Tibia, and Waist.

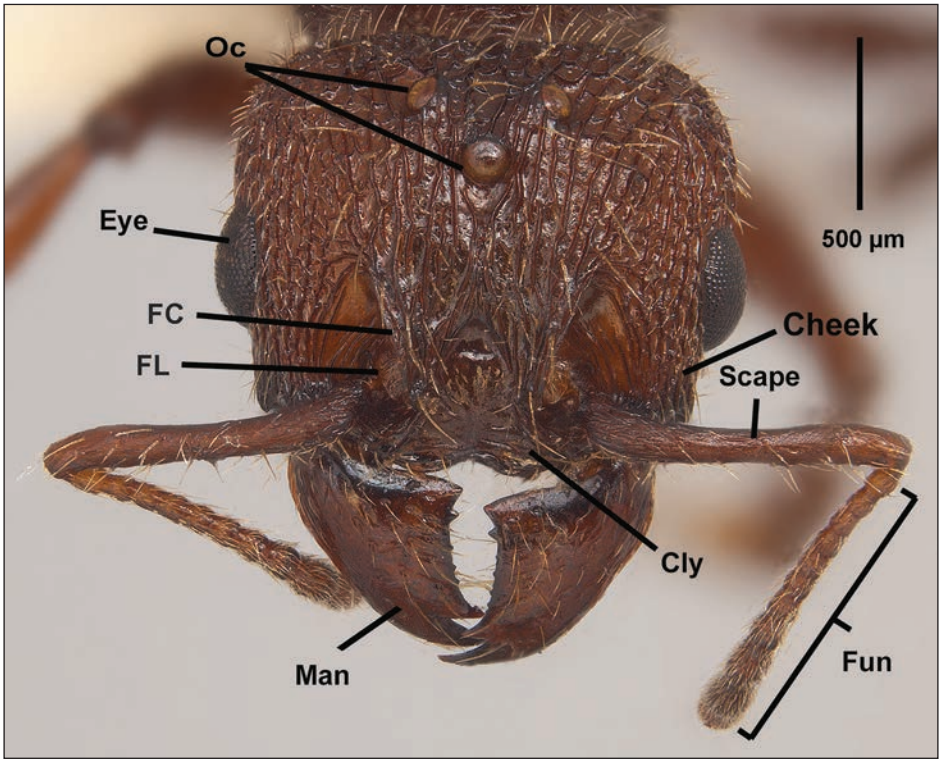


Figure 5. *Pheidole obscurithorax*, full face view of queen showing basic morphological features: Cheek, Cly = clypeus, E = Eye, FC = frontal carina, FL = frontal lobe, Fun = funiculus, Man = mandible, Oc = Ocelli, and Scape.

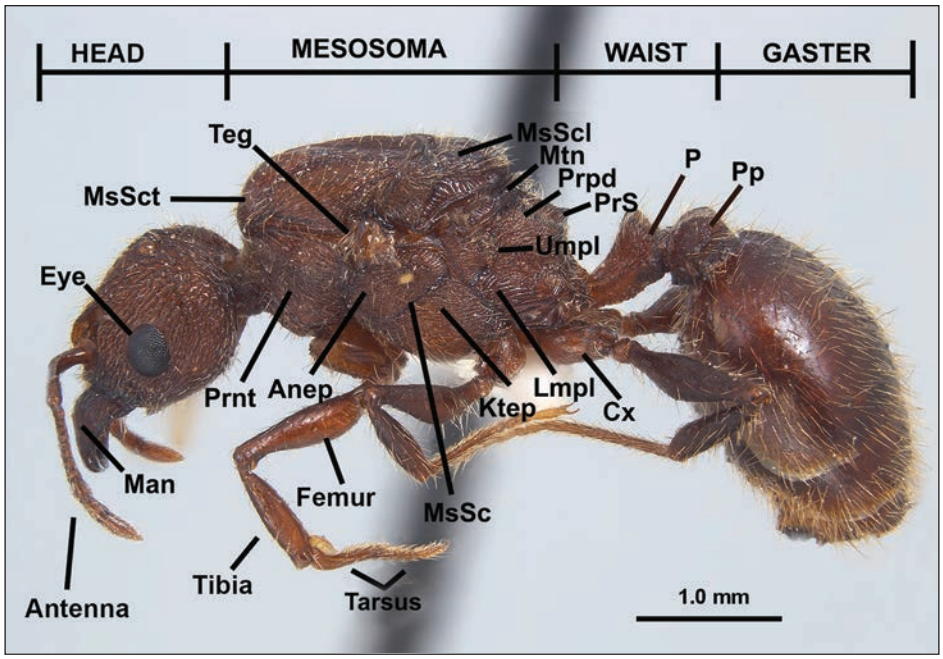


Figure 6. ***Pheidole obscurithorax*****, profile view of queen showing basic morphological features: Anep = anepisternum, Antenna, Cly = clypeus, Cx = coxa, E = Eye, Femur, Fun = funiculus, Gaster, Head, Ktep = katepisternum, Lmpl = lower metapleuron, Man = mandible, MsSc = mesospleural sulcus, MsScl = mesoscutellum, MsSct = mesoscutum, Mesosoma, Mtn = metanotum, P = petiole, Prnt = pronotum, Prpd = propodeum, Prs = propodeal spine, Scape, Tarsus, Teg = tegula, Tibia, Umpl = upper metapleuron, and Waist.**

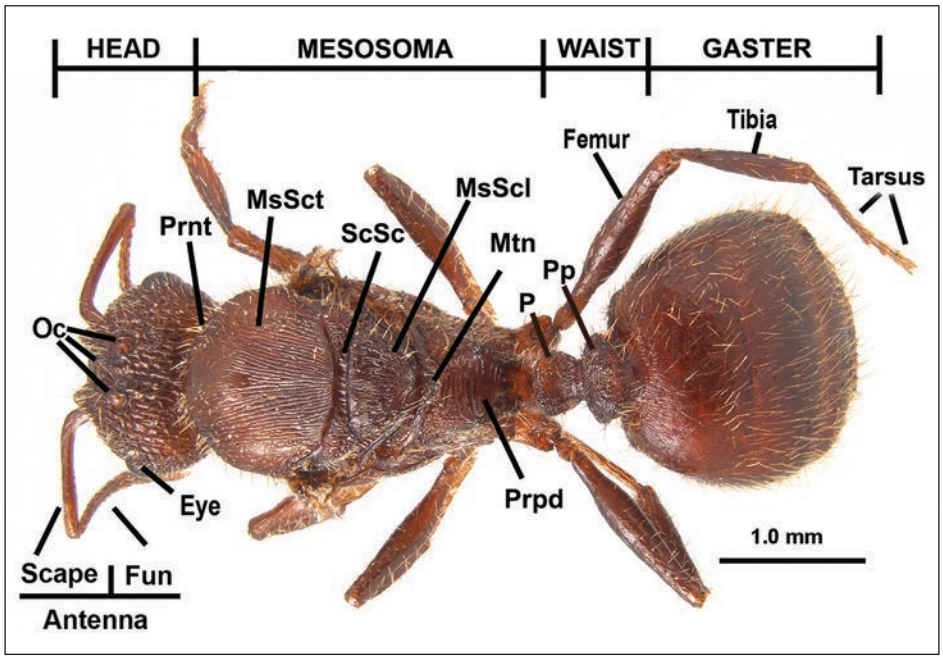


Figure 7. ***Pheidole obscurithorax*****, dorsal view of queen showing basic morphological features: Antenna, Cx = coxa, E = Eye, Femur, Fun = funiculus, Gaster, Head, MsScl = mesoscutellum, MsSct = mesoscutum, Mesosoma, Mtn = metanotum, P = petiole, Prnt = pronotum, Prpd = propodeum, Scape, ScSc = scutellar sulcus, Tarsus, Teg = tegula, Tibia, and Waist.**

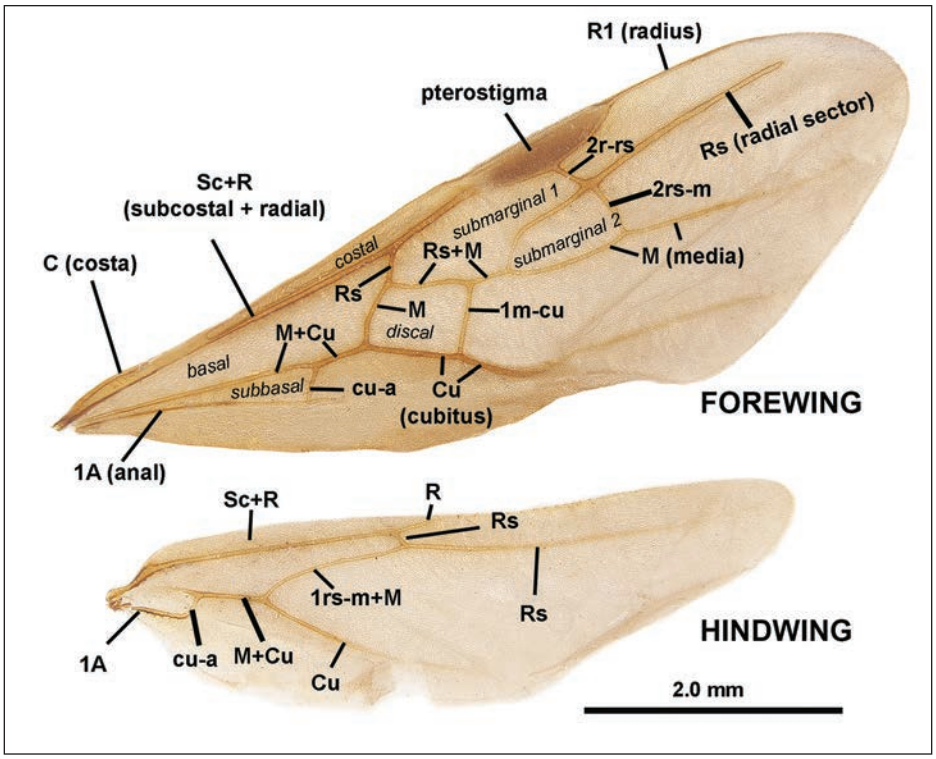


Figure 8. ***Pheidole obscurithorax*****, forewing (top) and hindwing (bottom) of a queen showing labeled pterostigma, wing veins, and closed cells. Veins: C (costa). Sc + R (subcosta + radius), R1 (radius), Rs (radial sector), Rs + M (radial sector + media), 2r-rs (radial-radial sector cross vein), 2rs-m (radial sector-medial cross vein), M (media), M + Cu (media + cubitus), 1m-cu (medial-cubital cross vein), Cu (cubitus), cu-a (cubital-anal cross vein), A (anal), and 1rs-m+M (hindwing, radial sector-medial cross vein fused with media). Cells: costal, basal, subbasal, submarginal 1, submarginal 2, and discal.**

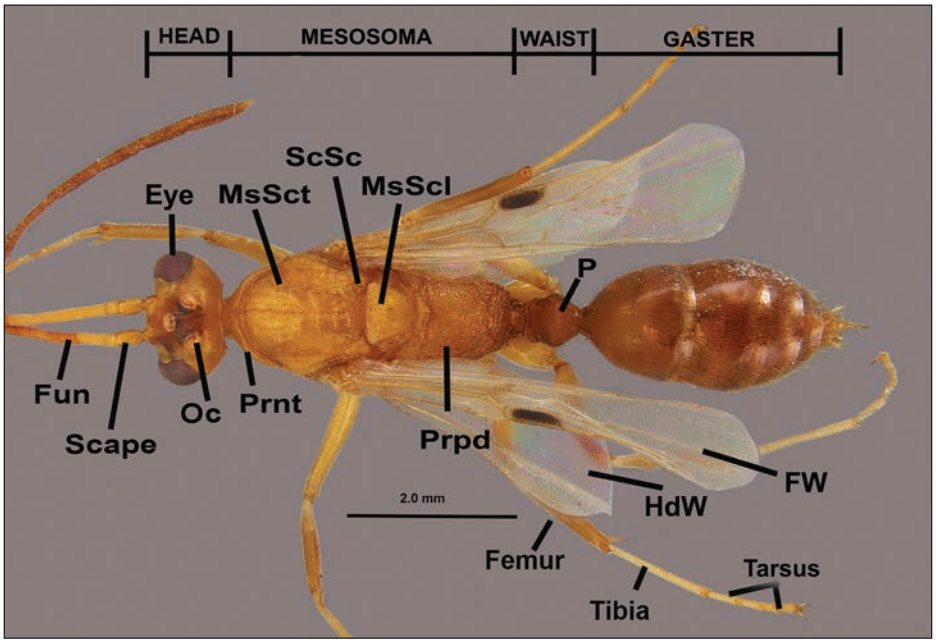


Figure 9. ***Odontomachus haematodus*** **profile view of male showing basic morphological features: Anep = anepisternum, Antenna, Cly = clypeus, Cx = coxa, E = Eye, Femur, Fun = funiculus, FW = forewing, HdW = hindwing, Ktep = katepisternum, Lmpl = lower metapleuron, MsSc = mesopleural sulcus, MsScl = mesoscutellum, MsSct= mesoscutum, P = petiole, Prnt = Pronotum, Prpd = propodeum, Scape, Tarsus, Tibia, and Umpl = upper metapleuron.**

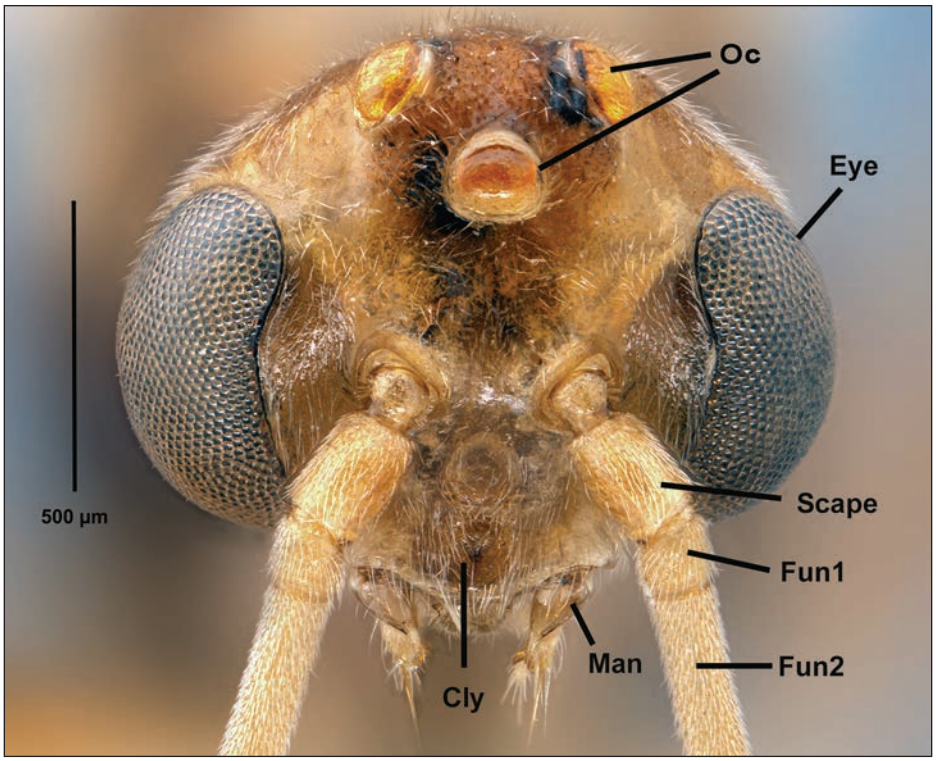


Figure 10. ***Odontomachus haematodus*****, full face view of male showing basic morphological features: Cheek, Cly = clypeus, E = Eye, FC = frontal carina, FL = frontal lobe, Fun1 = first funicular segment, Fun2 = second funicular segment, Man = mandible, Oc = Ocelli, and Scape.**

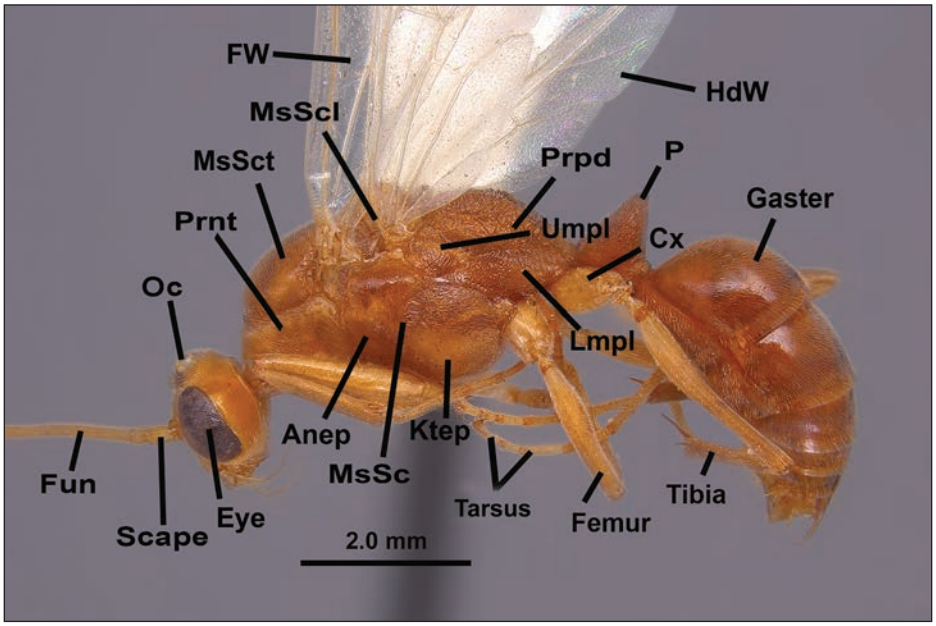


Figure 11. ***Odontomachus haematodus*** **dorsal view of male showing basic morphological features: Cx = coxa, E = Eye, Femur, Fun = funiculus, FW = forewing, Gaster, Head, HdW = hindwing, MsScl = mesoscutellum MsSct = mesoscutum, Mesosoma, P = petiole, Prnt = Pronotum, Prpd = propodeum, Scape, ScSc =scutellar sulcus, Tarsus, Tibia, and Waist.**

LIST OF EXOTIC ANT SPECIES IN MISSISSIPPI

Brachymyrmex obscurior Forel
Brachymyrmex patagonicus Mayr
Brachyponera chinensis Emery
Camponotus planatus Roger
Camponotus cf. *tortuganus* Emery
Cardiocondyla wroughtonii (Forel)
Cyphomyrmex rimosus (Spinola)
Gnamptogenys triangularis (Mayr)
Hypoponera opaciceps (Mayr)
Hypoponera punctatissima (Roger)
Linepithema humile (Mayr)
Monomorium floricola (Jerdon)
Monomorium pharaonis (Linnaeus)
Nylanderia fulva (Mayr)
Odontomachus haematodus (Linnaeus)
Paratrechina longicornis (Latreille)
Pheidole navigans Forel
Pheidole obscurithorax Naves
Pseudomyrmex gracilis (Fabricius)
Solenopsis invicta Buren
Solenopsis richteri Forel
Strumigenys epinotalis Weber
Strumigenys hexamera (Brown)
Strumigenys margaritae Forel
Strumigenys membranifera Emery
Strumigenys silvestrii Emery
Tapinoma melanocephalum (Fabricius)
Tetramorium bicarinatum (Nylander)
Tetramorium immigrans Santschi
Tetramorium lanuginosum Mayr

Brachymyrmex obscurior Forel 1893 — "obscure rover ant"

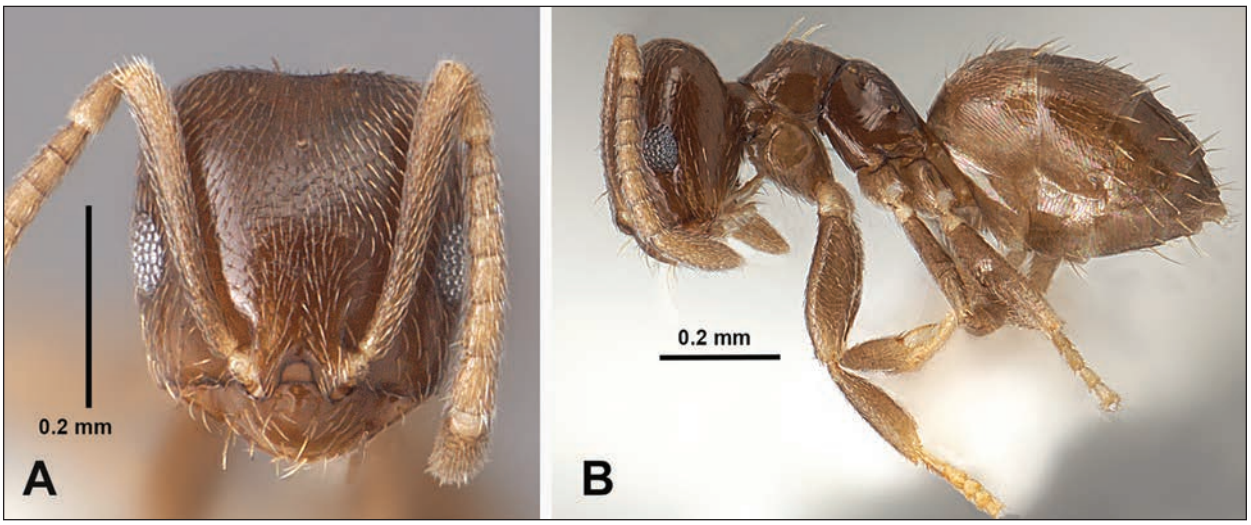


Figure 12. *Brachymyrmex obscurior* worker (A) full face and (B) lateral view.

Summary

Brachymyrmex obscurior Forel (Formicinae) is a minute yellowish-brown to brown species native to the Neotropics. In the U.S., it is considered to be an introduced species. In southern Florida, this species is an occasional nuisance pest. This species is only known from a single locality in Mississippi and thus far has not become widespread in the state.

Diagnosis

In Mississippi, the tiny size (TL 1.0–1.50 mm), brown coloration, 4–6 stiff erect setae on promesonotal dorsum, and nine-segmented antenna will separate *B. obscurior* from most other species. The only similar species in the Southeast is the exotic *B. patagonicus*. Workers of *B. obscurior* differ from *B. patagonicus* by having smaller eyes (1/4 to 1/5 the length of head, instead of about 1/3 the length of head), by having ocelli, and by the much denser and finer pubescence on the gaster. Additionally, *B. obscurior* is only known from a single location in Mississippi, whereas *B. patagonicus* is widespread and abundant.

Descriptions

Worker (Figure 12): Minute (HL 0.43–0.52 mm, HW 0.41–0.46 mm, EL 0.09–0.11 mm, SL 0.35–0.40 mm, MeSL 0.40–0.47 mm) (n=5, MEM). Yellowish-brown to brown. Head slightly longer than wide, with abundant, fine pubescence; eye length 1/4 to 1/5 of the head length; ocelli present; antennae nine-segmented, lacking a club; mandibles with five teeth. Mesosoma compact, lacking obvious sculpture, sides of mesosoma shiny, mostly lacking pubescence, dorsum of promesonotum and propodeum with scattered pubescence, dorsum of promesonotum with four or more stiff, semierect setae; promesonotum fused and raised; metanotal suture impressed; propodeum broadly sloped, lacking spines. Waist with a single petiolar node, node somewhat flattened and often hidden by gaster from above. Gaster with dense appressed pubescence and scattered semierect setae; acidopore present.

Queen (Figure 13A): (Description based on photographs by Lyle Buss). Approximately three times longer than worker (TL 4.0–4.3 mm). Concolorous reddish-brown. Head about as wide as long, with dense pubescence; eyes large, length more than 1/4 head length; ocelli present; antenna nine-segmented, lacking club. Mesosoma enlarged, elongated, roundly flattened dorsally; mesosoma with dense, fine pubescence, with scattered, longer erect setae dorsally; propodeum lacking adornment. Wings large, clear, with strong venation; forewing with one submarginal cell, pterostigma present; hindwing lacking closed cells. Waist with a single petiolar node, often hidden by gaster from above. Gaster enlarged, with fine, dense pubescence and longer stiff erect setae present, especially along tergite margins; acidopore present.

Male (Figure 13B): (Description based on photographs by Lyle Buss). Approximately the same size as workers to slightly larger (TL about 1.5 mm). Color, dark reddish-brown to blackish-brown. Head slightly wider than long; eyes large, at least 1/2 the length of the head; three large raised ocelli present; antenna 10-segmented, first funicular segment enlarged, globular; mandibles simple. Mesosoma enlarged, squared (in profile), mesoscutum enlarged, overhanging pronotum; mesosomal dorsum with dense, fine pubescence, larger erect setae absent; pronotum, mesopleura, and propodeum shiny, with

reduced setation. Wings large, clear; forewing with one submarginal cell; hindwings with reduced venation. Waist with a single petiolar node, often hidden by gaster from above. Gaster shiny, with scattered fine pubescence and a few larger erect setae along tergite margins.

Biology

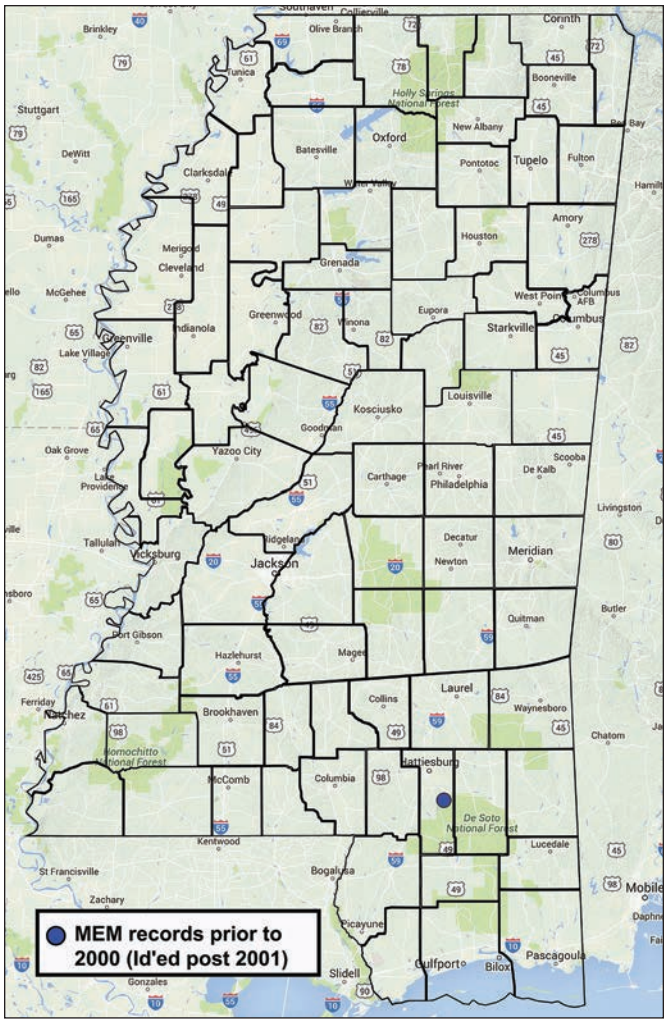
Tschinkel and Hess (1999) reported that *B. obscurior* nests in the ground. According to Morrison (2006), this species appears to be well adapted to extreme, marginal habitats, including isolated small cays in the Bahamas. This species is attracted to sweet liquids and has been reported to visit extrafloral nectaries (Koptur et al. 2010) and collect honeydew from homopterans (Larsen et al. 1991, Navarrete et al. 2013). In Florida, this species has been reported to be widespread but infrequently collected (Deyrup 2003).

Pest Status

Despite its supposed rarity in Florida, *B. obscurior* is listed by Klotz et al. (1995) as being a minor urban pest there. Only one record is known from Mississippi (MEM records), and thus, it is not currently considered a pest in this state. This tiny species does not possess a sting and at most would be considered a minor household nuisance species.

Distribution

This species is native to Mexico, Central America, and South America (Antweb 2020). In the U.S., confirmed records of this species are known from Florida, Hawaii, and Mississippi (MEM data). Antweb.org lists additional records from Georgia, Louisiana, Missouri, and Washington. In Mississippi, it has only been collected in Forrest County (Map 2).



Map 2. *Brachymyrmex obscurior* site records in Mississippi based on MEM specimens.

Figure 13. *Brachymyrmex obscurior* (A) lateral view of alate queen and (B) lateral view of male (Photos by Lyle Buss).

Figure 14. ***Brachymyrmex patagonicus*** **worker (A) full face view and (B) lateral view.**

Summary

Brachymyrmex patagonicus Mayr (Formicinae) is a minute, dark-brown species native to the Neotropics (Antweb 2020). This species has become widespread in the Southeast and has expanded its range to isolated locations in the Southwest and California. The dark rover ant was first reported from the U.S. in 1978 (Wheeler and Wheeler 1978), from Louisiana; however, this species has actually been in the U.S. since at least the 1950s based on material collected by E. O. Wilson from Mobile, Alabama (Pers. Comm., Chris Wilson). However, populations of this seemingly innocuous ant species suddenly exploded after 2009, and since then this species has spread rapidly throughout much of the Southeast and as far west as California (Martinez et al. 2011).

Taxonomic Status

Based on a recent worldwide molecular and morphological treatment of *Brachymyrmex* by Ortiz-Sepulveda et al. (2019), a possibility has been raised that specimens identified as *B. patagonicus* in the U.S. are actually B. bruchi Forel. Ortiz-Sepulveda et al. (2019) examined very little material from the Southeast, though they included isolated records of *B. bruchi* from Florida, Louisiana, and Texas. No mention of *B. patagonicus* being found in the U.S. was made. We ran representative specimens from Mississippi previously identified as *B. patagonicus* through their key but were unable to conclusively determine the identity of our species based on the provided couplets with the closest matches being *B. bruchi* Forel, *B. oculatus* Santschi, and *B. patagonicus*. Based on large eye size alone, we keyed Mississippi specimens to *B. oculatus,* but our specimens appear to have at least a medial ocellus, which is lacking in *B. oculatus.* Likewise, in the couplet separating *B. bruchi* and *B. patagonicus,* the U.S. specimens we examined appeared to have characteristics of both species (scapes shorter as in *B. patagonicus* and often more than two erect pronotal setae as in *B. bruchi.* For the purposes of this bulletin, we are using the currently widely used name of *B. patagonicus* for the common invasive U.S. species until this confusion of identity is resolved. Descriptions used in this bulletin are based on specimens collected in Mississippi.

Diagnosis

In Mississippi, the tiny size (TL ≈ 1.50 mm), brown coloration, and nine-segmented antenna will separate workers of *B. patagonicus* from all other species except for *B. obscurior*. Workers of *B. patagonicus* are similar to *B. obscurior* but differ by having larger eyes (≈ 1/3 the length of head, instead of about 1/4 –1/5 the length of head), and by the sparser pubescence on the gaster. Additionally, *B. patagonicus* is widespread and abundant in the state, whereas *B. obscurior* is only known from a single location.

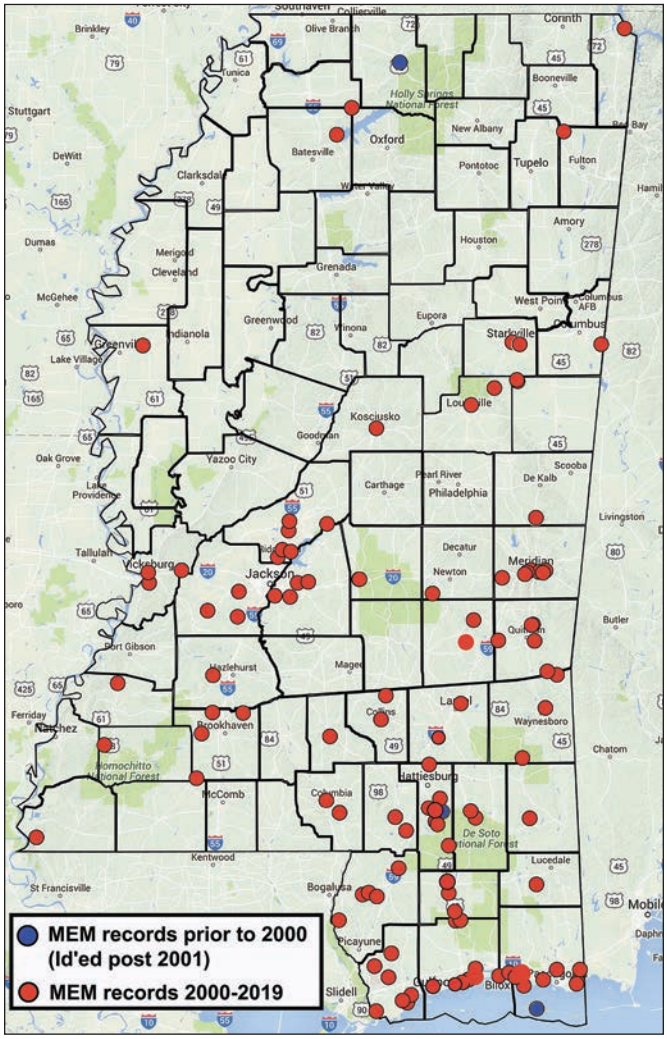
Descriptions

Worker (Figure 14): Minute (HL 0.50–0.52 mm, HW 0.43–0.48 mm, SL 0.45–0.48 mm, EL 0.15–0.16 mm, MeSL 0.43–0.52 mm) (n=15, MEM specimens). Entire

body dark reddish-brown to blackish-brown. Head slightly longer than wide, with abundant, coarse, short pubescence; eye large, about 1/3 the length of the head; ocelli extremely minute; antennae nine-segmented, lacking a club. Mesosoma compact, shiny, with scattered fine pubescence, three to nine (usually four to six) stout, erect setae present on promesonotal dorsum; propodeal declivity broadly sloped, spines lacking. Waist with a single petiolar node, often hidden by gaster from above. Gaster with scattered, long, erect setae, especially along the edges of the tergites, and with somewhat sparse, decumbent hairs; acidopore present.

Queen (Figure 15): About three times larger than worker (HL 0.74–0.75 mm, HW 0.73–0.76 mm, SL 0.62–0.67 mm, EL 0.27–0.30 mm, MeSL 1.24–1.42 mm) (n=15, MEM specimens). Concolorous light brown. Head about as wide as long, with abundant, fine pubescence, and with long erect setae present; large eyes; ocelli present; antenna nine-segmented. Mesosoma enlarged, elongated, roundly flattened dorsally; entire mesosoma with moderately dense, fine pubescence; dorsum with 30–40 long erect setae; propodeal spines lacking. Wings large, clear, with strong venation; forewing with one submarginal cell, pterostigma present; hindwing lacking closed cells, seven hammuli present. Waist with a single petiolar node, often hidden by gaster from above. Gaster with moderately dense, fine pubescence; erect hairs present along apical edges of sternites and tergites; acidopore present.

Male (Figure 16): About the same size as worker (HL 0.32–0.37 mm, HW 0.32–0.37 mm, SL 0.24–0.29 mm, EL 0.17–0.20 mm, MeSL 0.80–0.84 mm) (n=5, MEM



Map 3. *Brachymyrmex patagonicus* site records in Mississippi based on MEM specimens.

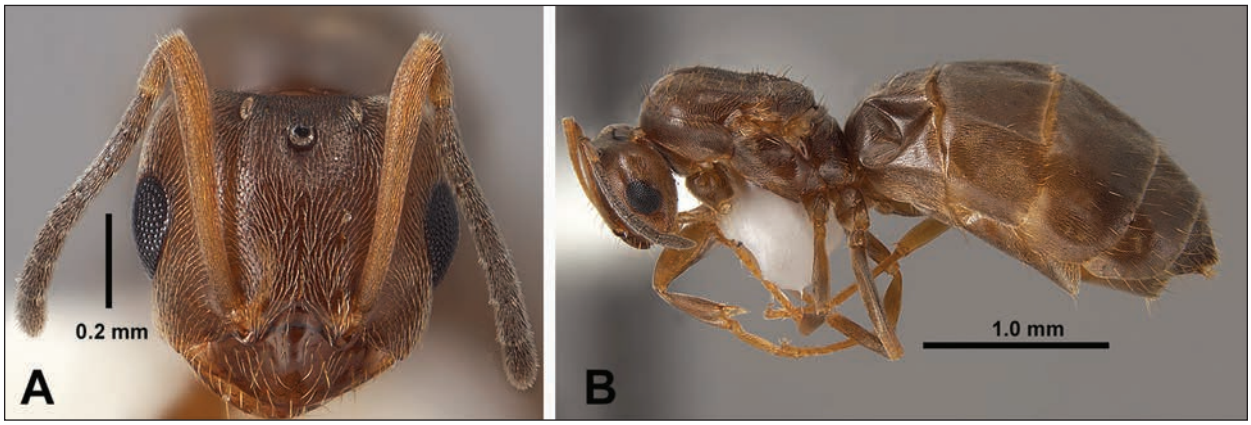


Figure 15. *Brachymyrmex patagonicus* queen (A) full face view and (B) lateral view.

specimens). Head dark brown to blackish-brown, rest of body, including appendages, light brown. Head about as wide as long, with sparse fine pubescence; erect setae lacking except on mouthparts; integument shiny; eyes large, at least 1/2 the length of the head; three large raised ocelli present; antennae 10-segmented, first funicular segment enlarged, globular; mandibles simple. Mesoscutum enlarged, overhanging pronotum; mesosomal integument shiny, with sparse pubescence, erect setae lacking. Wings large, clear; forewing with one submarginal cell; hindwings with reduced venation. Waist with a single petiolar node, often hidden by gaster from above. Gaster shiny, with scattered fine pubescence and a few larger erect setae along tergite margins.

Biology

Brachymyrmex patagonicus nests in the soil, rotting wood, debris, structures, and numerous other microhabitats in a variety of habitats ranging from forests, beaches, and roadsides to suburban areas. *Brachymyrmex patagonicus* is omnivorous, though Dash et al. (2005) reported that a large part of its diet was honeydew produced by insects, especially subterranean hemipterans. This species is attracted to sweet baits such as honey or cookies (MacGown et al. 2007). Colonies of *B. patagonicus* may contain hundreds of workers packed into a small, sheltered area, and colonies are often abundant and may be found within a few centimeters from one another (MacGown et al. 2007). The social structure of *B. patagonicus* has not been studied, but apparently separate colonies show considerable mutual tolerance (MacGown et al. 2007). Alates have been collected from late April through early August.

Pest Status

Brachymyrmex patagonicus is a nuisance pest; alates and foraging workers may enter houses, hospitals, schools and other man-made structures to forage and/or nest (MacGown et al. 2007). The species may occur in high numbers with numerous small colonies, making control difficult. This species, which lacks a sting, is not known to cause structural damage or to bite. Swarming alates are occasionally mistaken by homeowners as flying termites and at times are a nuisance.

Distribution

This species is native to Argentina and Paraguay. In the U.S., it has been reported from Alabama, Arkansas, Arizona, California, Florida, Georgia, Louisiana, Mississippi, North Carolina, Nevada, South Carolina, and Texas. Mississippi records in the MEM include Attala, Clarke, Forrest, Franklin, George, Greene, Hancock, Harrison, Hinds, Itawamba, Jackson, Jeff Davis, Jefferson, Lamar, Lauderdale, Lincoln, Madison, Newton, Noxubee, Oktibbeha, Pearl River, Perry, Rankin, Scott, Stone, Warren, Washington, Wayne, and Wilkinson Counties (Map 3).

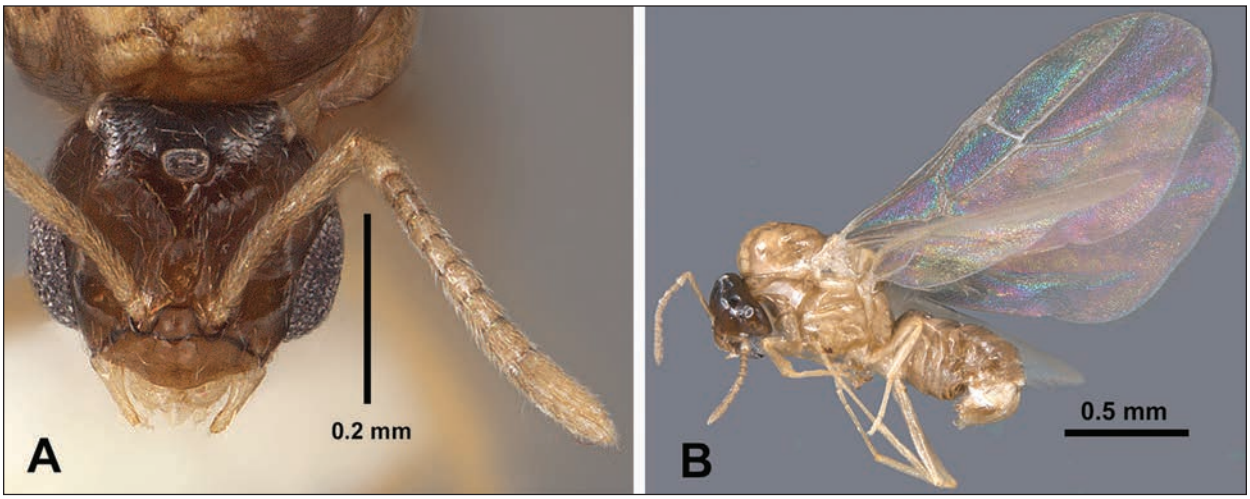


Figure 16. *Brachymyrmex patagonicus* male (A) full face view and (B) lateral view.

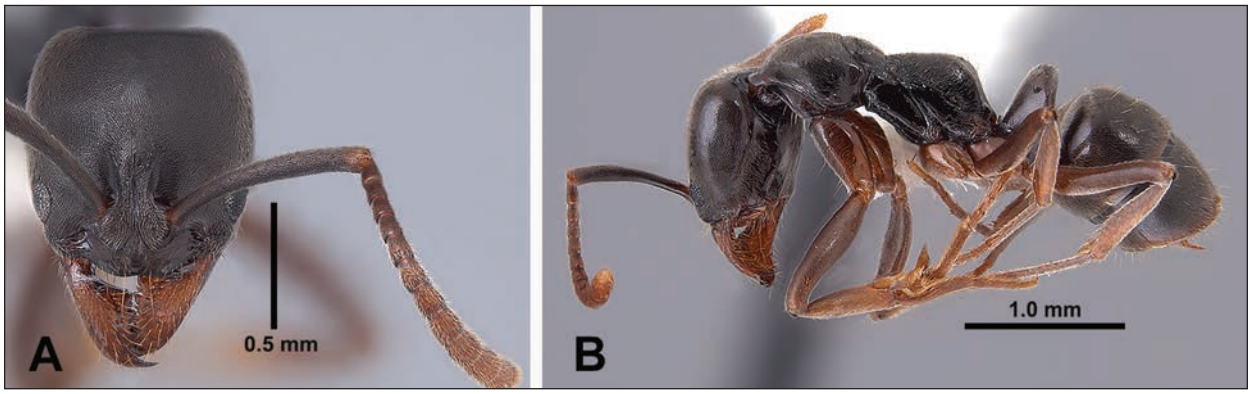


Figure 17. ***Brachyponera chinensis*** **worker (A) full face view and (B) lateral view.**

Summary

Brachyponera chinensis Emery (Ponerinae), previously assigned to *Pachycondyla*, is a medium-sized, stinging species native to Japan (Yashiro et al. 2010). Since it was first detected in the U.S. in Dekalb County, Georgia, in 1932 (Smith, 1934), populations have spread throughout large areas along the East Coast and into other regions. It is considered an invasive species that stings humans and may displace native species. A winged queen of this species was reported in 2013 (MacGown et al. 2013) from Pearl River County, Mississippi, which, thus far, is the only known record from the state.

Diagnosis

Workers of *B. chinensis* can be recognized by their medium size (TL ≈ 4.0–5.0 mm), shiny, dark blackish appearance, lack of spines or other ornamentation, the single petiolar node, and sting. This species is similar in size to average-sized fire ants (*Solenopsis* spp.) but differs by having only node and by its nesting in wooded habitats. In the Southeast, it could be possibly confused with other ponerine ants (e.g., *Hypoponera, Leptogenys, Pachycondyla,* and *Ponera*), but it differs by the promesonotum being distinctly set off from the propodeum, by the very shiny mesopleura, and by its super colonial nesting behavior.

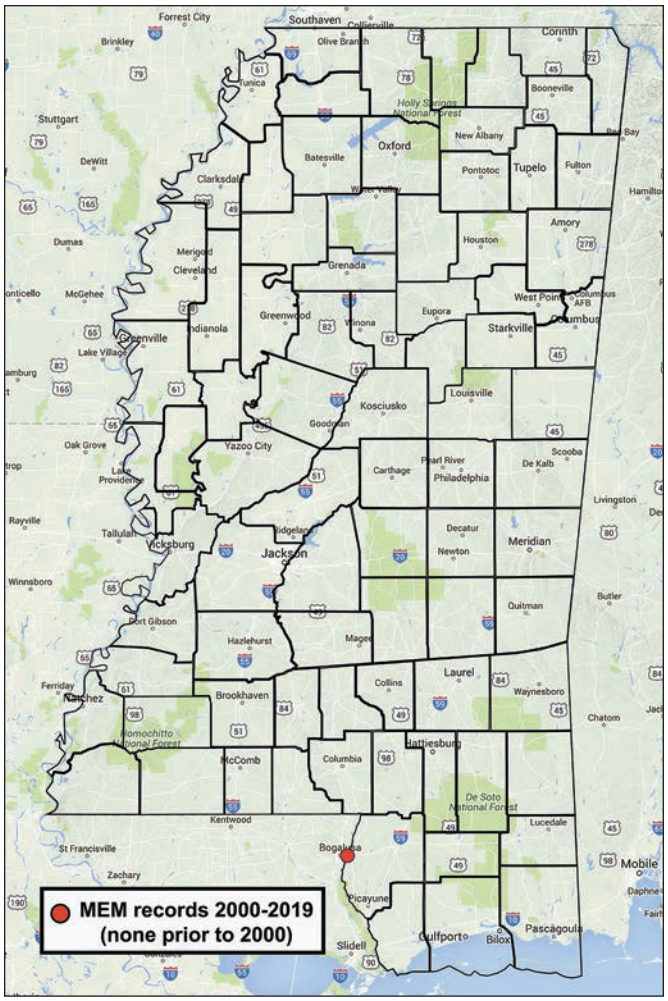
Description

Worker (Figure 17): Small (HL 1.04–1.09 mm, HW 0.91-0.96 mm, SL 0.97–0.99 mm, EL 0.17–0.19 mm, MeSL 1.44–1.48 mm) (n=5, MEM specimens). Head and body blackish-brown, funiculus, mandibles, and legs reddish-brown. Head longer than wide, with dense, appressed fine setae and scattered longer semierect setae; eyes small, located on the anterior 1/4 of the head; antenna 12-segmented; mandibles large, triangular, with 8–10 teeth. Promesonotum rounded and elevated above propodeum; mesosomal dorsum with dense, fine pubescence and scattered, longer, erect setae; mesopleura lacking pubescence, shiny; hind tibia with one large, pectinate spur and one small, simple spur. Waist with a single erect stout node; subpetiolar process with a distinct, acutely angled projection. Gaster elongate and cylindrical with dense, appressed pubescence and scattered, longer erect setae; prominent sting present at apex.

Queen (Figure 18): Larger than worker (HL 1.10–1.12 mm, HW 0.94–0.99 mm, SL 0.98–1.00 mm, EL 0.29–0.30 mm, MeSL 1.58–1.72 mm) (n=5, MEM specimens). Head and body blackish-brown, funiculus, mandibles, and legs reddish-brown. Head longer than wide, with dense, appressed setae and scattered longer semierect setae; eyes large, located near mandible base; three ocelli present; frontal lobes prominent and covering the antennal insertion point; antennae 12-segmented; mandibles large, triangular, with 8–10 teeth. Mesosoma entire, enlarged with four wings or wing scars; dorsum somewhat dulled beneath pubescence, mesopleura glabrous and shining; dorsum with dense, appressed pubescence and scattered, longer erect setae; propodeum flattened dorsally, rounded at junction of declivity, declivity sharply angled; hind tibia with one large, pectinate spur and one small, simple spur. Wings with strong venation; forewing with two submarginal cells, a discal cell, and pterostigma; hindwing with closed basal cell. Waist with a single petiolar node that narrows apically; subpetiolar process with a distinct, acutely angled projection. Gaster elongate and cylin-

drical with dense, appressed pubescence and scattered, longer erect setae; prominent sting present at apex.

Male (Figure 19): Slightly smaller than worker (HL 0.66–0.71 mm, HW 0.61–0.64 mm, SL 0.17–0.18 mm, EL 0.28–0.31 mm, MeSL, 1.42–1.53 mm) (n=4, MEM specimens). Head, scape, pronotum, mesopleura, and apical portion of gaster yellowish-brown; funiculus, propodeum, petiole, and anterior half or more of gaster dark brown; mesoscutum and legs pale yellow. Head small, ovoid, longer than wide, with dense, appressed setae and scattered longer semierect setae; eyes large; ocelli present; mandibles reduced and indistinct with the rest of the mouthparts conspicuous; antennae 13-segmented; antennal scape about twice the length of the first funicular segment but slightly shorter than the rest of the antennal segments; mandibles simple, reduced. Mesosoma entire, elongate and somewhat narrowed; pronotum, mesoscutum, mesoscutellum, and mesopleura lacking sculpture, smooth, and shining; propodeum with strong transverse striae; anepisternum and katepisternum separated by strong suture; propodeum lacking spines. Wings with strong venation; forewing with two submarginal cells, a discal cell, and pterostigma; hindwing with closed basal cell. Waist single-segmented with short and long erect setae; node roughly triangular in lateral view, broadly rounded apically; subpetiolar process distinct with an acute tooth. Gaster with dense, appressed pubescence and scattered, longer erect setae; apical gastral sternite coming to a distinct point, almost like a sting.



Map 4. *Brachyponera chinensis* site records in Mississippi based on MEM specimens.

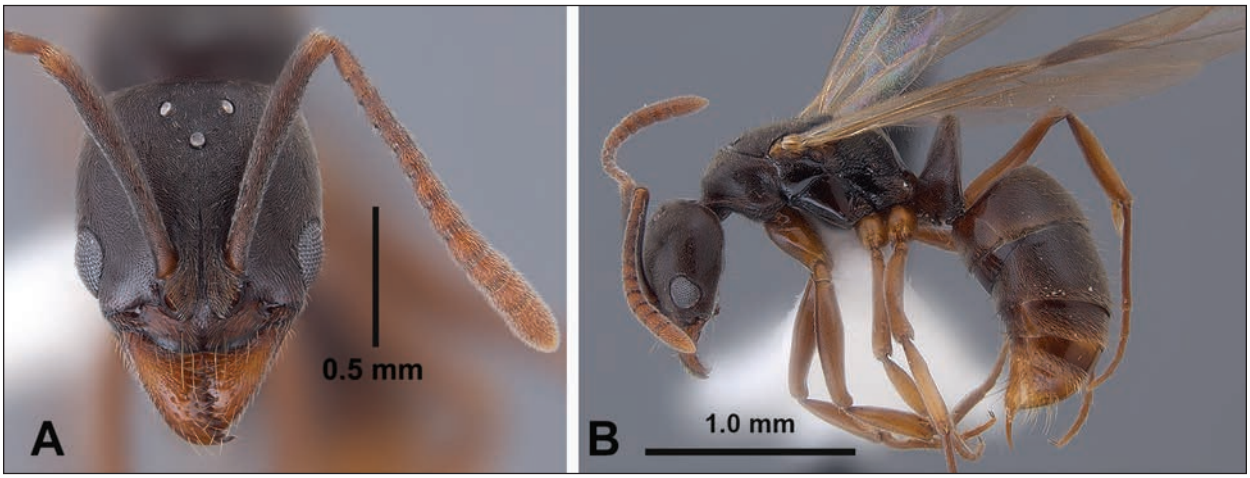


Figure 18. *Brachyponera chinensis* queen (A) full face view and (B) lateral view.

Biology

Brachyponera chinensis nests in soil (often in somewhat damp areas), especially below stones, in rotting logs and stumps, or in other debris. In urban settings, it 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 introduced, invasive ant species, this species may nest in natural wooded habitats. The Asian needle ant appears to prefer termites as a food source (Bednar and Silverman 2011).

Pest Status

The Asian needle ant is an invasive species that establishes large populations and may displace native species. Reactions in humans from the sting of this exotic species 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. However, it is not overly aggressive. Stings typically result from handling workers or by alate queens landing on individuals and becoming trapped between clothing layers and skin.

Distribution

Brachyponera chinensis is native to Asia, probably Japan from where it was introduced into the U.S. (Yashiro et al. 2010). It has been reported in the U.S. from Alabama, Arkansas, Connecticut, Florida, Georgia, Kentucky, Mississippi, North Carolina, New York, South Carolina, Tennessee, Texas, Virginia, Washington, and Wisconsin (Guérnard et al. 2019). In Mississippi, the MEM has only collected this species in Pearl River County (Map 4).

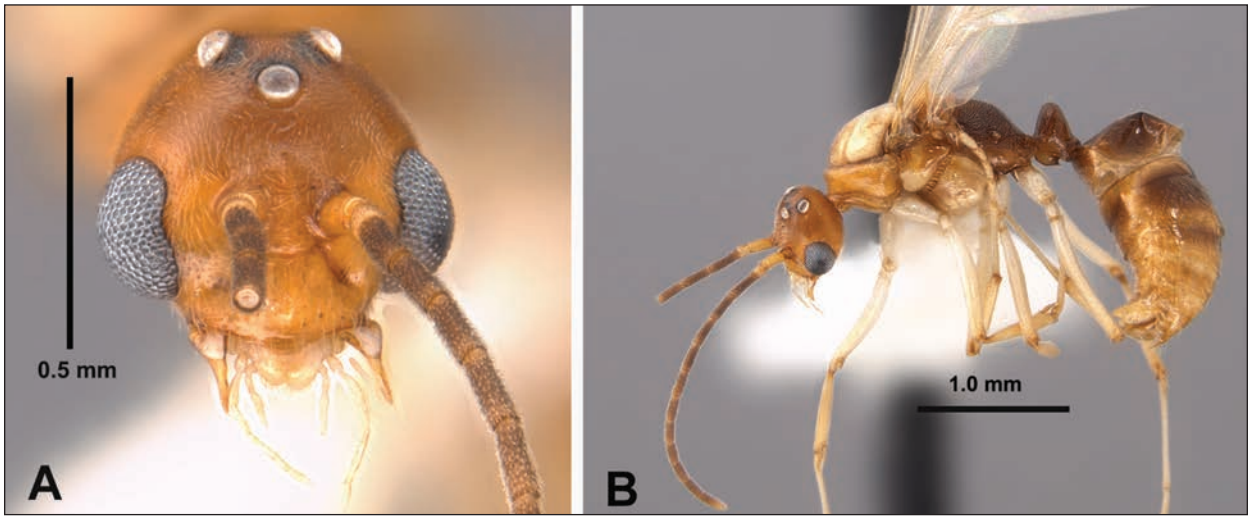


Figure 19. *Brachyponera chinensis* male (A) full face view and (B) lateral view.

Camponotus planatus Roger, 1863 — "compact carpenter ant"

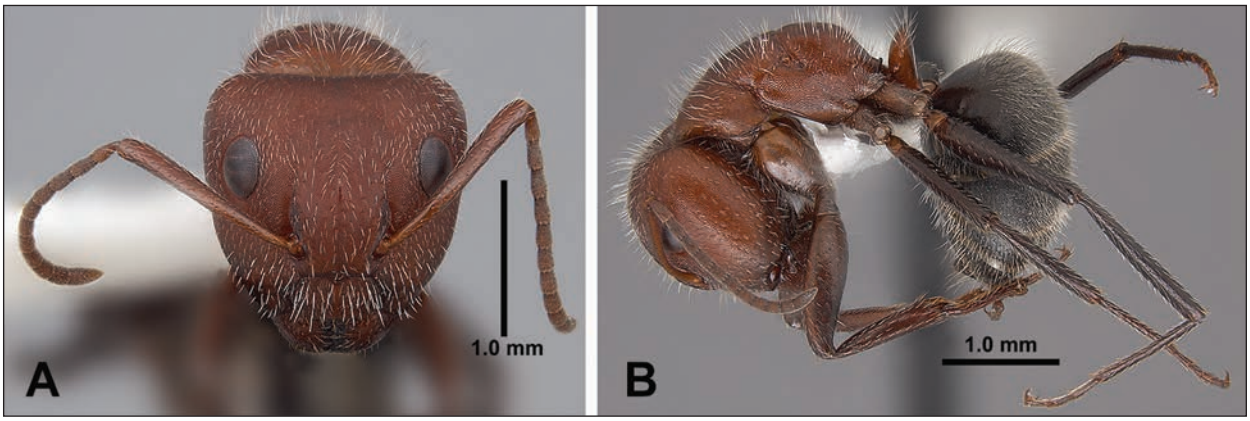


Figure 20. *Camponotus planatus* major worker (A) full face view and (B) lateral view.

Summary

Camponotus planatus Roger (Formicinae) is a medium-sized, bicolored species that has been reported to be native to the Caribbean, Mexico, Central America, and northern South America (Wetterer and Wetterer 2003). This tropical species occurs in Cuba and from Mexico to Colombia, southern Texas, New Mexico, southern Florida, (especially the Keys), and Mississippi (Antweb 2020). The earliest Mississippi record for this species is 2010 (MacGown 2010) from collections made at an outdoor palm nursery in Hancock County. Since then, this species appears to have become established in that region but has not been reported from other counties in the state.

Diagnosis

Camponotus planatus is easily distinguished from other species in the Southeast by its small size as compared to other carpenter ants (TL ≈ 3.5–6.0 mm, bicoloration [reddish-brown except for dark blackish-brown gaster], strongly arched mesosoma, lack of spines, single petiolar node, and abundant, elongate, white setae that cover much of the body except for the scapes. The strong pilosity and small size will separate *C. planatus* from most other bicolored carpenter ants in our region except for *C. floridanus,* which is larger, has black scapes, and has erect setae present on the scapes.

Descriptions

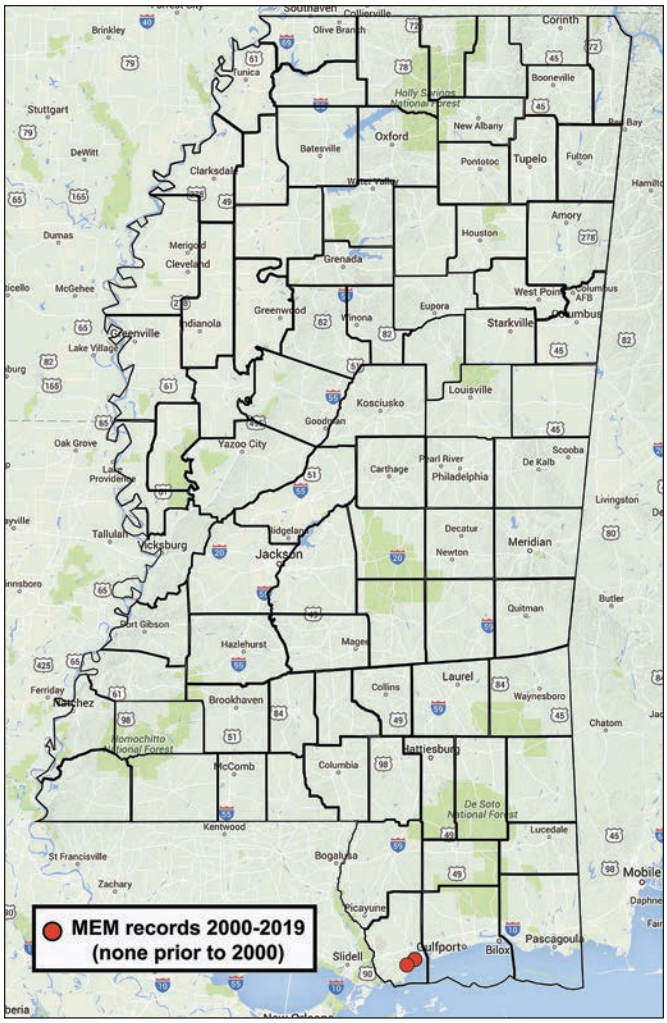
Major worker (Figure 20): Small (HL 1.76–1.84 mm, HW 1.84–1.94 mm, SL 1.38–1.44 mm, EL 0.47–0.50 mm, MeSL 1.76–1.87 mm) (n=5, MEM specimens). Head, mesosoma, waist, and forelegs reddish-brown, gaster and mid and hindlegs blackish. Head slightly wider than long, widest posteriorly, squarish; integument finely punctate, not shiny, with abundant short, stout, appressed, white pubescence present, long, erect white setae present except on scapes, which lack erect setae; eyes located above the midline of head; antennae 12-segmented, lacking club, scapes barely surpass the posterior border of head; clypeus convex, with weak median carina, anterior border weakly sinuate; mandibles stout, shiny, coarsely punctate, with six teeth. Mesosomal dorsum strongly and evenly curved; integument finely punctate, not shiny; entire mesosomal dorsum with abundant short, stout, appressed white pubescence, and abundant long, erect white setae present; pronotal humeral area broadened, flattened in dorsal view; propodeum lacking adornment, broadly rounded at junction of dorsum and declivity, declivity slightly concave. Waist with single, erect petiolar node, widening apically (as seen from front to back); shiny, with numerous, long, white setae. Gaster with fine microsculpture, not shining, with dense, appressed white pubescence and abundant, long, semierect whitish setae; acidopore present.

Minor worker (Figure 21): Smaller than major worker (HL 1.12–1.28 mm, HW 1.05–1.22 mm, SL 1.20–1.28 mm, EL 0.35–0.38 mm, MeSL 1.40–1.48 mm) (n=5, MEM specimens). Similar to major workers in coloration and other physical characteristic, but smaller, with less "squared" head shape, and with scapes surpassing posterior border of head by about half their length.

Queen (Figure 22): Slightly larger than workers (HL 1.26 mm, HW 1.26 mm, SL 1.1 mm, EL 0.42 mm, MeSL 2.16 mm) (n=1, MEM specimen). Head about as long as wide, widest posteriorly; coloration similar to workers; integument finely punctate, not shiny, with

abundant short, stout, appressed white pubescence, and abundant long, erect, white setae present except on scapes, which lack erect setae; eyes large, located near posterior edge of head and extending past edges of head in full face view; three ocelli present; antennae 12-segmented, lacking club, scapes barely surpass the posterior border of head; clypeus convex, with weak median carina, anterior border weakly sinuate; mandibles stout, shiny, coarsely punctate, with six teeth. Mesosomal dorsum enlarged, rounded flattened dorsally, with wing scars or wings present; integument finely punctate, not shiny; entire mesosomal dorsum with abundant short, stout, appressed white pubescence, and abundant long, erect white setae present; propodeum lacking adornment, broadly rounded at junction of dorsum and declivity, declivity slightly concave. Forewing with two submarginal cells; hindwing with simpler venation, basal cell present. Waist with single, erect petiolar node, widening apically (as seen from front to back); shiny, with numerous, long, white setae. Gaster with fine microsculpture, not shining, with dense, appressed, white pubescence and abundant, long, semi-erect, whitish setae; acidopore present.

Male (Description from Wheeler 1910; specimens not available for study): About the size of a worker (TL 4.5–5.0 mm). Head slightly longer than broad. Color overall black; mandibles, mouthparts, tarsi, genitalia, and articulations of legs and mesosoma brownish. Entire body subopaque, finely shagreened or punctate. Pilosity on body similar to that of worker minor, but less abundant, except scape, which lacks erect setae, cheeks with



Map 5. *Camponotus planatus* site records in Mississippi based on MEM specimens.

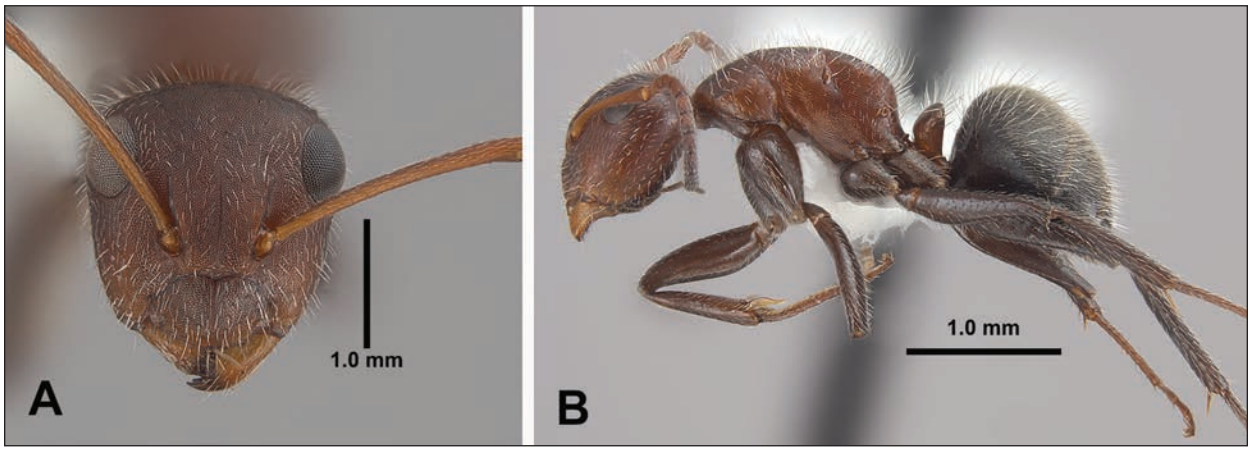


Figure 21. *Camponotus planatus* minor worker (A) full face view and (B) lateral view.

a few blunt, erect setae; legs with short, subappressed setae; gaster with long, conspicuous setae; pubescence apparently absent. Eyes large; ocelli presents; posterior border of head broadly rounded; cheeks subparallel, straight, somewhat shorter than the eyes; clypeus convex, bluntly carinate, with somewhat projecting, rounded and entire anterior margin; antennae slender, first funicular joint swollen, longer than the second segment; mandibles edentate. Mesosoma robust, with convex, rounded propodeum, without distinct basal and declivous surfaces. Wings similar to the female but with paler veins. Waist with a single node; petiole low, thick and transverse, with rather sharp, entire dorsal border.

Biology

According to Deyruyp et al. (2000), colonies are small and typically arboreal, and nests may be in places such as hollow twigs, old termite galleries in dead wood, grass clumps, voids in tree trunks, and leaf axil bases in palms. This species may be a significant competitor of native ants and predator of other arthropods, and it has been reported to protect honeydew-producing insects (Deyrup et al. 2000).

Pest Status

In isolated locations in Hancock County, Mississippi, *C. planatus* has proven difficult to control and is considered a significant pest.

Distribution

Camponotus planatus is native to Central America and northern South America. In the U.S., it has been reported from Florida, Mississippi, New Mexico, and Texas. All records in Mississippi are from Hancock County, where it appears to be well established (MacGown 2010) (Map 5).

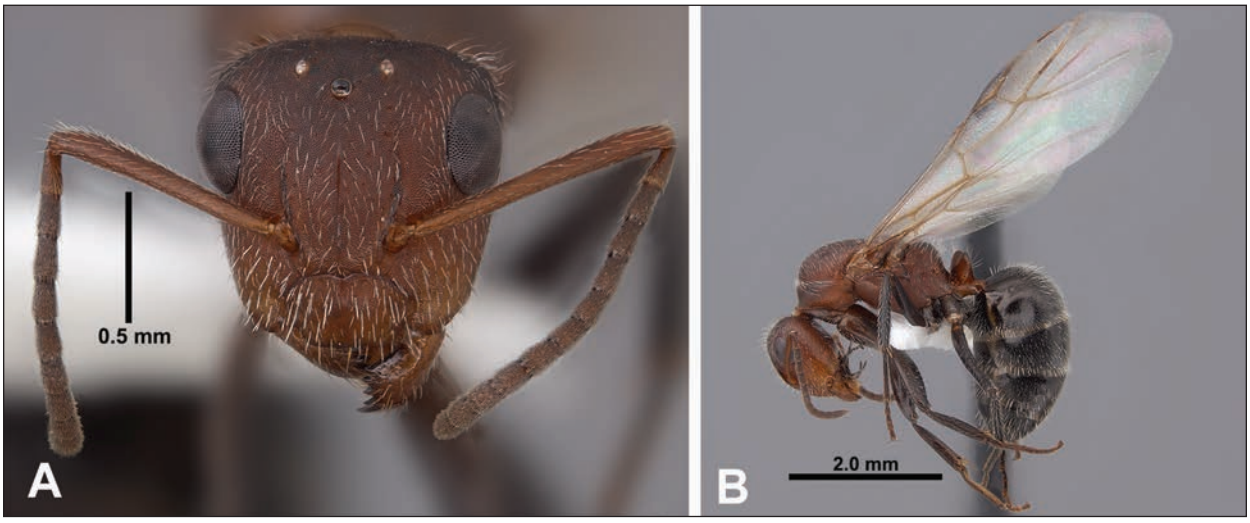


Figure 22. *Camponotus planatus* alate queen (A) full face view and (B) lateral view.

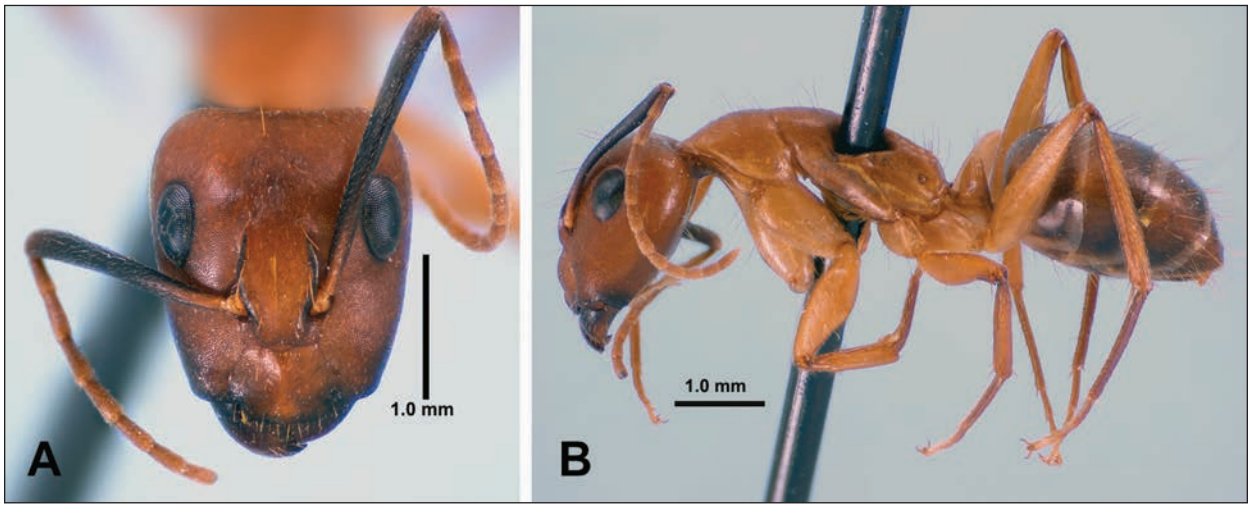


Figure 23. *Camponotus* cf. *tortuganus* major worker (A) full face view and (B) lateral view.

Summary

Camponotus cf. *tortuganus* Emery (Formicinae) is a large, bicolored species in the subgenus *Tanaemyrmex* and is thought to be native to the Bahamas and other islands in the Caribbean region (Wetterer and O'Hara 2002). In the U.S., it is only been recorded from Florida (Deyrup et al. 2000) and more recently coastal Mississippi, where it was first collected in 2009. Its status in Florida as an exotic species is unclear, but it is likely exotic to Mississippi.

Taxonomic Status

The taxonomy and identity of U.S. specimens identified as *C. tortuganus* is unresolved. Historically, from as early as 1923, specimens collected from Florida have been identified as *C. tortuganus,* a species considered to occur in the Dry Tortugas (Deyrup 2017). Wetterer and O'Hara (2002) wrote that Emery's description of *C. tortuganus* erroneously attributed the type locality as the Dry Tortugas, when in fact it should have been the Bahamas based on label data. In this same paper, Wetterer and O'Hara used the name of *C. zonatus* Emery 1894 for "*C. tortuganus*" like specimens that they collected in the Dry Tortugas. Further, they mentioned that, based on personal communications from William MacKay, Florida species were all likely *C. zonatus* as well. Deyrup (2017) wrote that from 1965 onward, some specimens were collected in Florida that resembled both *C. tortuganus* and a related species *C. inaequalis* Roger, 1863, with some of those specimens showing intermediate coloration between the two. Moreau et al (2014) commented that *C. tortuganus* could be a red and black form of *C. inaequalis,* but because they only found the red and black form in the Keys, they only listed *C. tortuganus* as being present there. The authors also speculated that *C. tortuganus* might be a Florida native. Due to the confusion, Deyrup (2017) referred to all *C. tortuganus*-like specimens from Florida as *C. inaequalis,* the oldest name, and he listed *C. tortuganus* as a probable junior synonym of *C. inaequalis.* Recent updates to Antcat.org list both *C. inaequalis* and *C. zonatus* as subspecies of *C. conspicuus*. *Camponotus conspicuus inaequalis* was described from Cuban specimens, and *C. conspicuus zonatus* was described from specimens from Costa Rica. This taxonomic puzzle is larger than the scope of this bulletin, and thus, we use the widely used name *C. tortuganus* for specimens that we collected in Mississippi but add cf. before the species name to acknowledge that the identity of this species is in question.

Diagnosis

Camponotus cf. *tortuganus* is a large (TL ≈ 6.5-10.0 mm) bicolored reddish-brown and blackish species with a narrow head (in full face view), scattered long, semi-erect setae on the body and a few shorter erect setae on posterior portion of head, and typical formicine characteristics including a single petiolar node and an acidopore. It can be distinguished from other carpenter ant species in our region by the color, overall shiny appearance, median carina on the clypeus, numerous long erect setae on the body, and lacking or having only sparse erect setae on posterior corners of the head. In our

region, *C.* cf. *tortuganus* is most similar to *C. socius,* which differs by being opaque, having a reddish orange and black-patterned gaster, and having numerous erect setae on the posterior portion of the head.

Descriptions

Major worker (Figure 23): Large (HL 2.16–2.30 mm, HW 1.76–1.92 mm, SL 2.00 mm, EL 0.50–0.54 mm, MeSL 3.20–3.28 mm) (n=5, MEM specimens). Bicolored: head dark reddish-brown, scapes mostly black, funiculi reddish-brown; mesosoma, waist, and legs orangish-brown; and gaster dark reddish-brown to brownish-black, sometimes with infuscation or with lighter striped areas at posterior edges of gastral tergites. Head longer than wide, widest posteriorly, posterior border shallowly concave; entire head with fine microtexture giving it a matte appearance, with sparse, short pubescence, a few longer, erect setae at posterior corners, erect setae lacking on cheeks; eyes large, placed above midline of head; antennae 12-segmented lacking club; clypeus with a sharp and well-defined median carina present, anterior clypeal margin entire; scape less than length of the head. Mesosoma smoothly arched in lateral view, shiny, with sparse pubescence dorsally and numerous long, semierect, curved setae; propodeal declivity slightly concave, propodeum lacking adornment. Waist with a single erect petiolar node; node wider at base than apex, convex anteriorly and relatively straight on posterior side; shiny with long, erect setae apically. Gaster shiny, with sparse, appressed pubescence and numerous elongate, semierect, curved setae; acidopore present.

Minor worker (Figure 24): Large (HL 01.66–1.80 mm, HW 1.18–1.2 2 mm, SL 2.20 mm, EL 0.5 mm, MeSL 2.80–2.90 mm) (n=5, MEM specimens). Bicolored: head, mesosoma, waist, legs, and antennae orangish-brown and gaster dark reddish-brown to brownish-black (sometimes with lighter striped areas at posterior edges of gastral tergites). Head much longer then wide, giving it a narrowed appearance; shiny, mostly lacking sculpture, with scattered short, appressed pubescence; head with several stiff, erect setae present at posterior corners, cheeks lacking erect setae, clypeal face with several erect setae; antennae 12-segmented lacking club; antennal scapes lacking erect setae; eyes large, anterior edge of eye beginning at approximately the halfway point of head; scape longer than head length; clypeus with a sharp and well-defined median carina present, anterior clypeal margin entire. Mesosoma smoothly arched in lateral view, with fine microsculpture, but mostly shiny; sparse pubescence present dorsally; several long, semierect, curved setae present dorsally; propodeum lacking adornment. Waist with a single, erect petiolar node; node wider at base than apex, convex anteriorly and relatively straight on posterior side; shiny with long erect setae apically. Gaster shiny, with sparse, appressed pubescence and numerous elongate, semierect, curved setae; acidopore present.

Queen (From description of *C. tortuganus* provided by Wheeler, 1910): Large (TL ≈ 10.0–11.0 mm; FWL 11.0 mm). Resembling the major worker in sculpture, pilosity, and color. Head proportionately longer. Eyes large and convex. Mesosoma as broad as the head, rather depressed; propodeum with indistinct base and declivity, the former fully as long as the latter; propodeum lacking adornment. Petiole similar to that of the major worker. Forewing with amber coloration, especially along top third of wing; veins and stigma pale brownish-yellow; costal, submarginal, marginal, basal, and subbasal cells closed; discal cell absent.

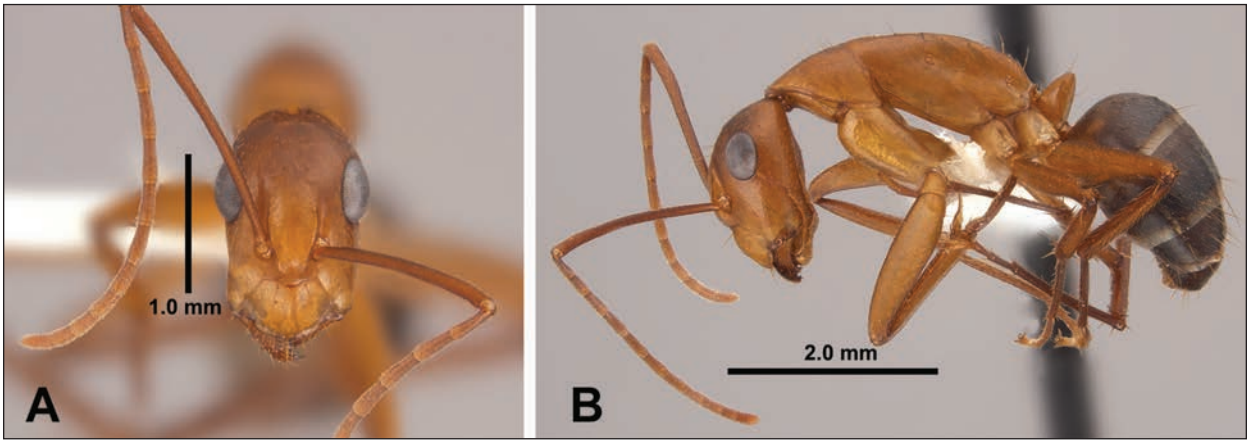


Figure 24. *Camponotus* cf. *tortuganus* minor worker (A) full face view and (B) lateral view.

Male (From description of *C. tortuganus* provided by Wheeler, 1910): (TL ≈ 7.0 mm). Head about as wide as long (including eyes). Eyes and ocelli very large. Cheeks much shorter than the eyes, straight and parallel. Posterior portion of head broad and rounded. Clypeus subcarinate, with broadly rounded, projecting anterior border. Mandibles narrow, edentate. Antennae slender, first funicular joint as long as the second, distinctly incrassated. Mesosoma robust, with low, evenly rounded propodeum; its base and declivity indistinctly differentiated, the former about twice as long as the latter. Petiole longer than high, with a low, thick, transverse node. Gaster and legs slender.

Biology

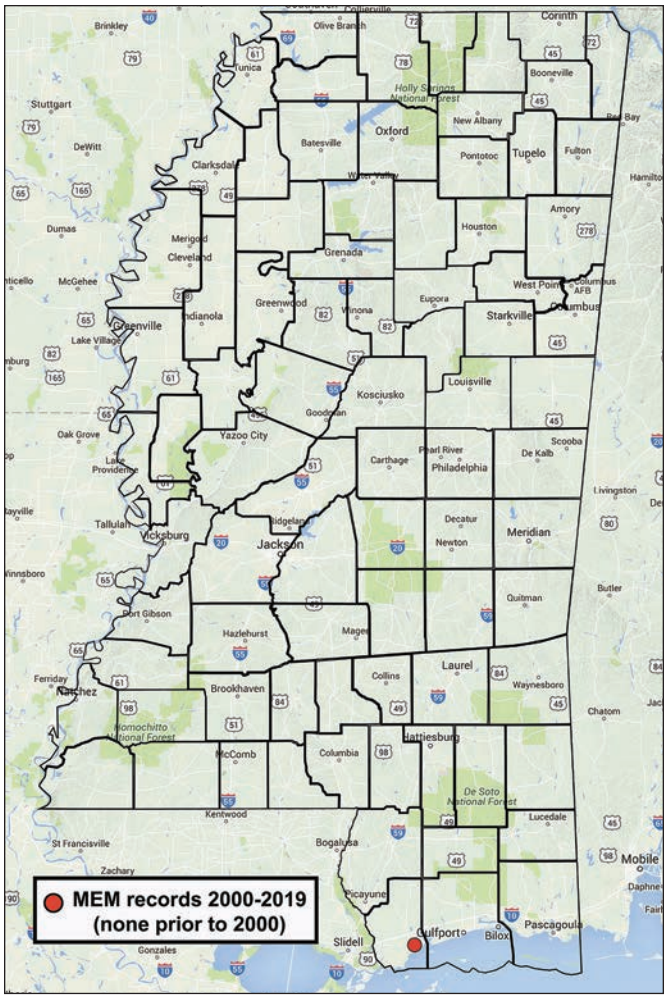
Workers from Mississippi were collected as they foraged along irrigation hoses at an outdoor palm nursery. This particular nursery was known for importing palms from southern Florida, and we suspect that the ants were introduced in a plant shipment. In Florida, this species occurs on beaches, in scrub habitat, and in disturbed areas. Nests are typically found under objects and in structures.

Pest Status

Currently, *C.* cf. *tortuganus* is not considered to be a serious economic threat.

Distribution

Camponotus tortuganus was erroneously thought to have been described from the Dry Tortugas. However, the holotype is known now to have been collected in the Bahamas (Wetterer and O'Hara 2002). Due to confusion about its identity, exact distributional data is unclear. In the U.S., this species (our concept of this species) has only been reported from Florida and Mississippi (Hancock County, MEM) (Map 6).



Map 6. *Camponotus* cf. *tortuganus* site records in Mississippi based on MEM specimens.

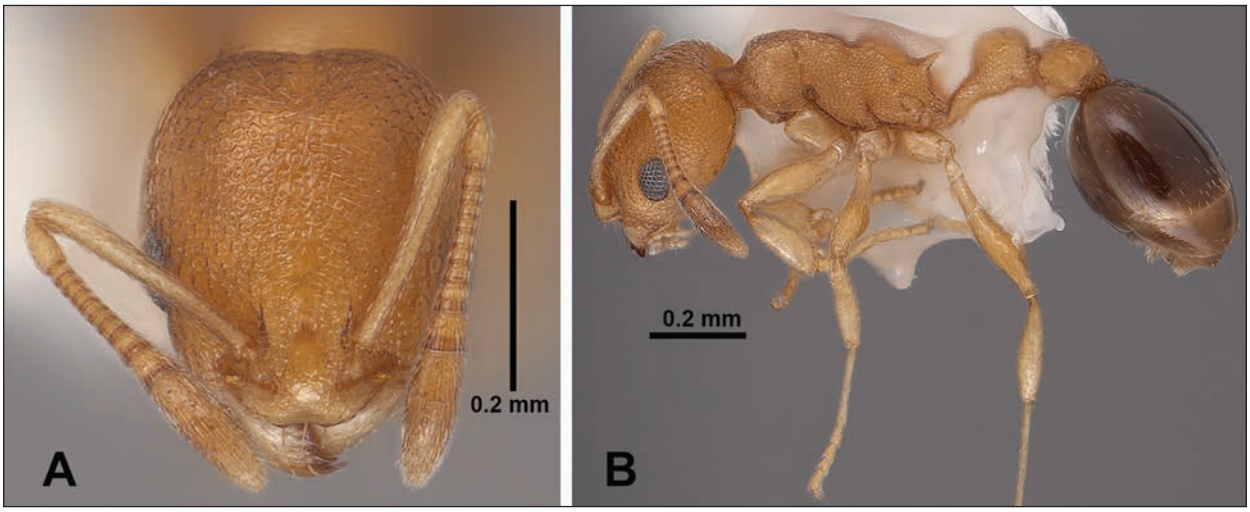


Figure 25. ***Cardiocondyla wroughtonii*** **worker (A) full face view and (B) lateral view.**

Summary

Cardiocondyla wroughtonii (Forel) (Myrmicinae) is a tiny, yellow tramp ant that can be found worldwide (Antmaps.org). It is not considered to be a pest, nor has it been shown to have negative environmental effects. This species has only been collected in three southern counties in Mississippi and does not appear to be well established in Mississippi.

Diagnosis

Workers of *C. wroughtonii* can be recognized by their small size (TL ≈ 1.67–1.75 mm), yellowish color, the clypeus being flattened and projecting over mandible, somewhat enlarged apical funicular segment, lack of long erect setae on the head and body, and presence of propodeal spines. Some minor workers of *Pheidole* are similar in appearance but differ by the clypeus not being flattened and usually having erect setae on the body. *Temnothorax* species in this region differ by having distinct pilosity present on the dorsum of the body. *Cardiocondyla wroughtonii* can be differentiated from the other four species of *Cardiocondyla* reported from the Southeast by its color, which is predominately yellowish-brown except gaster, which may be dark brown, a distinct metanotal groove, relatively short antennal scapes; and relatively long propodeal spines.

Descriptions

Worker (Figure 25): Minute (HL 0.45–0.49 mm, HW 0.35–0.40 mm, SL 0.32–0.36 mm, EL 0.10–0.11 mm, MeSL 0.49–0.52 mm) (n=5, MEM specimens). Light yellowish-brown with the first gastral tergite brown to dark brown. Head slightly longer than wide, with large shallow, tightly interwoven foveolate reticulation; with scattered, short, appressed pubescence; erect setae absent; eyes large, located on sides of head just below midline of the head; antennal scape does not reach the occipital border; antennae 12-segmented with three-segmented club; clypeus flattened with lateral portions projecting outward; anterior clypeal margin with a long seta projecting over the mandibles; mandibles with five teeth. Mesosoma with dense, shallow, foveolate reticulation; lacking conspicuous setae; mesonotum relatively flat; promesonotal suture weak; metanotal groove deeply impressed; propodeum armed with a stout spine on either side; propodeal spines similar in length to the distance between their bases. Waist two-segmented, with fine, appressed pubescence, lacking erect setae; petiole, squarish in profile, with a ventral, median process, with foveolate reticulation; postpetiole circular (in lateral view), mostly shiny, with a medial, lateral notch or concave impression on the anterior margin in the lateral view. Gaster shiny with a few, short appressed setae; apex with a small cluster of setae; sting present.

Queen (Figure 26): Minute, slightly larger than workers (HL 0.51–0.53 mm, HW 0.41–0.44 mm, SL 0.35–0.36 mm, EL 0.12–0.13 mm, MeSL 0.63–0.69 mm) (n=5, MEM specimens). Yellowish-brown with a brown band on the first gastral tergite remainder of the gaster slightly darker than the body. Head longer than wide, with large shallow, tightly interwoven foveolate reticulation; with scattered, short, appressed pubes-

cence; eyes large, located on sides of head just below midline of the head; three small ocelli present, occasionally with dark pigmentation around their bases; mandibles with five teeth; clypeus distinctly raised above the surrounding areas; scapes not reaching the occipital border; antennae 12-segmented with a three-segmented club. Mesosoma, enlarged with four wings or wing scars, with shallow foveolate reticulation; scattered, fine, appressed pubescence; longer, erect setae lacking; propodeum with a stout spine on each side; spines about as long as the width between their bases. Wings simple, lacking closed cell. Waist two-segmented, with fine, appressed pubescence, lacking erect setae; petiole, squarish in profile, with a ventral, median process, with foveolate reticulation; postpetiole circular (in lateral view), mostly shiny, with a medial, lateral notch or concave impression on the anterior margin in the lateral view. Gaster shiny with a few, short appressed setae; apex with a small cluster of setae; sting present.

Wingless male (Specimens not available for study, description from Kugler (1984)): Minute, approximately the same size as worker (TL 1.7 mm, HL 0.35 m, HW 0.32 mm). Color yellow with gaster light to dark brown. Head slightly longer than wide, narrowing anteriorly; posterior margin nearly straight with rounded corners; eyes smaller than in worker, nearly circular, diameter about 1/7 the length of head; antenna 11-segmented, funicular segments except first and last wider than long, last segment thick and long (club-like); clypeus excavated in middle with two carinae; mandibles long, distally curving, narrowing, pointed, and toothless. Mesosoma lacking obvious sutures dorsally; pronotum with developed humeri; mesonotum with a lateral triangular protuberance on each side; propodeum with short blunt teeth. Waist two-segmented; petiolar node longer than wide; postpetiole about 1.5 times as wide as long.

Winged male (Specimens not available for study, description from Kugler [1984]): Minute, approximately the same size as worker (TL 1.8–2.0 mm, HL 0.38–0.44 m, HW 0.35–0.37 mm; SL 0.20–0.23 mm). Color yellow, head infuscated in part, opaque and granulose; gaster shining dark brown. Head slightly longer than wide; posterior margin convex; eyes located on anterior half of head, large, convex, nearly circular; antenna 13-segmented, scape slightly shorter than four basal funicular segments combined, all segments longer than wide, last segment nearly twice as long as penultimate segment; clypeus large, slightly compressed anteriomedially; frontal carina short; mandibles short, narrow, tapering, pointed distally, and lacking teeth. Mesosoma narrower at shoulders than at base of forewings; pronotum visible from above, humeral areas rounded but not protruding, lacking obvious sutures dorsally; mesonotum lacking lateral bulges; propodeum with two well-developed spines. Wings with reduced venation, radial cell lacking, cubital cell not clearly closed posteriorly. Waist two-segmented; petiole with peduncle longer than node, width of node in dorsal view equal to length, in profile dorsal margin nearly flat. Genitalia: minute, mostly concealed, tip of gonostylus visible in lateral view.

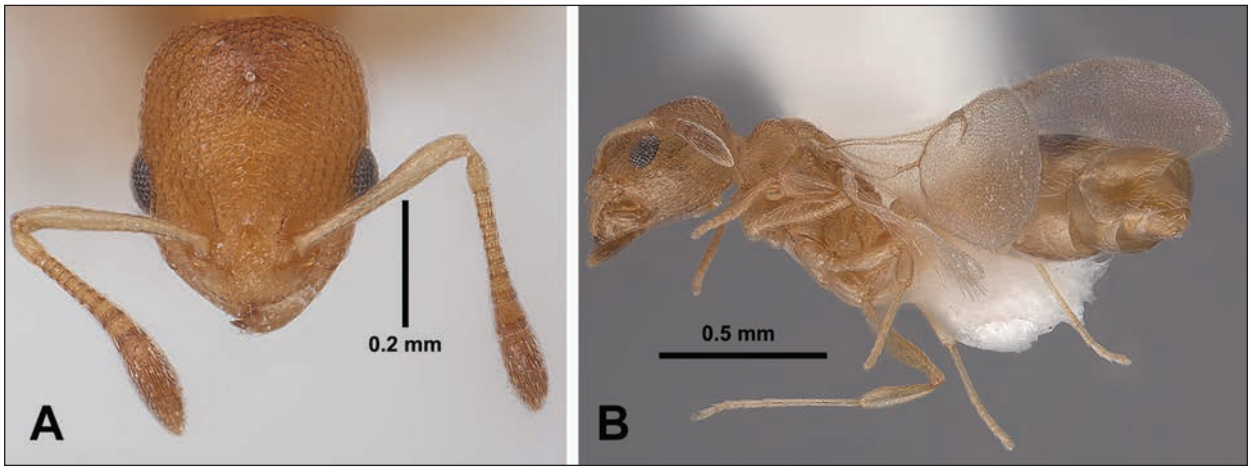


Figure 26. *Cardiocondyla wroughtonii* alate queen (A) full face view and (B) lateral view.

Biology

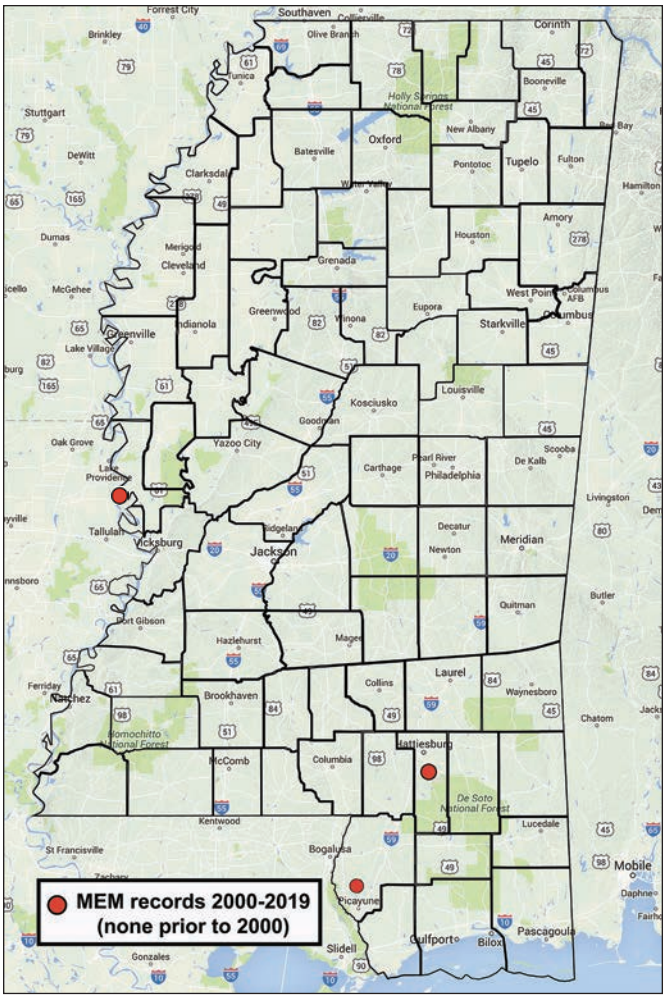
Cardiocondyla wroughtonii can be found around the world in tropical and subtropical environments. It has been reported to nest in hollow stems of dead grasses, in dead twigs on the ground, between layers of leaves, and in leaf litter (Antweb 2020). Not much is specifically known about the biology of *C. wroughtonii*, although it produces ergatoid males in addition to alate males and tends to have polygynous colonies, though monogynous ones have been seen (Kugler 1984).

Pest Status

Cardiocondyla wroughtonii is not considered to be a pest, and because so little is known about *C. wroughtonii*, any environmental impact it may have is currently unknown.

Distribution

The native range of *C. wroughtonii* is thought to be from the Old World tropics, likely southeastern Asia (AntWeb 2020). Records from the U.S. include Florida, Georgia, Hawaii, Louisiana, Mississippi, and Texas (AntWeb.org, AntWiki.org and MEM). In Mississippi, the MEM has specimens of this species in Forrest, Issaquena, and Pearl River Counties (Map 7).



Map 7. *Cardiocondyla wroughtonii* site records in Mississippi based on MEM specimens.

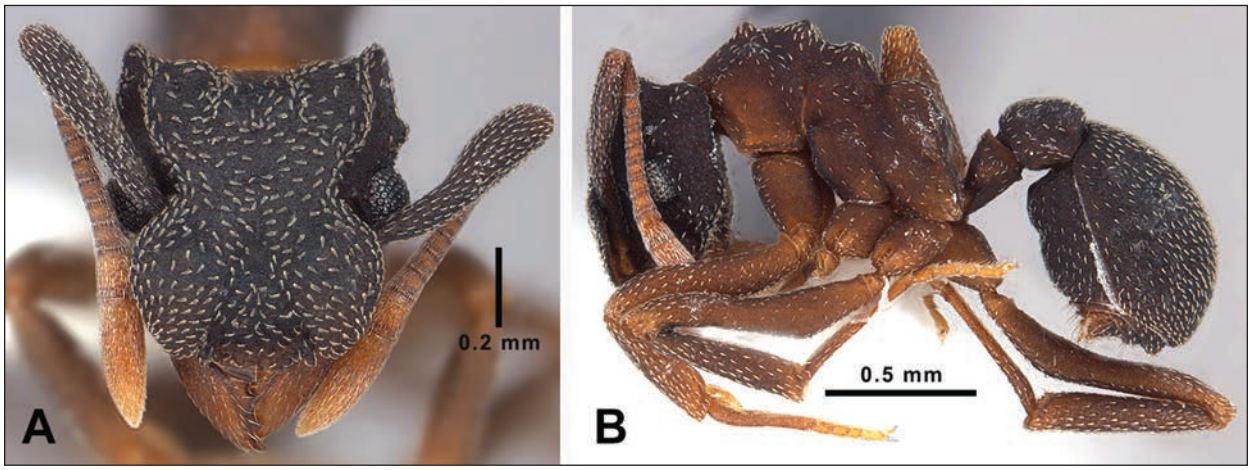


Figure 27. ***Cyphomyrmex rimosus*** **worker (A) full face view and (B) lateral view.**

Summary

Cyphomyrmex rimosus (Spinola) (Myrmicinae) is a small, dull brown to blackish-brown, fungus-growing ant native to the Neotropics (AntWeb 2020). This species is well established in the Southeast. We do not have a firm time as to when this species first appeared in Mississippi, but the earliest records in the MEM were specimens collected on the Gulf Coast in 1995. This species is now widespread throughout much of the southern half of the state.

Diagnosis

In the Southeast, workers of *Cyphomyrmex* can be easily distinguished from other genera by the unique head shape (Fig. 26A), dark coloration, short, compact size (TL ≈ 3.3–3.5 mm) with prominent rounded tubercles on mesosomal dorsum, and the flat, appressed scale-like setae on the head and body. *Cyphomyrmex rimosus* differs from *C. minutus,* the only other species in the genus reported from the U.S., by being generally larger and having appressed setae on the gaster closer together.

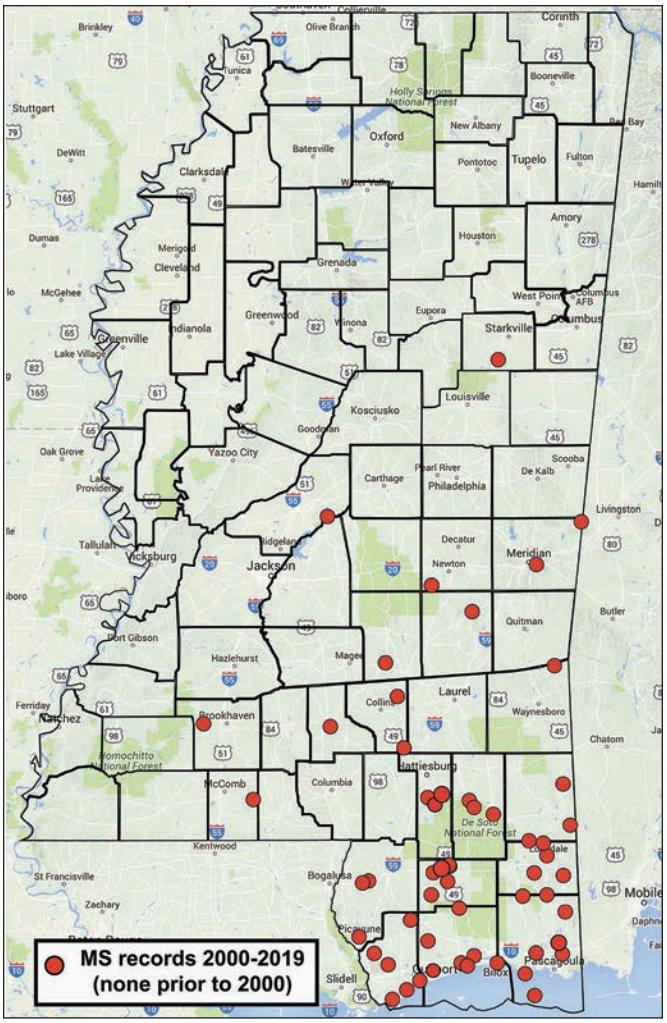
Descriptions

Worker (Figure 27): Small (HL 0.83–0.86 mm, HW 0.73–0.75 mm, SL 0.71–0.76 mm, EL 0.18–0.19 mm, MeSL 1.09–1.13 mm) (n=5, MEM specimens). Color brown to blackish-brown or bicolored with head and gaster dark brown to blackish and mesosoma reddish-brown, with legs and antennal funiculi often orangish-brown. Head with frontal lobes conspicuously expanded laterally, covering the antennal insertion points as well as much of the lower part of the head giving the face a notched appearance; deep antennal scrobes present, extending to posterior corners of head; opaque with fine granulate sculpture, entire surface often dulled with a whitish cast; numerous appressed scale-like setae present on head including clypeus; eyes well developed and located laterally below the antennal scrobes; antennae 11-segmented with two-segmented club: mandibles triangular with five teeth. Mesosomal dorsum with prominent rounded tubercles; matte in appearance; with sparse scale-like setae, especially on dorsum; propodeum lacking spines. Waist two-segmented; matte in appearance, with scattered scale-like setae present; petiole triangular-trapezoidal in lateral view; postpetiole enlarged, with a shallow, medial glabrous depression on the dorsal surface. Gaster with similar matte appearance as head and mesosoma, with fine granulation; numerous short, appressed, scale-like setae present; anterior edge of first tergite with glabrous, medial depression; first tergite enlarged to make up a majority of the gaster's size; sting present.

Queen (Figure 28): Small, slightly larger than workers (HL 0.86–0.89 mm, HW 0.78–0.81 mm, SL 0.72–0.75 mm, EL 0.22–0.23 mm, MeSL 1.20–1.27 mm) (n=5, MEM specimens). Head, mesosoma, waist and gaster light brown to blackish-brown or dusky gray with legs and antennae usually orangish-brown. Head with frontal lobes conspicuously expanded laterally, covering the antennal insertion points as well as much of the lower part of the head giving the face a notched appearance; deep antennal scrobes present, extending to posterior corners of head; entire head opaque with fine granulate sculpture, surface often dulled with a whitish cast; numerous appressed scale-like setae present on head

including clypeus; eyes well developed and located laterally below the antennal scrobes; small ocelli located on three tubercles placed dorsoposteriorly; antennae 11-segmented with a two-segmented club; mandibles triangular in shape with five teeth; lateral portions of clypeus raised, directed anteriorly. Mesosoma enlarged, rounded rectangular in lateral view; distinct humeral tubercles present; metanotum notched posteriorly and overhanging propodeum; mesoscutum and mesoscutellum forming a shelf overhanging wing bases; propodeum with small rounded spines; entire mesosoma with fine granulate sculpture, matte in appearance; with dense, short, appressed, scale-like setae present on dorsum, mostly lacking on pronotum, mesopleuron, and metapleuron; propodeum mostly lacking setae. Wings, when present, dusky grayish-brown; forewing with costal, basal, subbasal, submarginal, and marginal cell; medial vein extending to wing tip; pterostigma absent; hindwing venation simple with only the submarginal cell closed. Waist two-segmented, opaque, with appressed scale-like setae; petiole triangular-trapezoidal; postpetiolar node enlarged, in dorsal view hemispherical, with a shallow, medial depression on the dorsal surface; posterior margin of postpetiole with wide notch. Gaster opaque, with numerous appressed, scale-like setae; distinct, medial, glabrous depression present anterodorsally that lines up with postpetiolar medial depression; first tergite enlarged making up majority of the gaster's size; sting present.

Male (Figure 29): Small, about the size of workers (HL 0.66–0.70 mm, HW 0.58–0.61 mm, SL 0.81–0.84 mm, EL 0.26–0.28 mm, MeSL 1.20–1.27 mm) (n=5, MEM speci-



Map 8. *Cyphomyrmex rimosus* site records in Mississippi based on MEM specimens.

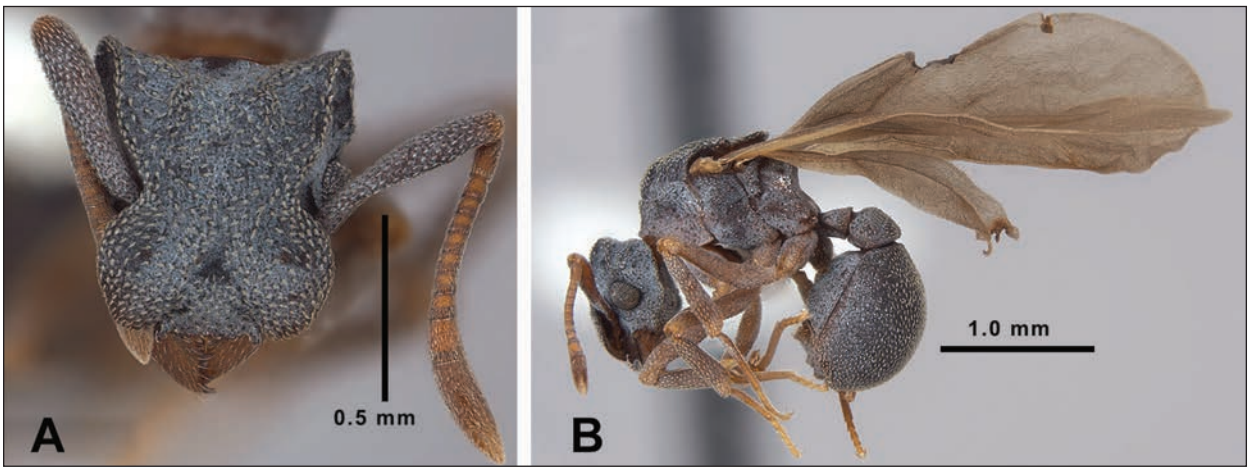


Figure 28. *Cyphomyrmex rimosus* alate queen (A) full face view and (B) lateral view.

mens). Color overall dark brown to brownish-black, legs dark orangish-brown. Head with frontal processes enlarged and distinctly projecting anteriorly; posterior edge of head flat with triangular tubercle at each posterior corner; strong carina curving between posterior corners of head and from posterior corners on sides of head to eyes; entire head with tight-knit reticulation, matte, with scattered, short, appressed, setae; frontal processes enlarged and distinctly projecting anteriorly; posterior edge of head flat with triangular tubercle at each posterior corner; eyes large, distinctly convex; three ocelli present on blunt tubercles; lateral edges of clypeus slightly raised; antennae 13-segmented; scape elongate, about as long as head length; last funicular segment elongated and more than twice the length of the preceding segment; mandibles triangular, with teeth. Mesosoma with roughened, matte appearance, with hair-like setae dorsally; two humeral tubercles present; posterior edge of metanotum notched, overhanging propodeum; mesocutum and mesoscutellum covering wing bases; propodeum with two denticle like projections. Wings grayish-brown; forewing with costal, basal, subbasal, submarginal, and marginal cell; medial vein extending to wing tip; pterostigma absent; hindwing venation simple with only the submarginal cell closed. Waist two-segmented; both nodes matte, with fine granulate sculpture; scattered, short appressed, thickened setae present; petiole with short anterior peduncle, node smoothly arched anteriorly and slightly raised posteriorly in profile view; postpetiolar node enlarged with a shallow, medial, glabrous depression. Gaster matte, with small, hair-like setae; faint, almost imperceptible anterior medial depression aligned with the postpetiolar depression, sometimes only visible as a flat area instead of being convex like the rest of the gaster; first tergite enlarged to make up a majority of the gaster's size; genitalia present at the apex with large parameres obvious.

Biology

The colony size of *C. rimosus* is typically small, with usually less than 100 workers, although colonies with more than 300 workers have been observed (Murakami and Higashi 1997). Colonies are typically monogynous but may be polygynous (Murakami and Higashi, 1997, Snelling and Longino 1992). Nests are often simple, shallow, impermanent structures under rocks, logs, dry cow manure, or any other surface. The species is very common in open habitats such as pastures and also in open woodlands such as longleaf pine forests. As with other Attine ants, *C. rimosus* cultivates subterranean fungus gardens, growing the fungus on a substrate of vegetable matter, insect frass, and dead insects (AntWiki 2020). *Cyphomyrmex rimosus* supplements its diet with nectar and the sap of plants (Murakami and Higashi 1997). The queens have been reported to practice monandry and semi-claustral nest founding (Mehdiabadi & Schultz, 2010).

Pest Status

This species is not considered to be a pest.

Distribution

The native range of *C. rimosus* is in the Neotropics. In the U.S., this species is well established in Alabama, Florida, Georgia, Louisiana, Mississippi, New Mexico, South Carolina, and Texas (AntWeb.org, AntWiki.org and MEM). MEM records from Mississippi include the following counties: Covington, Forrest, George, Greene, Hancock, Harrison, Jackson, Jasper, Jefferson Davis, Lauderdale, Lincoln, Madison, Newton, Oktibbeha, Pearl River, Perry, Pike, Smith, Stone, and Wayne (Map 8).

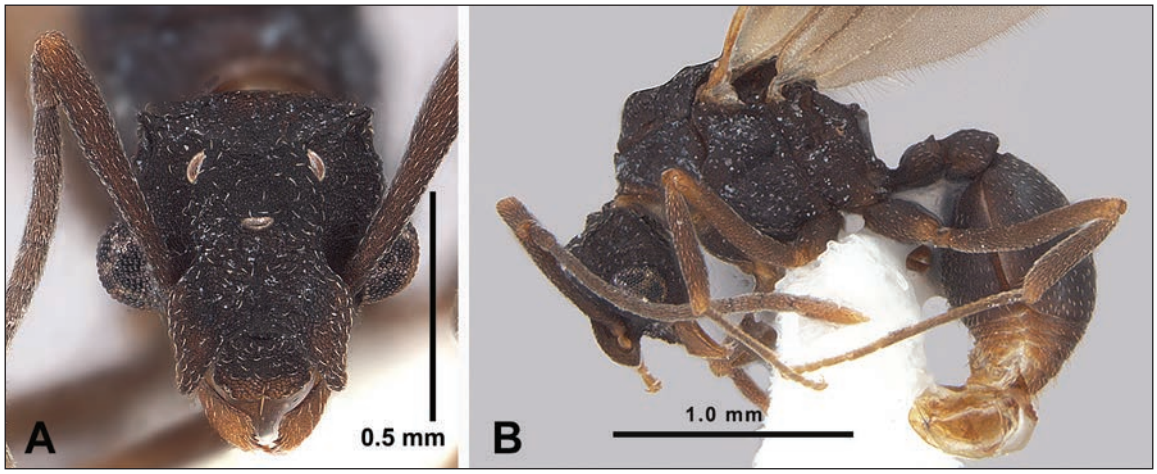


Figure 29. *Cyphomyrmex rimosus* male (A) full face view and (B) lateral view.

Gnamptogenys triangularis (Mayr, 1887) — "South American grooved ant"

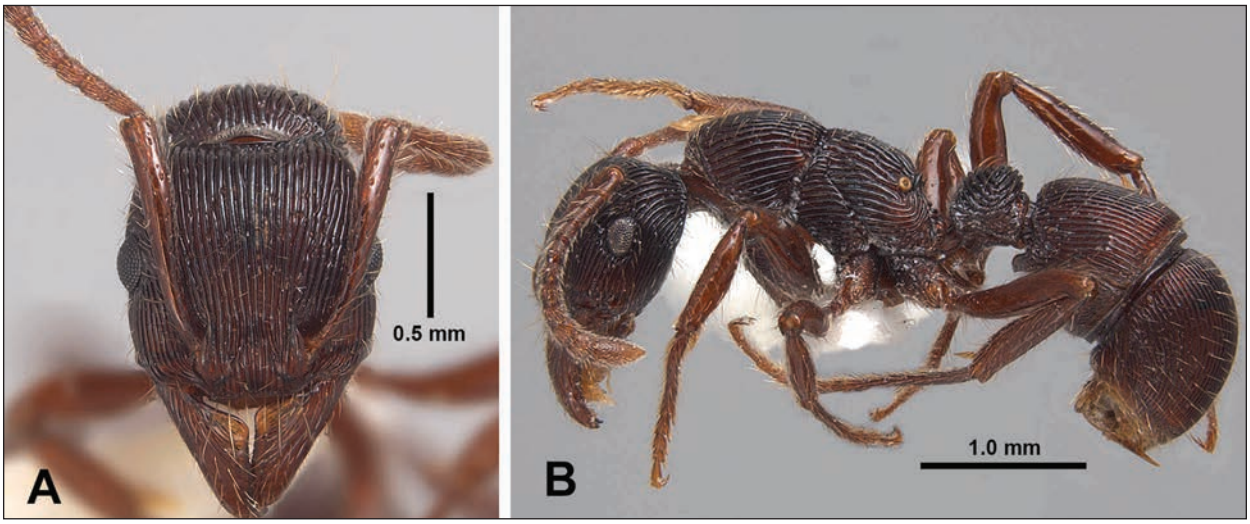


Figure 30. *Gnamptogenys triangularis* worker (A) full face view and (B) lateral view.

Summary

Gnamptogenys triangularis (Mayr) (Ectatomminae) is a medium-sized, dark-brown species with deep-grooved sculpturing on the entire body. The species was first reported in the U.S. in Florida in 1985 (Deyrup et al. 2000) and is now becoming common in southern Alabama and Mississippi where it was first reported in 2002 (MacGown and Wetterer 2002).

Diagnosis

Gnamptogenys triangularis can be separated from similar ants in the Southeast by its medium size (TL ≈ 5.0 mm), the presence of a one-segmented waist and the distinct horizonal grooves and ridges that run along the body. The only other species in this genus in the Southeast is *G. hartmanni* (Wheeler), which is smaller (only 3.5–4.0 mm in total length as compared to *G. triangularis,* which is about 5.0 mm in total length), pale reddish-brown in color, and lacks small propodeal teeth.

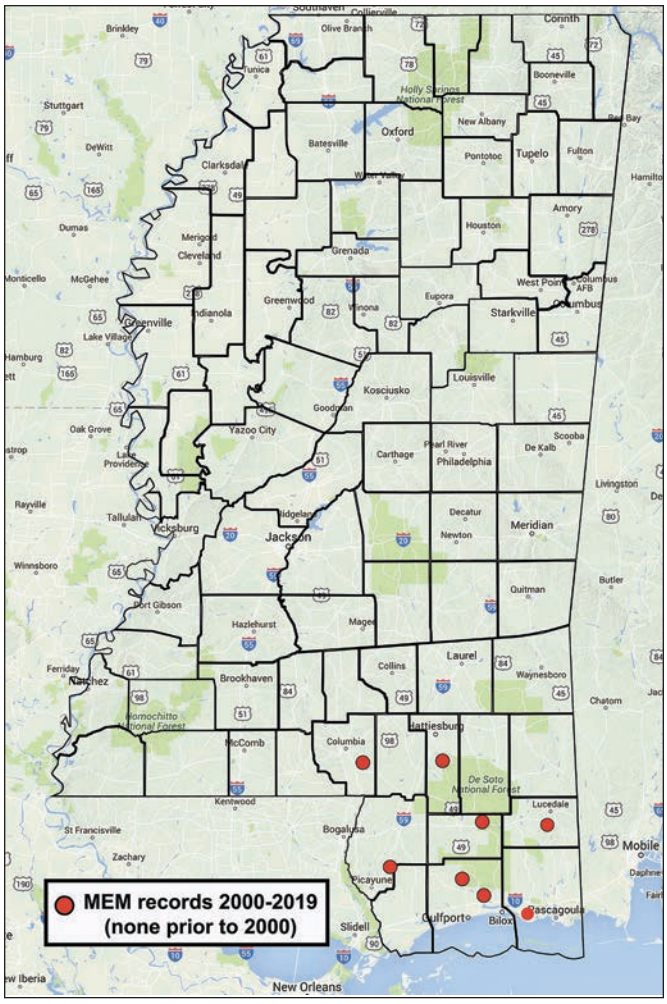
Descriptions

Worker (Figure 30): Medium sized (HL 1.13–1.18 mm, HW 1.07–1.13 mm, SL 1.07–1.10 mm, EL 0.26–0.27 mm, MeSL 1.67–1.74 mm) (n=5, MEM specimens). Dark reddish-brown head, mesosoma, and gaster with lighter reddish-brown legs and antennae. The entire body, including the head, mesosoma, and gaster shiny, with distinct, longitudinal grooves. Head about as long as wide, squarish; with longer erect setae; eyes located laterally along the midline of the head; antennal insertion points well separated without well-developed frontal lobes; antennae 12-segmented, scape barely exceeding posterior border of head; mandibles elongate, triangular, with smooth to minutely serrated inner margins. Mesosoma with numerous erect setae; mesonotal suture distinct; propodeal spines minute; metacoxal spine distinct and well developed. Waist with a single petiolar node, with distinct, shining ridges; anteriorly directed subpetiolar process present ventrally. Gaster with numerous erect setae; first two segments elongated to make up most of the gaster; distinct, deep suture between the first two segments; first gastral sternite with anteroventral anterior projection; sting present.

Queen (Figure 31): Medium sized (HL 1.18–1.24 mm, HW 1.18–1.22 mm, SL 1.06–1.13 mm, EL 0.31–0.32 mm, MeSL 1.86–2.01 mm) (n=5, MEM specimens). Dark reddish-brown head, mesosoma, and gaster with lighter reddish-brown legs and antennae. Head, mesosoma and gaster shiny, with distinct, longitudinal grooves. Head about as long as wide, squarish; with conspicuous, erect setae; eyes situated laterally at about the midpoint of the head; three ocelli present; distinct frontal lobes present; antennae 12-segmented, scape barely exceeding posterior border of head; mandibles elongate, triangular, edentate, with minute dentition. Mesosoma with erect setae; enlarged with four wings or wing scars present; metacoxal spine distinct, but not always as well developed as in the workers; propodeal spines minute. Wings grayish-brown fading to clear along lower wing margins; forewing with costal, basal, subbasal, submarginal, and discal cells present, pterostigma present; hindwing with costal, basal,

subbasal, and one submarginal cell present. Waist with a single petiolar node, with distinct, shining ridges; anteriorly directed subpetiolar process present ventrally. Gaster with numerous erect setae; first two segments elongated to make up most of the gaster; distinct, deep suture between the first two segments; first gastral sternite with anteroventral anterior projection; sting present.

Male (Figure 32): Medium sized, slightly smaller than workers (HL 0.97–1.01 mm, HW 0.91–0.98 mm, SL 0.23–0.27mm, EL 0.42–0.46 mm, MeSL 1.84–1.93 mm) (n=5, MEM specimens). Head and mesosoma dark brownish-black, gaster reddish-brown, legs, mandibles, antennal scapes and first funicular segment light reddish-brown, and remainder of funiculus dark brown. Head about as long as wide, evenly rounded posteriorly; deep vertical rugae present except posterior corners of head, which are smooth; numerous long, erect setae; eyes large, bulging out on sides of head; three slightly protruding ocelli present; frontal lobes reduced to form a cup-like antennal insertion points; antennae 13-segmented, second segment about as wide as it is long, scape short; mandibles well developed, triangular, overlapping apically, inner margins with minute serrations; long apical tooth present. Mesosoma evenly curved dorsally, with numerous, elongate, erect setae present, especially dorsally; anterior portion of pronotum, mesoscutum, and mesopleura with reduced sculpture and shiny, remainder of mesosoma and mesopleural suture with deep oval fovea, fovea on propodeum forming tight reticulation. Wings grayish-brown fading to clear along lower wing margins; forewing with costal,



Map 9. *Gnamptogenys triangularis* site records in Mississippi based on MEM specimens.

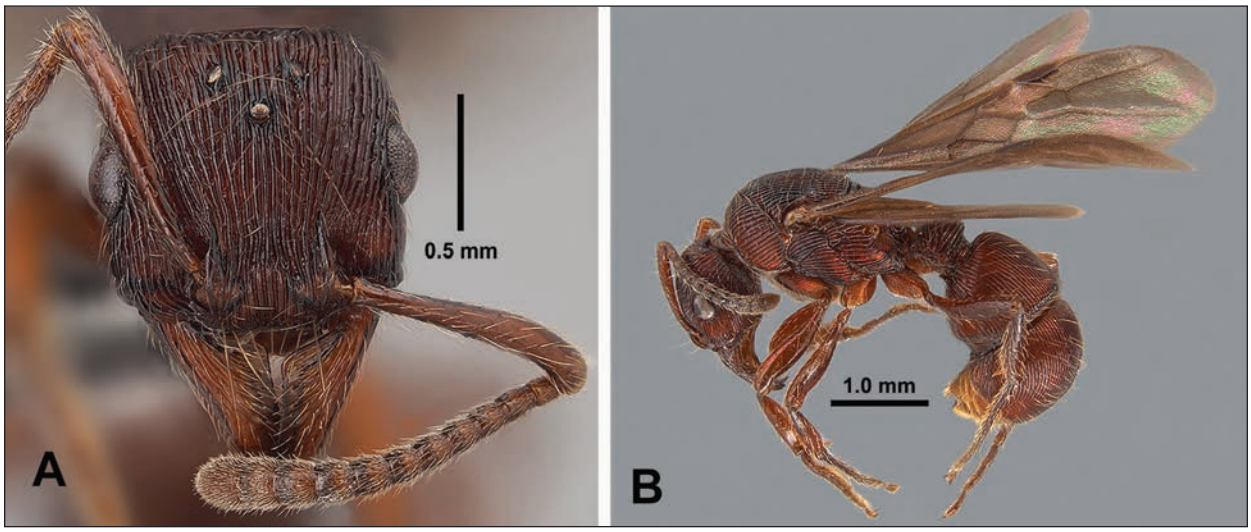


Figure 31. *Gnamptogenys triangularis* alate queen (A) full face view and (B) lateral view.

basal, subbasal, submarginal, and discal cells present, pterostigma present; hindwing with costal, basal, subbasal, and one submarginal cell present. Waist with a single petiolar node; node is domed and subquadrate when viewed dorsally; ventrally directed subpetiolar tooth present; leading edge with two dorsally located processes. Gaster with dense, erect setae; first tergite shagreened; remainder smooth and shiny; first two segments enlarged with a distinct constriction between them; first gastral sternite with anteroventral anterior projection; parameres triangular.

Biology

This species is reported to be a predator of millipedes, and fragments of millipedes have been found in a nest in Florida (Deyrup et al. 2000, Lattke 1995). A small colony was found by Lloyd Davis in forested habitat in Harrison County, Mississippi, in June in a small rotting branch on the ground. We have observed males flying to flowers on roadside bushes during daylight in midsummer in coastal Mississippi.

Pest Status

Deyrup et al. (2000) considered *G. triangularis* to be rare and to have negligible effects on the environment. In certain areas of southern Alabama and Mississippi, the MEM has found this species to be increasingly abundant, which raises the question of potential effects on native ant species. Workers and queens of *G.triangularis* possess stingers, so if this species becomes more widespread and abundant in the region it is possible that it could pose a stinging threat to humans. However, thus far we are unaware of any reports of this species stinging humans, and certainly, it is not an aggressive species.

Distribution

According to Lattke et al (2007), the native range for *G. triangularis* is Costa Rica to Argentina. In the U.S., this species has only been reported from Alabama, Florida, and Mississippi. Mississippi county records include Forrest, George, Harrison, Jackson, Lamar, Pearl River, and Stone (Map 9).

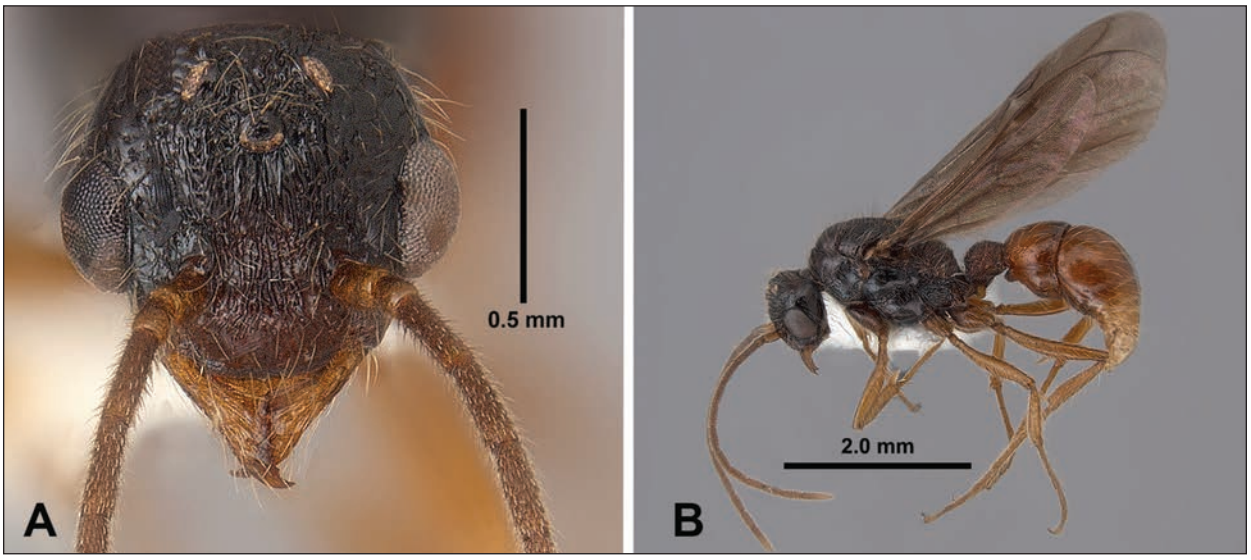


Figure 32. *Gnamptogenys triangularis* male (A) full face view and (B) lateral view.

Hypoponera opaciceps (Mayr, 1887) — "granulate mini-ponerine ant"

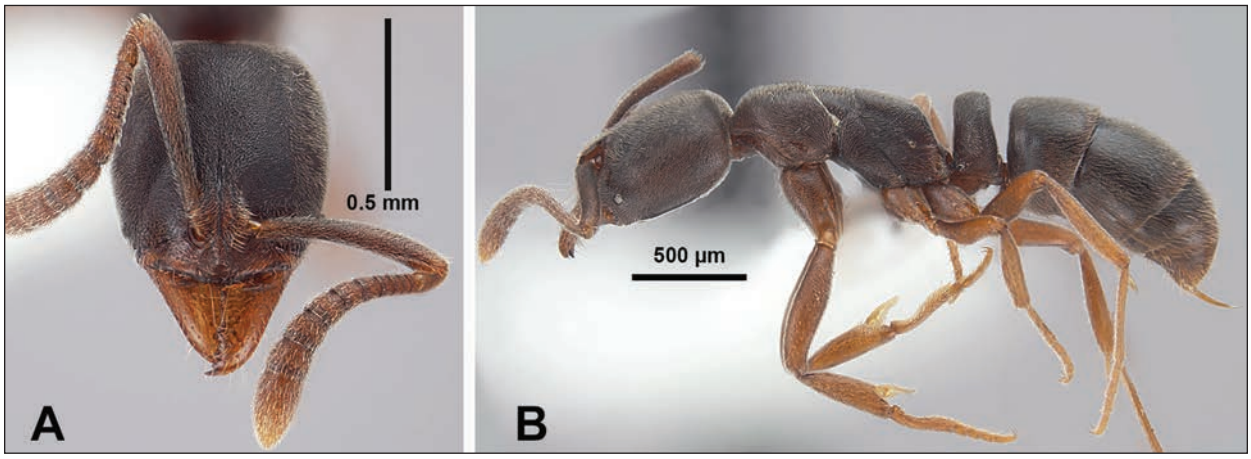


Figure 33. *Hypoponera opaciceps* worker (A) full face view and (B) lateral view.

Summary

Hypoponera opaciceps (Mayr) (Ponerinae) is a small, dark-brown to brownish-black species native to the Neotropics (AntWeb 2020). This species has been established in the U.S. for many years from South Carolina south to Florida and west to California. It was reported from Mississippi in 1929 by M. R. Smith (1929).

Diagnosis

Workers of *Hypoponera opaciceps* can be recognized by their small size (TL ≈ 3.0 mm), dark coloration, opaque body sculpturing, coating of dense, appressed pubescence, tiny eye, 12-segmented antennae, single petiolar node, which is about the same width at base as at apex, a simple rounded subpetiolar process, first two gastral segments enlarged, and the presence of a prominent sting. Similar species include *H. opacior* (Forel), which differs by having the petiole (of workers) gradually tapering apically in profile; and *Ponera pennsylvanica* Buckley, which differs by the subpetiolar process having two distinct teeth posteriorly and a circular fenestra present anteriorly. Other species of *Hypoponera* in the Southeast are much smaller in size.

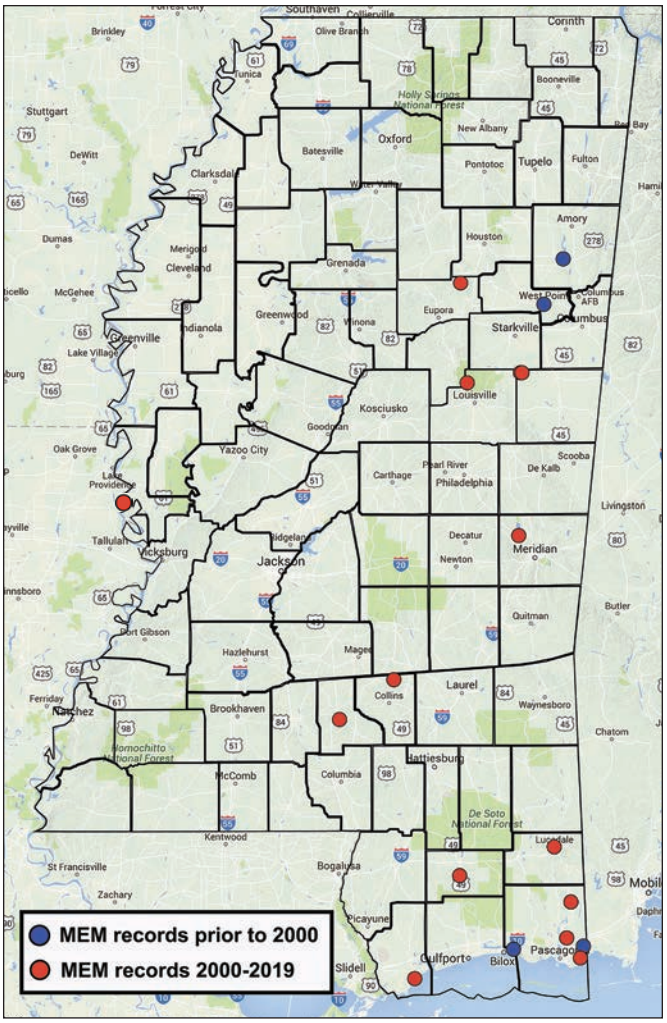
Descriptions

Worker (Figure 33): Small (HL 0.80–0.83 mm, HW 0.67–0.72 mm, SL 0.60–0.64 mm, EL 0.04–0.06 mm, MeSL 1.04–1.07 mm) (n=5, MEM specimens). Head and body reddish-brown to brownish-black; legs, funiculi and mandibles reddish-brown. Head longer than wide, rounded rectangular, with fine punctation and dense short, appressed setae giving it a velvety look; frontal lobes prominent, covering antennal insertions; eye reduced and located laterally on anterior 1/4 of the head; antenna 12-segmented, funiculus gradually becoming clavate apically; mandibles elongate triangular, outer borders more or less straight, apical tooth longest with numerous smaller teeth and denticles along inner borders. Mesosoma broadly convex in profile view; promesonotal and metanotal sutures present but not deeply impressed; propodeum gently sloped, slightly concave entire mesosoma with fine punctation and dense appressed, short setae. Waist with a single petiolar node; node relatively tall, approximately the same width throughout its height; subpetiolar process simple, rounded lacking teeth or a fenestra (as in *Ponera* species). Gaster with first two segments elongate and about twice the size of the remaining segments or longer; first segment overlapping the second; entire gaster with dense, short setae and with longer erect setae that become more conspicuous near apex; long, curved sting present.

Queen (Figure 34): Small, slightly larger than workers (HL 0.82–0.86 mm, HW 0.72–0.76 mm, SL 0.64–0.68 mm, EL 0.18–0.20 mm, MeSL 1.16–1.28 mm) (n=5, MEM specimens). Head and body reddish-brown to brownish-black; legs, funiculus and mandibles reddish-brown. Head longer than wide, rounded rectangular, with fine punctation and dense, short, appressed setae; frontal lobes prominent, covering antennal insertions; ocelli present; eyes large, located on anterior 1/3 of head; antenna 12-segmented, funiculus gradually becoming clavate apically; mandibles elongate triangular, outer borders more or less straight, apical tooth longest with numerous smaller teeth and denticles along inner borders. Mesosoma enlarged, blocky rectangular;

pronotum somewhat rectangular in lateral view; mesopleural suture present; propodeal declivity strongly angled; entire mesosoma with fine punctation and dense appressed, short setae. Wings, when present, hyaline, veins and pterostigma light yellowish, each wing with a submarginal and discal cell. Waist with a single petiolar node; node slightly narrower apically than basally; subpetiolar process simple, rounded, lacking teeth or a fenestra (as in *Ponera* species). Gaster with first two segments elongate and about twice the size of the remaining segments or longer; first segment overlapping the second; entire gaster with dense, short setae and with longer erect setae that become more conspicuous near apex; long, curved sting present.

Male (Figure 35): Smaller than worker (HL 0.63–0.69 mm, HW 0.50–0.59 mm, SL 0.11–0.12 mm, EL 0.30–0.33 mm, MeSL 1.12–1.23 mm). (n=5, MEM specimens). Head, body, coxae and funiculi (excluding pedicel) brown; scape, pedicel, and legs yellowish-brown. Head circular, with dense, short, appressed setae; clypeus with three long medial setae projecting anteriorly; eye large, approximately half of the length of the head; three large ocelli medially present on the posterior apex of the head; antenna 13-segmented, filiform lacking club; mandibles reduced, edentate. Mesosoma enlarged, rounded convexly; pronotum rectangular; mesopleural suture present; propodeal declivity gently curved; entire mesosoma with dense appressed, short setae. Wings hyaline, veins and pterostigma light yellowish, each wing with a submarginal and discal cell. Waist with a single petiolar node; node rounded trian-



Map 10. *Hypoponera opaciceps* in Mississippi site records in Mississippi based on MEM specimens.

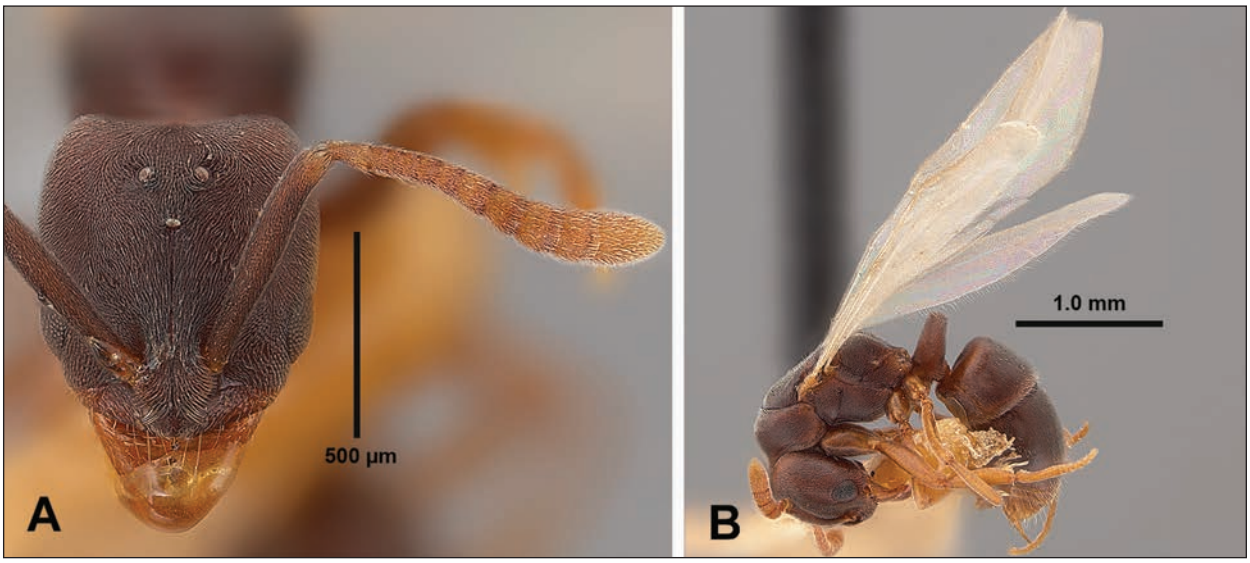


Figure 34. *Hypoponera opaciceps* alate queen (A) full face view and (B) lateral view.

gular, much wider basally than apically; subpetiolar process rounded. Gaster with first two segments elongate and about twice the size of the remaining segments or longer; entire gaster with dense, short setae and with longer erect setae that become more conspicuous near apex; genitalia conspicuous, parameres large.

Biology

Little is known about the behavior and biology of *Hypoponera opaciceps*. It has been collected in leaf litter, where it is suspected to forage on leaf mold. It is rarely found foraging in the open but has not been reported at baits. Based on MEM records, *H. opaciceps* specimens are often collected in disturbed open and wooded habitats such as in open wooded areas at recreational parks, nesting between shells on shell middens, in disturbed bottomland forest sites, in open fields with cogon grass, in disturbed mixed pine/hardwood forests, and nesting in piles of pine bark left from logging. It has spread across the Nearctic and Neotropical regions quite readily. Colonies can commonly be found nesting in potted plants and soil, and it is suspected that Florida's plant nurseries have inadvertently aided in the spread of this species. Soil ballasts used by ships taken from infested beaches probably also played a part in the spread of this species (Deyrup et al. 2000).

Pest Status

Although *Hypoponera opaciceps* is not aggressive toward humans, it is considered to be a minor pest because it may sting if disturbed.

Distribution

The native range of *H. opaciceps* is the Neotropics (AntWeb 2020). This species is common in the U.S. and has been reported from Alabama, Arkansas, Arizona, California, Colorado, Florida, Georgia, Hawaii, Louisiana, Mississippi, North Carolina, New Mexico, South Carolina, Texas, Utah, Virginia, and Washington (AntWeb.org and MEM records). MEM records from Mississippi include the following counties: Clay, Covington, George, Hancock, Issaquena, Jackson, Jefferson Davis, Lauderdale, Monroe, Noxubee, Stone, and Winston (Map 10).

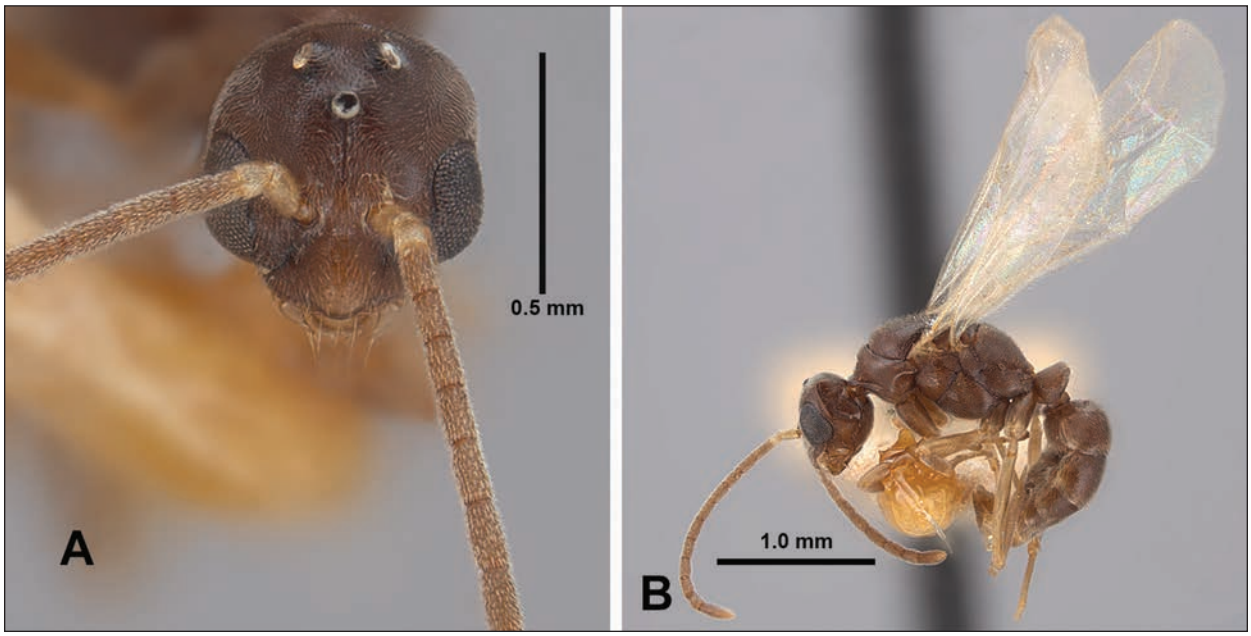


Figure 35. *Camponotus planatus* minor worker (A) full face view and (B) lateral view.

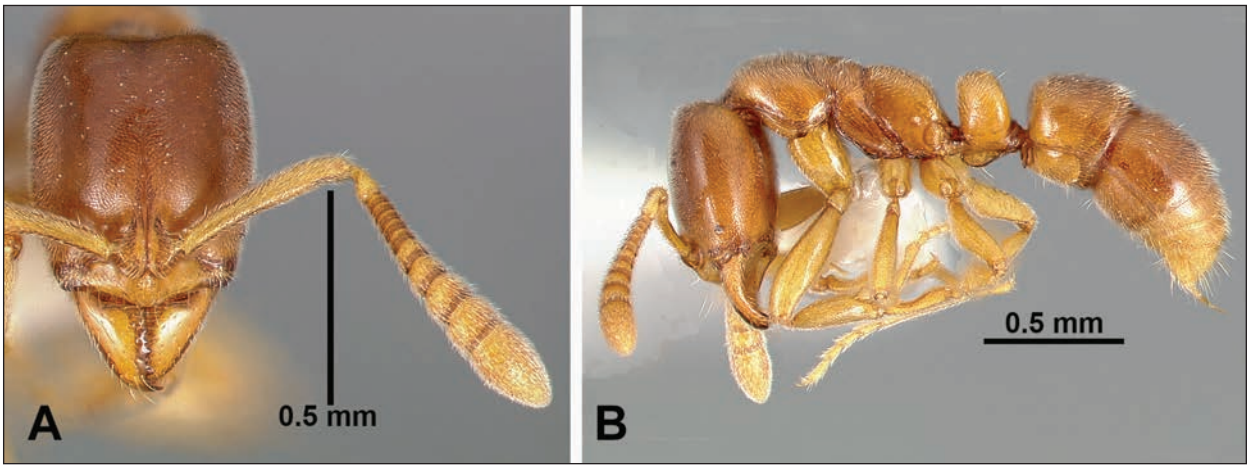


Figure 36. *Hypoponera punctatissima* worker (A) full face view and (B) lateral view. (from Antweb.org, photo by April Nobile Specimen: CASENT0005427).

Summary

Hypoponera punctatissima (Roger) (Ponerinae) is a small, yellowish-brown, stinging species thought to be native to western Europe or Africa (Delabie and Blard 2002). *Hypoponera punctatissima* is considered to be one of the most widespread tramp ants in the world. However, in the U.S., this species does not appear to be widespread or common, except in Florida, where it is an occasional nuisance pest.

Diagnosis

Workers of *Hypoponera punctatissima* can be recognized by their small elongate body (TL ≈ 2.0 mm), narrowed head, yellowish-brown to brown coloration, shiny integument with dense, appressed pubescence, tiny eye, single rounded petiolar node with simple subpetiolar process, the first two gastral segments enlarged, and the presence of a prominent sting. In Mississippi, this species is easily distinguished from others in the same genus by its much smaller size and from the very similar *Ponera exotica* Smith by the simple subpetiolar process.

Descriptions

Worker (Figure 36): Measurements and description from Bolton and Fisher 2011 and based on photos of specimens on AntWeb.org). Small (HL 0.56–0.72 mm, HW 0.46–0.60 mm, SL 0.35–0.48 mm, MeSL 0.70–0.90 mm). Overall coloration yellowish-brown to dark brown. Head longer than wide; shiny integument somewhat dulled by numerous piligerous pits; entire head with dense appressed, short setae, setae denser along lateral edges; eyes small, located laterally on the anterior 1/4 of the head; antennae 12-segmented with a three-segmented club, scape does not reach posterior margin of the head; mandibles triangular in shape. Mesosomal dorsum mostly flat in lateral view, promesonotal and metanotal sutures present; dorsum with dense, short semierect to erect setae; mesopleuron and sides of pronotum and propodeum smooth and shining, mostly glabrous. Waist single segmented; petiolar node subrectangular, about as wide as tall, broadly rounded apically, with numerous short, erect setae present anteriorly, dorsally, and posteriorly and glabrous and shiny laterally; subpetiolar process simple, rounded. Gaster with a definite constriction between segments one and two; first two segments twice the length or longer than the remaining segments; numerous setae present including a mixture of short hair-like setae and longer, erect setae; prominent sting present.

Queen (Figure 37): Minute, slightly larger than workers (HL 0.62–0.66 mm, HW 0.51–0.53 mm, SL 0.37–0.42 mm, EL 0.13–0.15 mm, MeSL 0.84–0.92 mm) (n=5, MEM specimens). Overall coloration orangish-brown to brown, antennae and legs yellowish-brown. Head longer than wide; shiny integument somewhat dulled by numerous piligerous pits; entire head with dense appressed, short setae, setae denser along lateral edges; eyes large, located laterally on the anterior 1/3 of the head; ocelli present; antennae 12-segmented with a three-segmented club, scape does not reach posterior margin of the head; mandibles triangular in shape.

Mesosomal dorsum mostly flat in lateral view, enlarged for wings; promesonotal and metanotal sutures present; dorsum with dense short, hair-like setae; pronotum, mesopleuron, and propodeal sides with less dense setae, shinier in appearance than dorsum. Waist single segmented, petiolar node subrectangular, about as wide as tall broadly rounded apically, with numerous short, erect setae present anteriorly, dorsally, and posteriorly and glabrous and shiny laterally; subpetiolar process simple, rounded. Gaster with a definite constriction between segments one and two; first two segments twice the length or longer than the remaining segments; numerous setae present including a mixture of short hair-like setae and longer, erect setae; prominent sting present.

Male (description from Bolton and Fisher 2011): Ergatoid males are produced and fall into two categories with one group being larger, brown, and with small eyes present; and the second group being smaller, yellow, and eyeless (Yamauchi et al. 1996). These ergatoid males are very worker-like, especially in head structure but have shorter scapes (SI 68–72), only 12-segmented antennae (as do workers, intercastes, and queens), and fully developed male genitalia. Alate males have never been observed, and it is assumed that they do not exist.

Biology

Hypoponera punctatissima is a widely distributed tramp species that has spread throughout the world following the spread of humans (Delabie and Blard 2002). Colonies occur in soil, rotting wood, gardens, and various disturbed habitats. However, colonies may also become established in cooler climates by nesting in greenhouses, homes, compost piles, and horse manure, as well as in and around heat sources associated with humans. In fact, Delabie and Blard (2002) stated that horse stables are good potential places to collect this minute, cryptic species. Winged males of this species are not known, but instead ergatoid males are produced. These males mate with alate queens that then disperse to find new areas to start colonies.

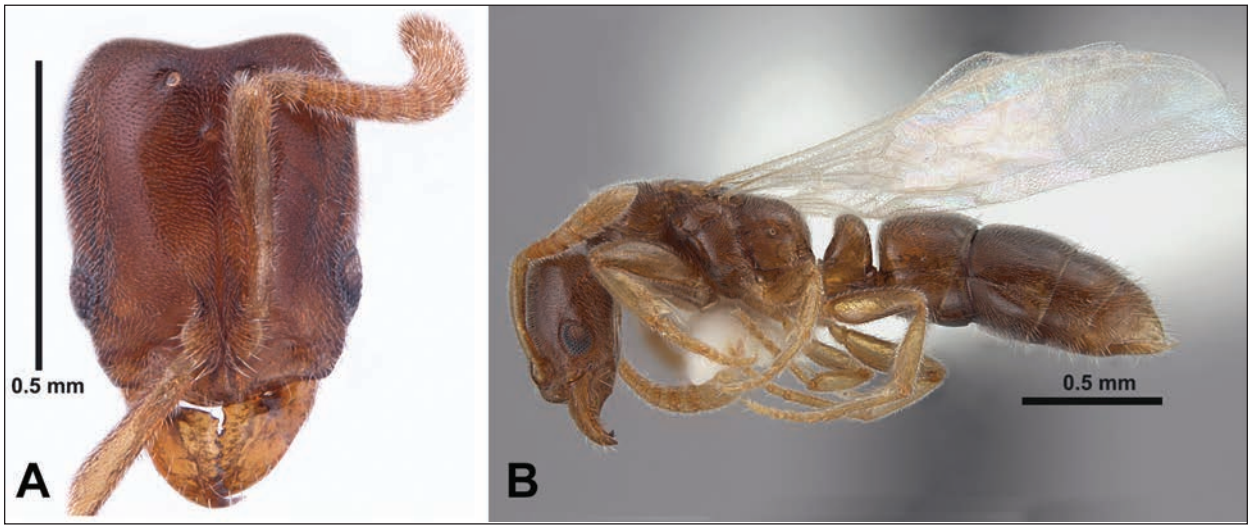


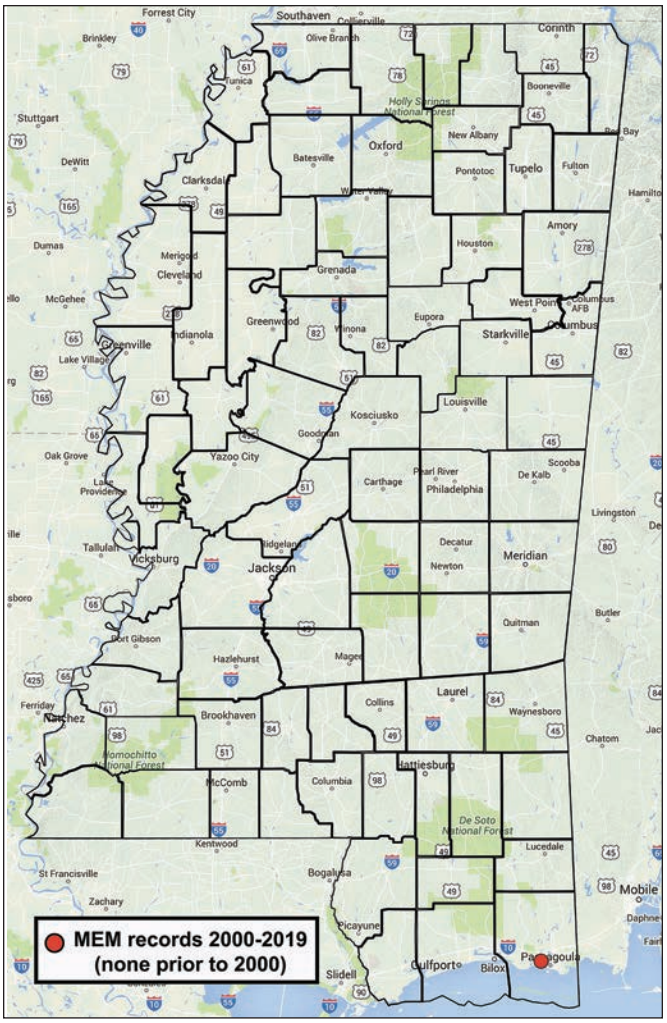
Figure 37. *Hypoponera punctatissima* alate queen (A) full face view and (B) lateral view.

Pest Status

This cosmopolitan species is not considered to be economically important but is considered to be an occasional stinging pest. Stings are usually from winged queens that become trapped beneath clothing or in sweat.

Distribution

This species is thought to be native to western Europe or Africa (Delabie and Blard 2002). State records from the U.S. include Alabama, Arizona, California, Florida, Hawaii, Iowa, Louisiana, Mississippi, North Carolina, New Mexico, South Carolina, Texas, and Washington (AntWeb.org and MEM). In Mississippi, this species has only been collected in Jackson County (Map 11).



Map 11. *Hypoponera punctatissima* site records in Mississippi based on MEM specimens.

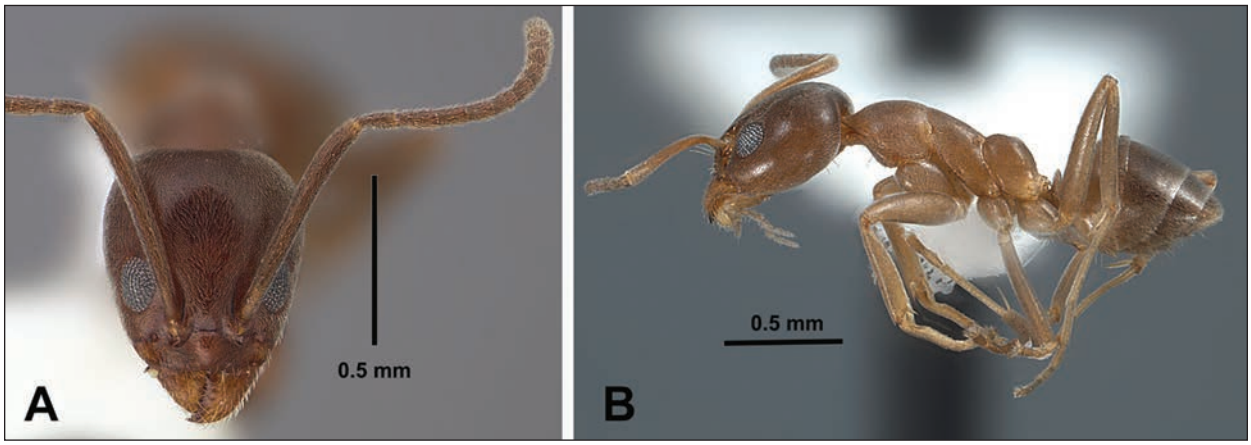


Figure 38. ***Linepithema humile*** **worker (A) full face view and (B) lateral view.**

Summary

Linepithema humile (Mayr) (Dolichoderinae) is a small, brown species native to Argentina and Brazil. The Argentine ant is thought to have first arrived in the U.S. in coffee shipments to New Orleans around 1891. Since its arrival in the U.S., it has spread eastward into the Carolinas and as far south as southern Florida and westward into Texas and California.

Diagnosis

Workers of *Linepithema humile* can be separated from other ant species in the area by their small size (TL ≈ 2.2–2.6 mm), brown color, fine pubescence that dulls the integument, lack of standing erect setae, 12-segmented antennae lacking a club, single erect petiolar node, and the lack of a sting or acidopore at the apex of the gaster. *Linepithema humile* can be separated from the similar genus *Forelius* by the longer, triangular shaped mandibles and short clypeal setae that do not extend past the mandibles when they are closed. *Forelius* species have mandibles that are not triangular when closed with long clypeal setae that extend past the mandibles when closed. *Linepithema humile* is very similar to *Tapinoma sessile* (the odorous house ant) but differs by having an erect petiolar node rather than a flattened node as in *Tapinoma* species.

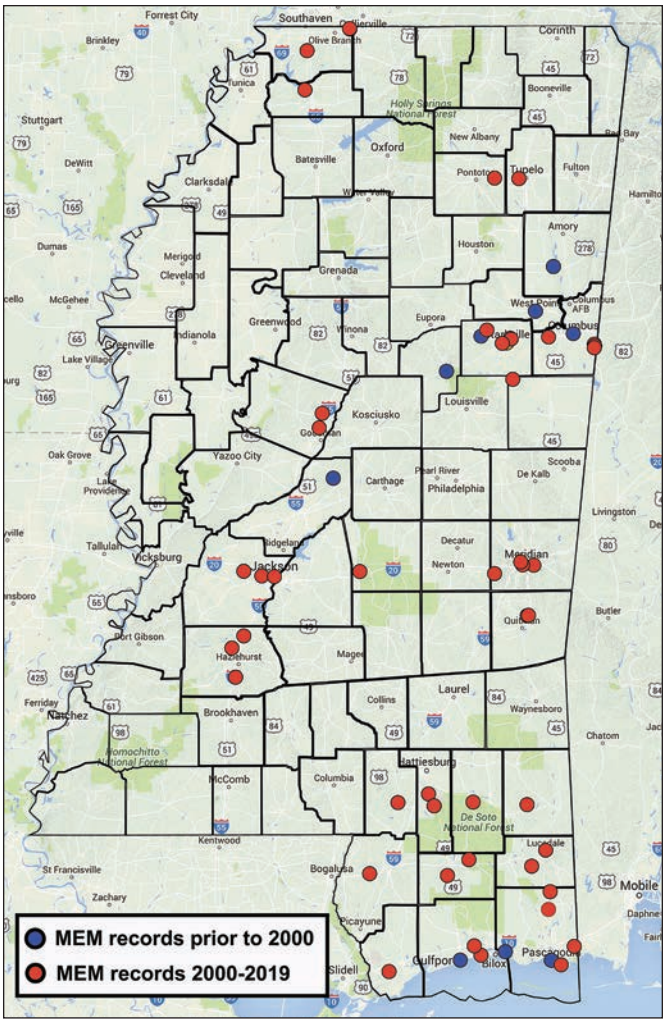
Descriptions

Worker (Figure 38): Small (HL 0.70–0.76 mm, HW 0.61–0.69 mm, SL 0.73–0.75 mm, EL 0.19–0.20 mm, MeSL 1.00–1.07 mm) (n=5, MEM specimens). Usually uniformly brown, or somewhat bicolored with mesosoma brown and head and gaster brownish-black. Head oval to triangularly shaped with dense, short, appressed setae; eyes well developed and located in front of the midline of the head; antennae 12-segmented, lacking a club; clypeus with two to six setae that are shorter than the closed mandibles; mandibles triangular with two distinct apical teeth followed by multiple denticles. Mesosoma: promesonotum somewhat convex; distinct promesonotal suture present; propodeum rounded, lacking teeth or denticles; entire mesosoma with dense, fine, appressed pubescence, larger erect setae lacking. Waist with a single petiolar node, node wider basally and tapering to a point apically (lateral view). Gaster does not project over the petiole; somewhat shiny with dense, short, appressed setae; sting or acidopore not present.

Queen (Figure 39): Larger than workers (HL 0.91–0.99 mm, HW 0.88–0.96 mm, SL 0.91–0.94 mm, EL 0.40–0.42 mm, MeSL 2.16–2.42 mm) (n=5, MEM specimens). Uniform dark reddish-brown to dark brown to slightly bicolored with head and mesosoma reddish-brown and gaster brownish-black. Head about as wide as long, squarish; with dense, appressed pubescence that does not completely obscure the shiny integument; longer erect setae lacking; eyes large, about 1/3 or more the length of the head, located on bottom half of head; three ocelli present; antennae 12-segmented, lacking a club; clypeus with two to six setae that are shorter than the closed mandibles; mandibles triangular and multidentate. Mesosoma elongate, dorsum broadly convex with mesocutellum rounded; propodeum unarmed; entire mesosoma lacking sculpture, shiny beneath dense, short, appressed setae; long, erect setae lacking. Wings

translucent yellowish-brown fading to clear at bottom and apical edges; forewing with brown pterostigma and with closed costal, basal, subbasal, anal, discal, and two submarginal cells; hindwing with closed basal and subbasal cells. Waist with single petiolar node, node wider basally and tapering to a point apically (lateral view). Gaster does not overhang the petiole; integument shiny beneath dense, short, appressed setae; longer erect setae lacking except for a few on apical sternites; sting or acidopore lacking.

Male (Figure 40): Small, slightly larger than workers (HL 0.64–0.67 mm, HW 0.66–0.69 mm, SL 0.18–0.19 mm, EL 0.34–0.38 mm, MeSL 1.59–1.76 mm) (n=5, MEM specimens). Brown to brownish-black to bicolored with head and gaster darker than the rest of the body, sometimes almost black. Head rounded posteriorly in frontal view, narrowed in lateral view; dense, appressed, short pubescence present; eyes large, about half the length of the head, located on the lower half of the head; three large ocelli present, slightly raised; when closed, the mandibles form a smooth arc; antennae 13-segmented; scape short, subequal in length with third antennomere; last eight antennomeres shorter; mandibles small, poorly developed. Mesosoma: mesoscutum enlarged, rounded, overhanging and bulging over pronotum; scutellar sulcus deep; mesoscutellum raised above propodeum; propodeum rectangular, declivity rounded, concave, upper part overhanging petiole, lacking spines or adornment; entire mesosoma shiny, lacking sculpture, with dense, appressed, short pubescence; longer, erect setae absent. Wings translucent yellowish-brown fading to clear at bottom and apical edges; forewing with brown



Map 12 *Linepithema humile* site records in Mississippi based on MEM specimens.

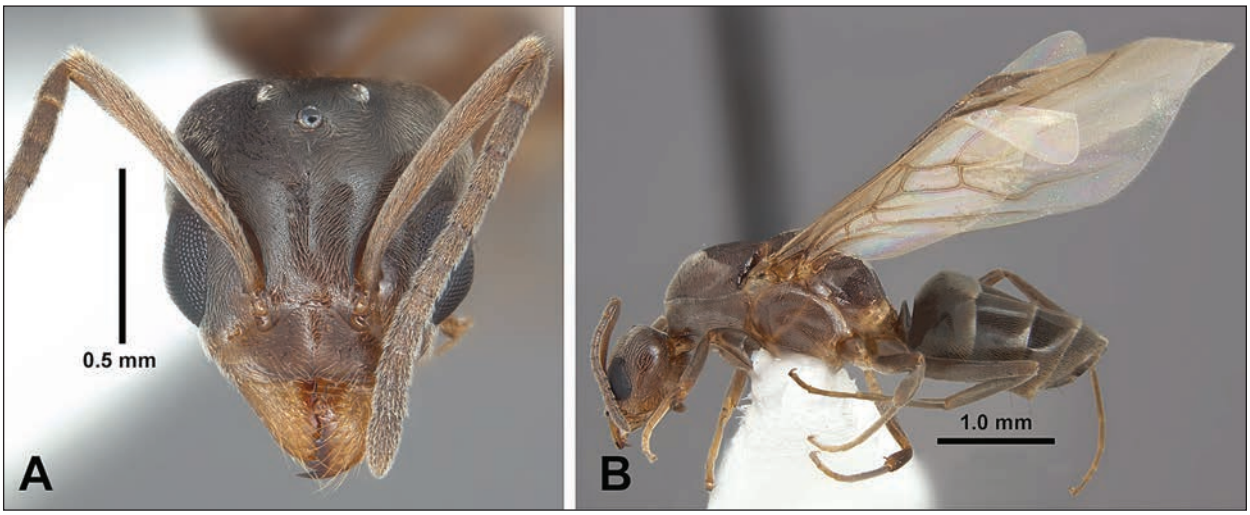


Figure 39. *Linepithema humile* alate queen (A) full face view and (B) lateral view.

pterostigma and with closed costal, basal, subbasal, anal, discal, and two submarginal cells; hindwing with closed basal and subbasal cells. Waist with a single small, smooth, rounded, petiolar node. Gaster sometimes overhanging petiole, shiny, lacking sculpture, with dense, appressed, short pubescence; longer, erect setae absent except for a few on sternites; genitalia with small parameres.

Biology

The Argentine ant has established itself as a major pest in the U.S. and elsewhere because of its ability to thrive in numerous types of habitats, its production of large numbers of workers due to the many reproductive queens in a colony, an omnivorous diet, which enables these ants to thrive on a great variety of foods, the ability to coexist with other colonies of the same species, forming super colonies in some cases, and their elimination of competing species of ants in their area. They nest in soil, both exposed and under cover, rotten wood, standing dead trees, refuse piles, bird nests, beehives, and many other places. The number of individuals of this species present in an area where they are established is incalculable with large files of workers running up and down trees, on fences, on the ground, and on other surfaces. Though there are winged males and females, nuptial flights have not been observed (Smith 1965).

Pest Status

Argentine ants have been considered to be one of the most persistent and troublesome of the house-infesting ants and are extremely difficult to control or eradicate (Layton and MacGown 2006, Smith 1965). Workers of this species do not have a sting but have been known to bite when provoked, which helps to increase their pest status. Ecologically, Argentine ants have an adverse effect on other ant species and other invertebrates in their area, and the collecting of ants and other insects typically results in low diversity of species in areas these ants occupy.

Distribution

The Argentine ant is native to the Paran· River Drainage, South America (Wild 2004). In the U.S., this species is known to occur in Alabama, Arkansas, Arizona, California, Florida, Georgia, Hawaii, Louisiana, Mississippi, North Carolina, New Mexico, Ohio, South Carolina, Tennessee, Texas, and Utah (AntWeb.org and MEM data). MEM records from Mississippi include the following counties: Choctaw, Clarke, Clay, Copiah, DeSoto, Forrest, George, Greene, Hancock, Harrison, Hinds, Holmes, Jackson, Kemper, Lamar, Lauderdale, Lee, Lowndes, Madison, Monroe, Noxubee, Oktibbeha, Pearl River, Perry, Pontotoc, Scott, Stone, Tate, and Webster (Map 12).

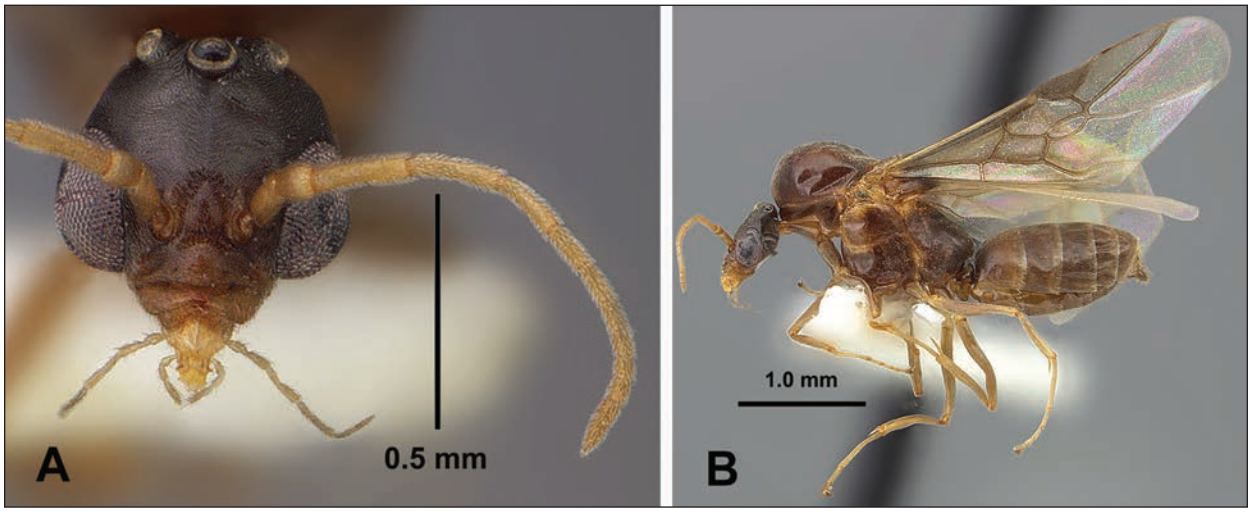


Figure 40. *Linepithema humile* male (A) full face view and (B) lateral view.

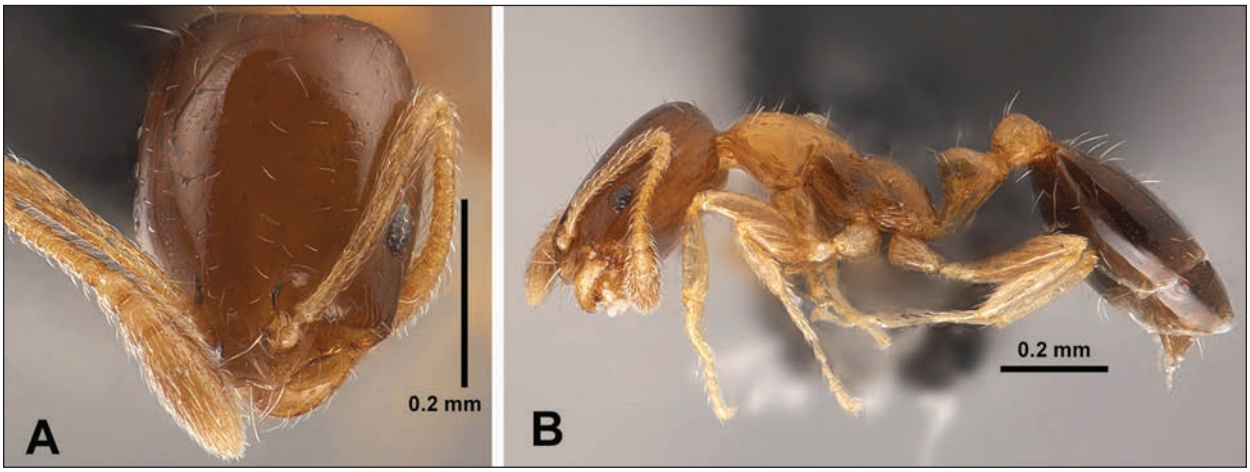


Figure 41. *Monomorium floricola* worker (A) full face view and (B) lateral view.

Summary

Monomorium floricola (Jerdon) (Myrmicinae) is a minute, bicolored, widely distributed tramp ant thought to be native to the Old World, possibly Southeast Asia (Wetterer 2010a). In the U.S., outdoor populations are only known to occur in Florida, coastal Alabama, and coastal Mississippi. Occasionally, populations are found in heated buildings such as greenhouses in temperate regions of both Europe and the U.S.

Diagnosis

Workers of *M. floricola* can be easily recognized by the minute size (TL ≈ 2.0 mm), smooth, shiny, bicolored appearance, 12-segmented antennae that terminates in a three-segmented club, raised and narrowed clypeus with a pair of fine longitudinal carinae, lack of propodeal spines, and sting. Other ants in the genus in our region are either all black or all yellow. Species of thief ants in the related genus *Solenopsis* have 10-segmented antennae and are not typically bicolored.

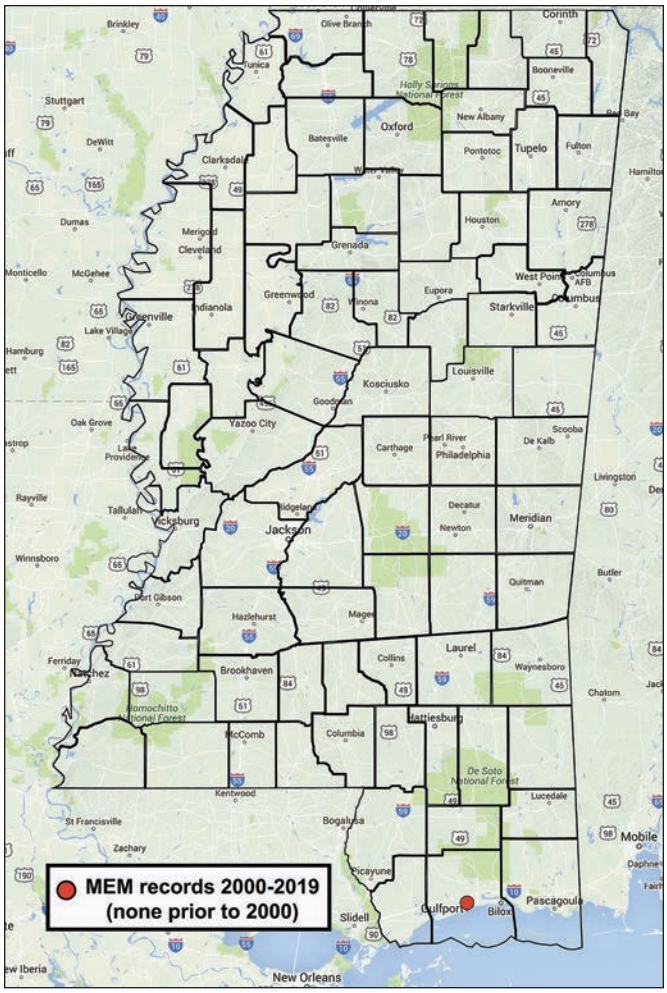
Descriptions

Worker (Figure 41): Minute (HL 0.41–0.43 mm, HW 0.31–0.34 mm, SL 0.28–0.32 mm, EL 0.06–0.07 mm, MeSL 0.42–0.47 mm) (n=5, MEM specimens). Head dark orangish-brown to brown, mesosoma and waist light orangish-brown and occasionally infuscated, gaster dark brown, and antennae and legs yellowish-brown to light orangish-brown. Head longer than wide, rounded rectangular; lacking sculpture, smooth and shiny; with scattered semierect to erect setae; clypeus raised, narrowed, with a pair of fine longitudinal carinae; eyes small (about five to six facets in longest diameter), located on side of head just in front of midline; ocelli lacking; antenna 12-segmented, with a three-segmented club; mandibles with three teeth and a minute basal denticle. Mesosoma elongate, somewhat narrowed; promesonotum broadly rounded (in lateral view); metanotal groove impressed; propodeum broadly rounded, dorsum longer than declivity, lacking spines or denticles, entire mesosoma smooth and shiny except for transverse striae at base of anepisternum, in metanotal suture, and base of propodeum; with scattered short, erect setae and a pair of long, erect setae on humeri. Waist two-segmented, smooth and shiny with several elongate, semierect setae present; petiole pedunculate, node about twice as long as tall, broadly conical in lateral view; postpetiole circular in lateral and dorsal views. Gaster is smooth and shiny with sparse, elongate, erect setae present; sting present.

Queen (Figure 42): (Description from Heterick 2006 and Antweb.org photos). Small, larger than workers. (HL 0.54–0.55 mm, HW 0.44–0.46 mm, SL 0.39–0.40 mm, PW 0.31–0.33 mm) (n=19) (measurements from Heterick 2006). Head and gaster brown; mesosoma yellowish-brown or with pronotum, mesopleura, and propodeum brown; antennae orangish-brown; and legs light yellowish-brown. Head rectangular; mostly shiny and lacking sculpture except piligerous setal pits; with regularly placed, slightly flexuous setae; eye elliptical, large, at about midpoint of head; three small ocelli present; antenna 12-segmented, with three-segmented club; scape not quite reaching posterior edge of head; mandible with four teeth. Mesosoma flattened dorsally;

pronotum rectangular; mesoscutum rounded anteriorly, propodeum rounded posteriorly, lacking spines or denticles; entire mesosoma shiny, with occasional light striolae on anterior region of anepisternum; mesosomal dorsum with numerous, semierect to erect, setae present. Winged specimens not known. Waist two-segmented, smooth, shining, with numerous erect setae present; petiole pedunculate, node broadly rounded; postpetiolar node rounded, slightly wider than petiole in dorsal view. Gaster shiny, with numerous erect and semierect setae with intersetal spaces about as long as setal length; sting present.

Male (Figure 43): (Description from Heterick 2006 and Antweb.org photos). Small, about the size of worker (HL 0.46 mm, HW 0.50 mm, SL 0.16 mm, PW 0.44 mm) (n=1) (measurements from Heterick 2006). Head, mesosoma, waist, and gaster dark brown; antennae, coxae, and femora brown; tibiae and tarsi pale yellowish-brown. Head slightly wider than long; smooth and shiny posteriorly, then with longitudinal striae beginning at near the posterior-most point of eye; scattered, somewhat stout, whitish setae present. eyes large, about half the head length; ocelli prominent, slightly raised; antenna 13-segmented (including scapes); scape about length of funicular segments 2+3; mandibles falcate, with three small teeth apically. Mesosoma: mesoscutum rounded, broadly convex; pronotum trapezoidal; propodeal dorsum angle about 45°, declivity about 90°, unarmed; pronotum, mesoscutum, mesoscutellum, and mesopleuron shiny (except pitted sculpture on anterior portion of katepisternum and near wing



Map 13*. Monomorium floricola* site records in Mississippi based on MEM specimens.

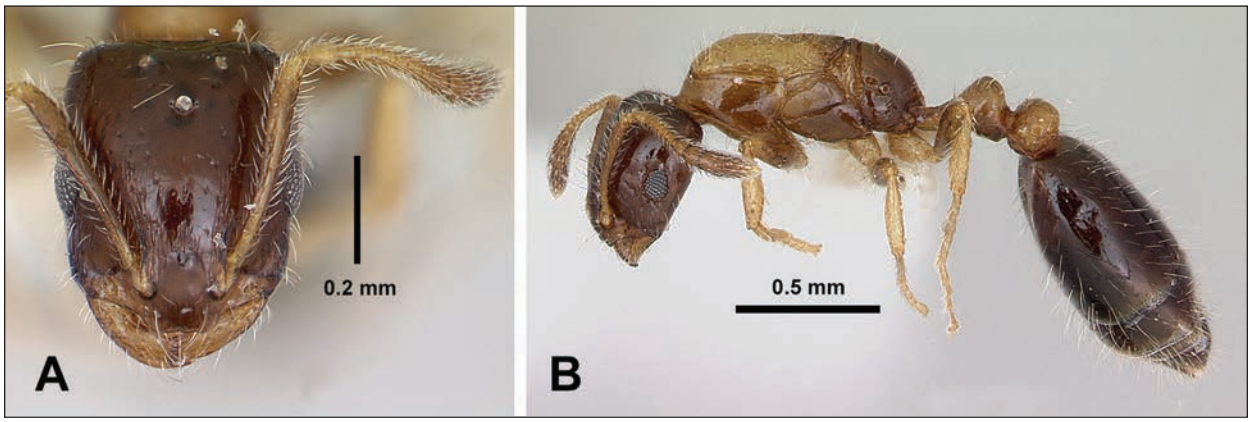


Figure 42. *Monomorium floricola* dealate queen (A) full face view and (B) lateral view.

bases); propodeal dorsum lacking sculpture but with pitted sculpture laterally; mesosomal dorsum with short semierect to erect setae directed posteriorly (not densely concentrated). Wings transparent; veins with little pigmentation, distal segments reduced to vestigial lines; m–cu absent; cu–a absent. Waist two-segmented, with curved setae, directed posteriorly (longer than setae on mesosoma); petiole rounded triangular in lateral view, rounded dorsally; with light sculpture anteriorolaterally and mostly smooth elsewhere; postpetiole rounded laterally and dorsally, with pitted sculpture except on dorsum. Gaster lacking sculpture, smooth and shining; with scattered short, semierect to erect setae, especially dorsally, and with a patch of more dense, longer setae on posterior sternites; genitalia visible externally, not greatly enlarged, parameres acutely triangular.

Biology

Monomorium floricola is an extremely abundant tramp ant that is typically found in tropical and subtropical regions, including Florida, and occasionally in greenhouses in temperate locations. Colonies are polygynous, with wingless queens. As a result, colonies rely on budding for dispersal instead of mating swarms (Snelling 2005). This species often has arboreal nests and can form colonies in small crevices and cracks in trees and bark. Colonies are easily transported by humans and may also spread by rafting across water on hollow logs, twigs, or plant debris. In natural conditions, workers feed on dead and living insects, tend insects producing honeydew, and feed at extrafloral plant nectaries.

Pest Status

This species commonly infests households, where it feeds on various sugary and protein-rich foods (Smith 1965). It is therefore considered a minor nuisance pest. Although workers and queens of *M. floricola* possess a sting, this species is not considered to be a serious stinging pest due to its minute size.

Distribution

Monomorium floricola is thought to be native to tropical Asia (Wetterer 2010a). In the U.S., this species has been reported from Alabama, Florida, Hawaii, and Mississippi. The only MEM records for this species in Mississippi are from Harrison County along the Gulf Coast (Map 13).

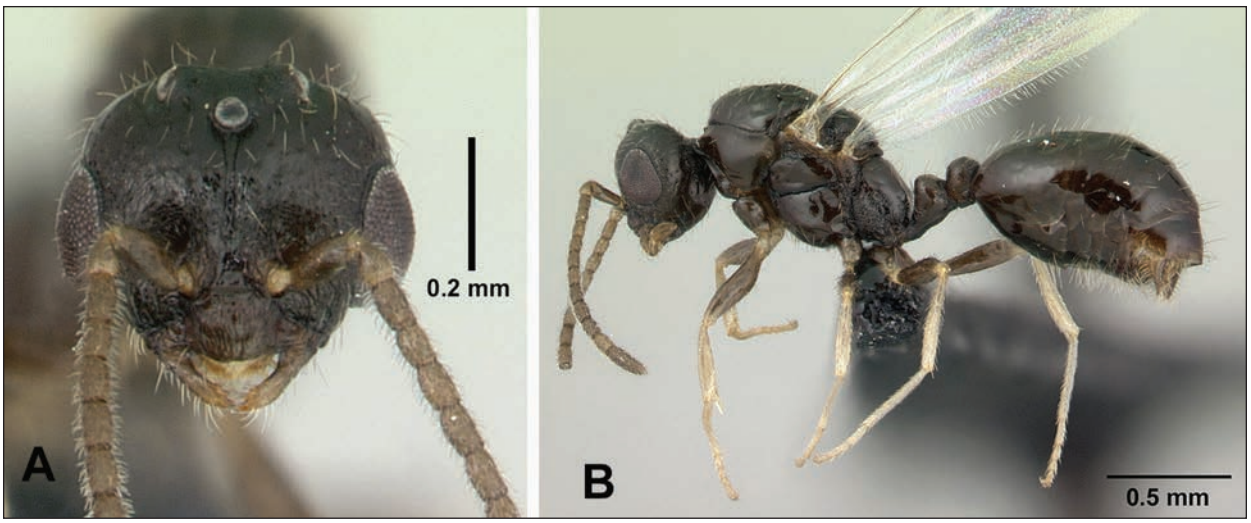


Figure 43. *Monomorium floricola* male (A) full face view and (B) lateral view. (from Antweb.org, photo by April Nobile Specimen: CASENT0104089).

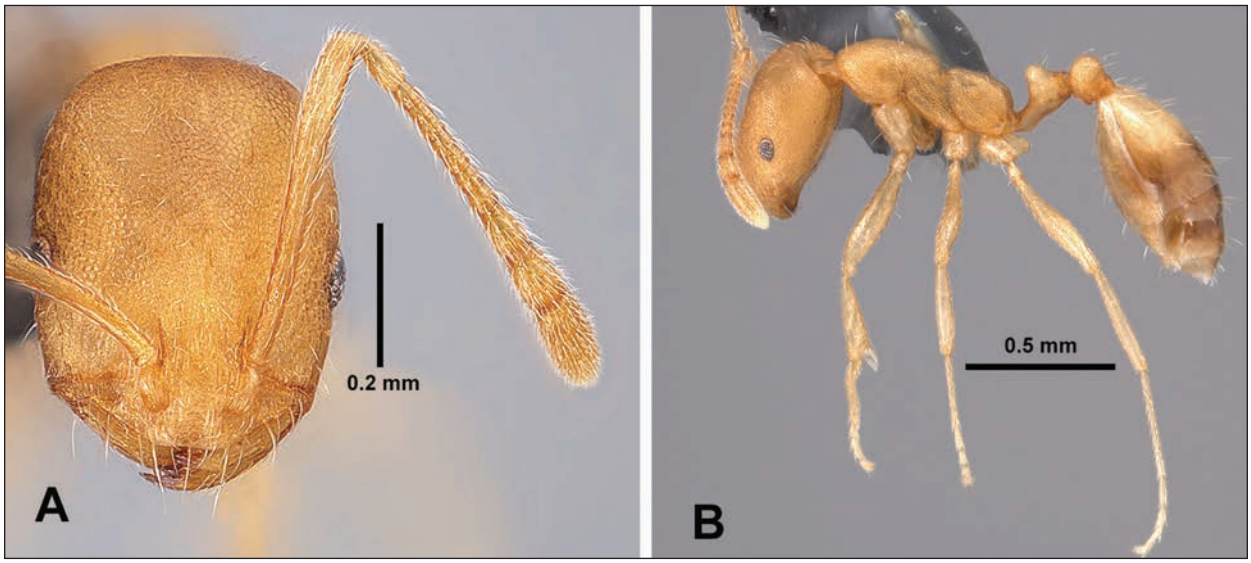


Figure 44. ***Monomorium pharaonis*** **worker (A) full face view and (B) lateral view.**

Summary

Monomorium pharaonis (Linnaeus) (Myrmicinae) is a tiny, yellow ant thought to be native to Asia (Wetterer 2010b). This species is a widespread tramp that occurs in many warm regions of the world. In temperate regions, including many parts of the U.S. where it has been recorded, populations are in heated structures. Populations of this species in Mississippi are spotty, and most records are from indoor infestations.

Diagnosis

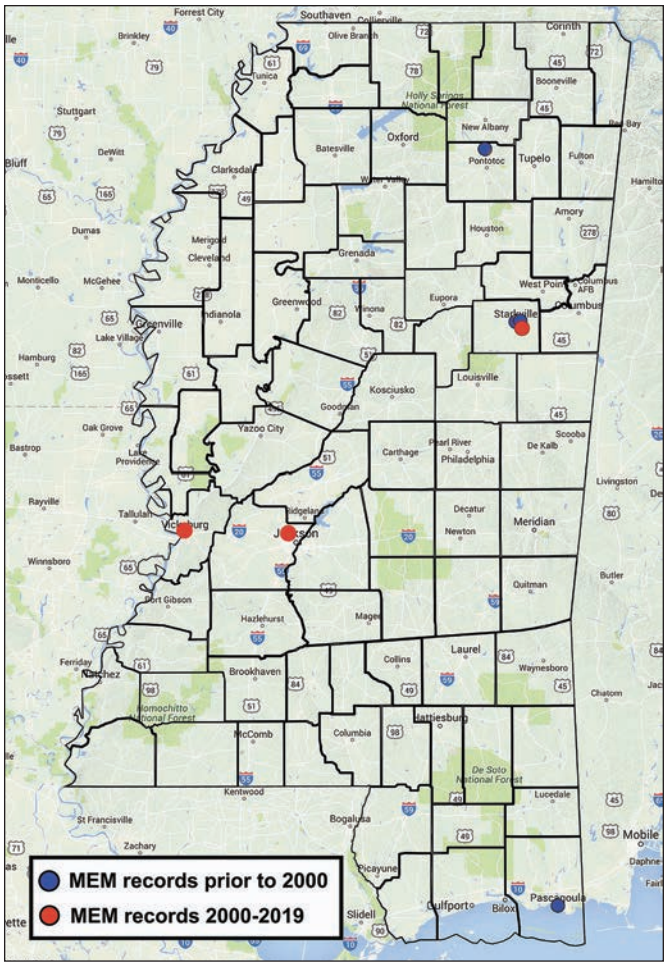
Workers of *Monomorium pharaonis* can be identified by their minute size (TL ≈ 2.0 mm), yellowish-brown color, light punctulate sculpture that does not completely obscure the shiny integument, 12-segmented antennae that terminates in a three-segmented club, raised and narrowed clypeus with a pair of fine longitudinal carinae, lack of propodeal spines, and lack of a sting. This species can be separated from other *Monomorium* species in the Southeast by its light golden-yellow color with brownish infuscation on the gaster. Species of thief ants in the related genus *Solenopsis* have 10-segmented antennae and lack fine sculpturing.

Descriptions

Worker (Figure 44): Minute (HL 0.56–0.64 mm, HW 0.44–0.49 mm, SL 0.47–0.52 mm, EL 0.08–0.10 mm, MeSL 0.63–0.72 mm) (n=5, MEM specimens). Overall light yellowish-brown with the posterior half of the gaster fading to brown or yellow with brown infuscation. Head longer than wide, rectangular, with fine micro reticulate punctation that does not completely obscure the shiny integument; with scattered, short, appressed to semierect setae; clypeus raised, narrowed, with multiple, weak carinae; eyes small, located on sides of the head near the midline; ocelli lacking; antenna 12-segmented, with three-segmented club, scape extending beyond posterior border of head by about the length of pedicel; mandibles with four teeth. Mesosoma somewhat narrowed and elongate; promesonotum smoothly curved and arched upward in lateral view; promesonotal suture weak; metanotal suture strongly impressed, propodeum distinctly separated from promesonotum and slightly depressed, propodeal dorsum about twice the height of propodeal declivity; entire mesosoma with dense, fine punctulate sculpture; promesonotum with a few long, erect setae. Waist two-segmented, with dense, fine punctulate sculpture and a few long, erect setae; petiole pedunculate, node conical in lateral view, petiole's height about 3/4 length of petiolar segment; postpetiole somewhat circular in lateral view, elliptical in dorsal view, wider than petiole. Gaster mostly shiny, with scattered, but numerous long, erect setae present; sting present.

Queen (Figure 45): (Description from Heterick 2006 and Antweb.org photos). Small, larger than worker (HL 0.66–0.68 mm, HW 0.62–0.63 mm, SL 0.58–0.62 mm PW 0.52–0.73 mm) (n=2, measurements from Heterick 2006). Head, mesosoma, waist and appendages

orangish-yellow to orangish-brown with mesoscutum and legs sometimes lighter, and dark brownish-black coloration at posterior region of mesoscutellum; and gaster with orangish-yellow at base of first tergite and posterior edges of tergites, with remainder dark brown to brownish-black. Head slightly longer than wide, with fine reticulation posteriorly, and becoming strialate below eye level, clypeus mostly smooth and shining; entire head with numerous (but not dense) short, slightly appressed setae; eyes large, located near midline of head in side view; three ocelli present; antenna 12-segmented with three-segmented club, scape length slightly less than head length, with appressed setae; mandibles with strong apical tooth followed by three shorter teeth of about equal size. Mesosoma thickened; mesoscutum rounded anteriorly then flattened; propodeum rounded, declivity much longer than dorsum, lacking adornment; entire mesosoma opaque, with fine foveolate sculpture limited to lower propodeal region; mesosomal dorsum with numerous short, erect setae. Wings present: transparent, with venation; forewing with pterostigma and with closed costal, basal, subbasal, anal, and two submarginal cells. Waist two-segmented, with dense, fine punctulate sculpture and a few long, erect setae; petiole conical in side view, pedunculate, rounded dorsally, somewhat concave anteriorly; postpetiole rounded in lateral and dorsal views. Gaster notched on anterior part of first tergite; entire gaster smooth, somewhat opaque with very fine microsculpture; numerous erect setae present; sting not conspicuous.



Map 14. *Monomorium pharaonis* site records in Mississippi based on MEM specimens.

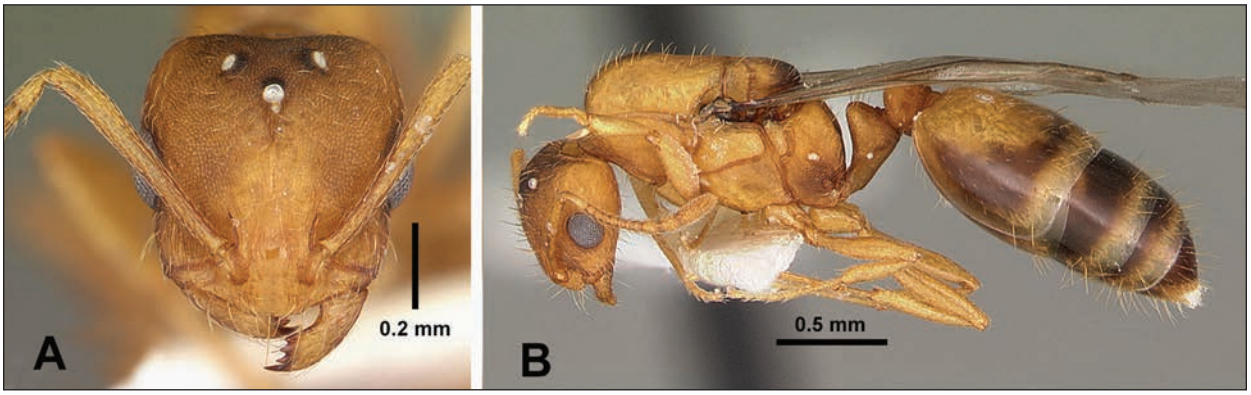


Figure 45. *Monomorium pharaonis* alate queen (A) full face view and (B) lateral view.

Male (Figure 46): Mayr described the male in 1865, but the only measurement he provided was that it was 3.0 mm long. The type was photographed by Antweb.org, and the following identification information was garnered from viewing those photos. Head, mesosoma, waist, and gaster dark brownish-black; antennae pale yellow; coxae, and tibia light brown; and femora pale yellow-brown. Head slightly wider than long; entire head in full face view with foveolate sculpture; scattered short, semierect setae present; eyes large, about half the head length; ocelli present, not noticeably elevated; antenna 13-segmented (including scapes); scape about length of funicular segments 2+3; mandibles present, simple. Mesosoma with light foveolate sculpture except for mid region of mesopleuron, which is smoother, and shiny; mesosomal dorsum with scattered, short semierect setae. Wings transparent; veins with little pigmentation, distal segments reduced to vestigial lines; m–cu absent; cu–a absent. Waist with a few, short, setae, directed posteriorly; petiolar peduncle thickened, node triangular in lateral view, strongly pitted with small fovea; petiole rounded in lateral and dorsal views, with numerous small fovea present. Gaster mostly lacking sculpture except for light reticulation on anterior region of first tergite, otherwise, smooth and shining; with scattered short, semierect to erect setae, especially dorsally, and with a patch of more dense, longer setae on posterior sternites.

Biology

Monomorium pharaonis is a widespread species that is suspected to inhabit most, if not all, large cities in the U.S. (Wetterer 2010b). Colonies are polygynous, and even though some winged females are produced, they spread through budding.

Pest Status

The pharaoh ant is considered to be a serious house-infesting ant species in the U.S. As these ants are omnivorous, any available food will sustain a colony, though they appear to prefer greasy, fatty foods and meats (Smith 1965). This species may be found inhabiting houses and buildings, where they are often detected from their intricate foraging trails. This species is considered a pest in hospitals, where it is known as a vector for disease (Beatson 1972). Workers of *M. pharaonis* may be attracted to electricity (as is apparently the case with numerous other ant species) and may cause electrical disruption by shorting out circuits (MEM data, Pers. Obs. JAM).

Distribution

Monomorium pharaonis is thought to be native to Asia (Wetterer 2010b). In the U.S., this species has been reported from Alabama, Arkansas, Arizona, California, Florida, Georgia, Hawaii, Illinois, Louisiana, Missouri, Mississippi, North Carolina, New Mexico, Ohio, Pennsylvania, South Carolina, Tennessee, Texas, and Washington (AntWeb.org and MEM data). MEM records from Mississippi include Hinds, Jackson, Oktibbeha, Pontotoc, and Warren Counties (Map 14).

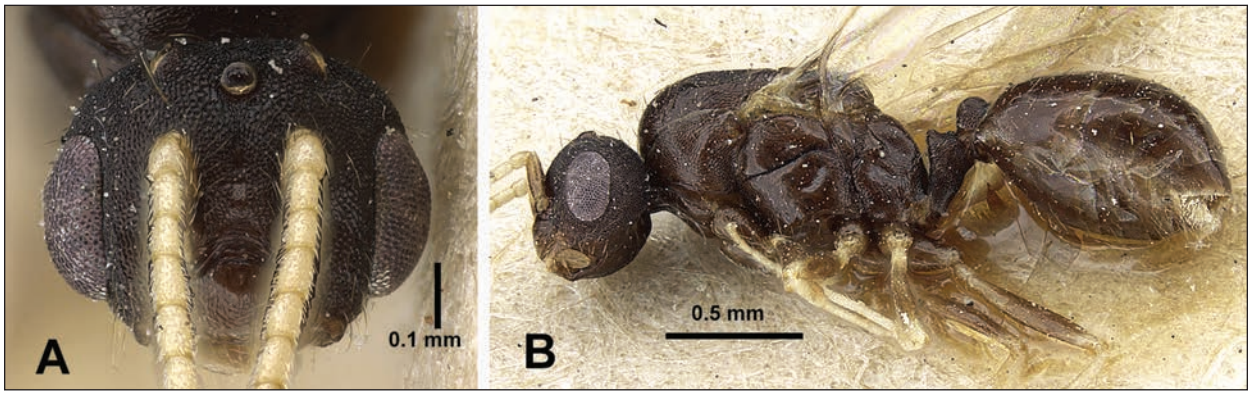


Figure 46. *Monomorium pharaonis* male (A) full face view and (B) lateral view (photo from Antweb.org).

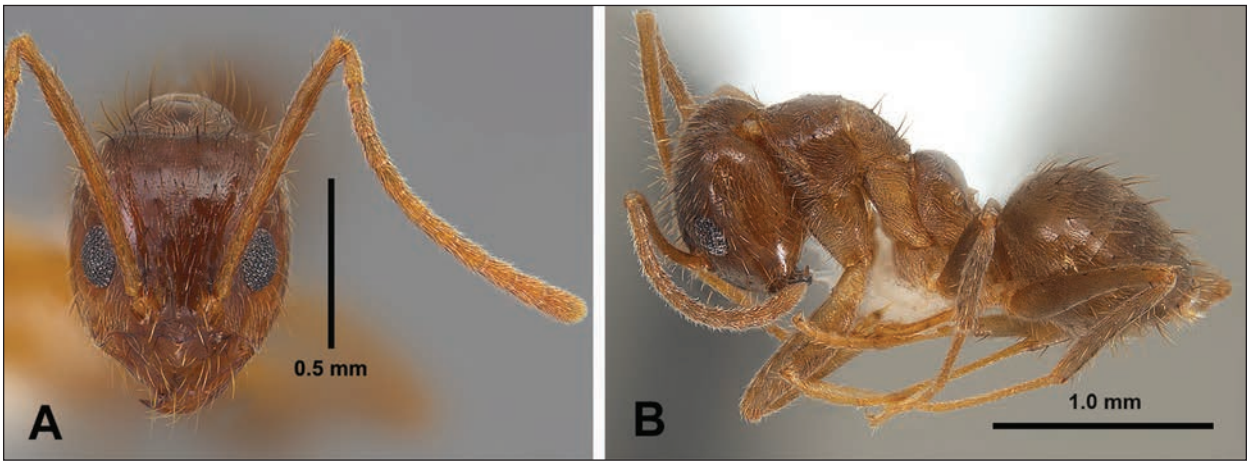


Figure 47. *Nylanderia fulva* worker (A) full face view and (B) lateral view.

Summary

Nylanderia fulva (Mayr) (Formicinae) is a small, reddish-brown species native to South America (Kumar et al 2015). This species forms huge super colonies and is now a serious nuisance pest in some areas in the South. It is apparently attracted to electricity and is known to cause disruption in electrical systems.

Diagnosis

Workers of *Nylanderia fulva* can be recognized by their small size (TL ≈ 2.0-2.5 mm), reddish-brown color; shiny integument with dense, fine pubescence and long, flexuous macrochaetae on head, promesonotum and gaster; 12-segmented antennae with long scapes, single petiolar node, and an acidopore at the gastral apex. Workers of *N. fulva* are very difficult to distinguish from the related *N. pubens* (Forel), and for accurate differentiation between these two species, males are needed. Males of *N. fulva* have elongate, flexuous setae of uneven lengths and orientation on the borders of the parameres of the genitalia; whereas, in *N. pubens,* the pilosity on the parameres is arranged in a definite fan-like pattern. In the U.S., *N. pubens* is only known from southern Florida (Trager 1984) and has not been reported in recent years. Only two other species of *Nylanderia* in the South have dense pubescence on the mesosoma: *N. bourbonica* (Forel) and *N. guatemalensis* (Forel). Workers of *N. bourbonica* are larger, concolorous dark brown, and have ocelli, and workers of *N. guatemalensis* are yellowish-brown and have a glabrous pronotal disk, with the sides of pronotum usually glabrous as well. The longhorn crazy ant (*Paratrechina longicornis* (Latreille), another related species that makes super colonies, can be distinguished from tawny crazy ants by its brown color, long slender body, and extremely long legs and antennae. Tawny crazy ants can be recognized in the field by their extremely large populations, uniform size of workers, reddish-brown coloration, and rapid, erratic movement.

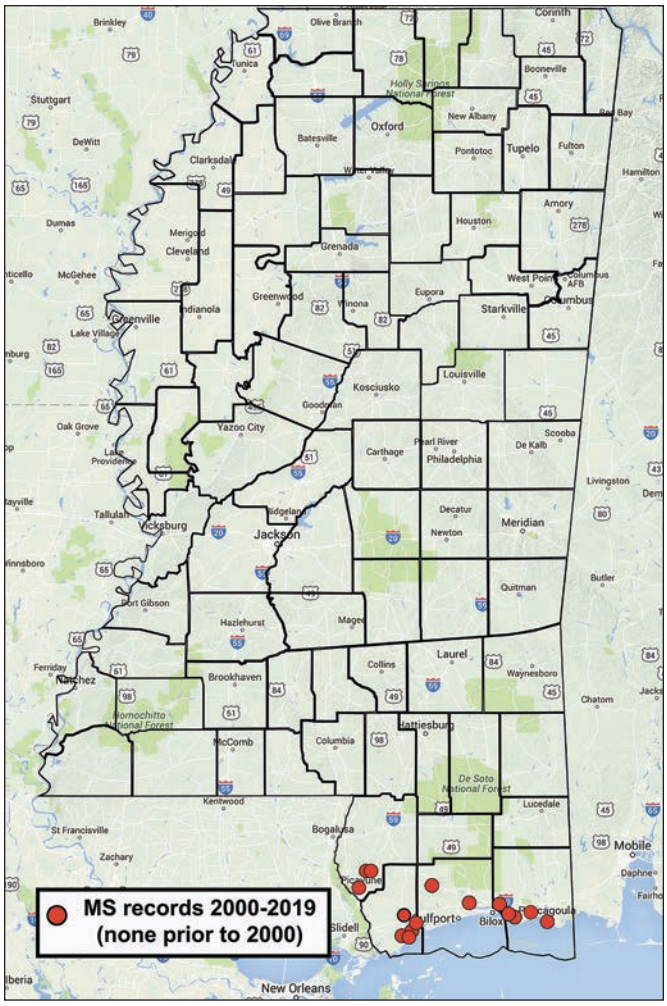
Descriptions

Worker (Figure 47): Small (HL 0.75–0.80 mm, HW 0.61–0.70 mm, SL 0.87–0.94 mm, EL 0.20–0.21 mm, MeSL 0.93–1.02 mm) (n=5, MEM specimens). Orangish-brown to reddish-brown. Head longer than wider, rounded rectangular, widest at midpoint; somewhat shiny with numerous appressed short setae and long, thick erect macrochaetae; eyes large, about 1/4 of the length of the head, located about midway between posterior and anterior edges of head; ocelli lacking; antennae 12-segmented, lacking club; scapes long, with numerous, erect, stout, black, setae present; mandibles with six distinct teeth. Mesosoma with promesonotum distinctly set off from propodeum with deep metanotal groove, with a dome-shaped gland on either side on the midline of groove; entire mesosoma with dense, short, appressed setae; promesonotal dorsum with several long, flexuous, erect macrochaetae; propodeum lacking spines but with a flange-like protrusion where a spine would be. Waist is single-segmented, petiolar node erect, tapering apically to a point, shiny. Gaster often overhangs petiolar node; overall shiny, with dense appressed setae that do not dull appearance; numerous long, flexuous, erect setae; acidopore present at the apex.

Queen (Figure 48): Larger than workers (HL 0.95–0.96 mm, HW 0.96–0.98 mm, SL 1.03–1.04 mm, EL 0.35–0.37 mm, MeSL 1.64–1.65 mm) (n=2, MEM specimens). Head and body brown to reddish-brown, antennae and legs often lighter orangish-brown. Head about as wide as long, widest

posteriorly; posterior border straight; entire with dense, appressed, short setae, with scattered longer erect setae; eyes large, about 1/3 the length of the head, located laterally along the midline; three ocelli present; antennae 12-segmented, lacking a club, scapes long, lacking stout, erect setae; mandibles with six distinct teeth. Mesosoma enlarged and with four wings or wing scars; dorsum flattened; entire mesosoma with dense, appressed, short pubescence; numerous, erect setae present dorsally; propodeum unarmed. Waist single-segmented, petiolar node mostly shiny. Gaster overhangs petiolar node; with dense, appressed, short pubescence, and numerous longer, erect setae; acidopore present at the apex.

Male (Figure 49): Small, about the same size as workers (HL 0.60–0.66 mm, HW 0.50–0.54 mm, SL 0.77–0.80 mm, EL 0.27–0.30 mm, MeSL 1.02–1.08 mm) (n=5, MEM specimens). Orangish-brown to reddish-brown. Head slightly longer than wide, somewhat circular; with numerous appressed, setae curving toward midline; several erect, stout, black macrochaetae present, especially posteriorly; eyes very large, about 1/2 the length of head, located on lower portion of head; three large ocelli present; antennae 13-segmented, lacking a club, scapes very long; mandibles with a slight notch at the apex forming one tooth followed by a long edentate section. Mesosoma slightly convex in lateral view; pronotum trapezoidal, slightly convex anteriorly; mesoscutum rounded anteriorly; propodeum angled about 45∞; entire mesosoma with dense, short pubescence and scattered erect macrochaetae dorsally. Wings transparent yellow-gray; forewing with closed costal, basal, subbasal, marginal and submarginal cells; pterostigma



Map 15. *Nylanderia fulva* site records in Mississippi based on MEM specimens.

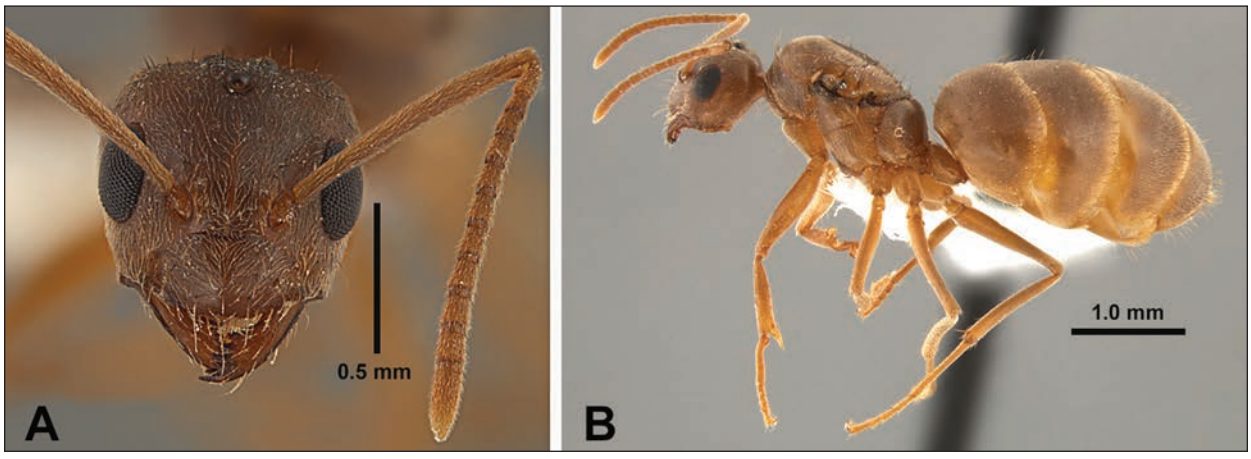


Figure 48. *Nylanderia fulva* dealate queen (A) full face view and (B) lateral view.

present hindwing with closed basal cell. Waist single-segmented, petiolar node thickened basally, rounded triangular, shiny. Gaster overhangs petiolar node; entire gaster with dense, short, appressed pubescence and numerous longer erect setae; genitalia external with well-developed triangular parameres; parameres with elongate, flexuous setae of uneven lengths and orientation.

Biology

Nesting Info: Individual colonies and groups of colonies are polygynous, with nests typically found in rotting wood, in soil, in and under various types of debris and landscape objects, under mulch, under bark, in potted plants, in vehicles, and in structures. Colonies are less active during cool months; however, populations build rapidly in the spring and increase in size throughout the summer and fall. Based on searches of beach sites along the Mississippi coastline and on West Ship Island, we have found that this species does not appear to prefer beach-like habitat, but it is more prevalent in areas with cover and large quantities of food.

Food Resources: Tawny crazy ant workers tend various hemipterous insects (aphids, mealybugs, scale insects, treehoppers, whiteflies, etc.) for honeydew and are also attracted to plant nectaries, damaged or overripe fruit, and other sweet food sources. They supplement their diets with arthropods and small vertebrates for protein (Drees 2009, MacGown and Layton 2010, Meyers 2008).

Pest Status

In the U.S., the tawny crazy ant has become a serious nuisance species. Incredibly large populations have proven difficult to control with conventional baits (MacGown and Layton 2010). Tawny crazy ants may reduce biodiversity of other animals, both invertebrate and vertebrate. LeBrun et al. (2013) reported that tree-nesting birds and other small animals have been forced to move out of areas inhabited by large populations of tawny crazy ants. Large accumulations of tawny crazy ants have been reported to cause short circuits and to clog switching mechanisms, which has resulted in electrical shortages in a wide variety of equipment such as breaker boxes, electrical outlets, phone lines, air conditioning units, chemical-pipe valves, computers, security systems, cars, sewage lift pump stations, electrical systems in automotive vehicles, and numerous other devices (Drees 2009, Pagad 2011, Meyers 2008b).

Distribution

Nylanderia fulva is native to South America (Kumar et al. 2015). In the U.S., populations are established in Alabama, Florida, Louisiana, Georgia, Mississippi, and Texas with historic records from Illinois and D.C. (likely indoor populations that did not become established). MEM records from Mississippi include Hancock, Harrison, Jackson, and Pearl River Counties (Map 15).

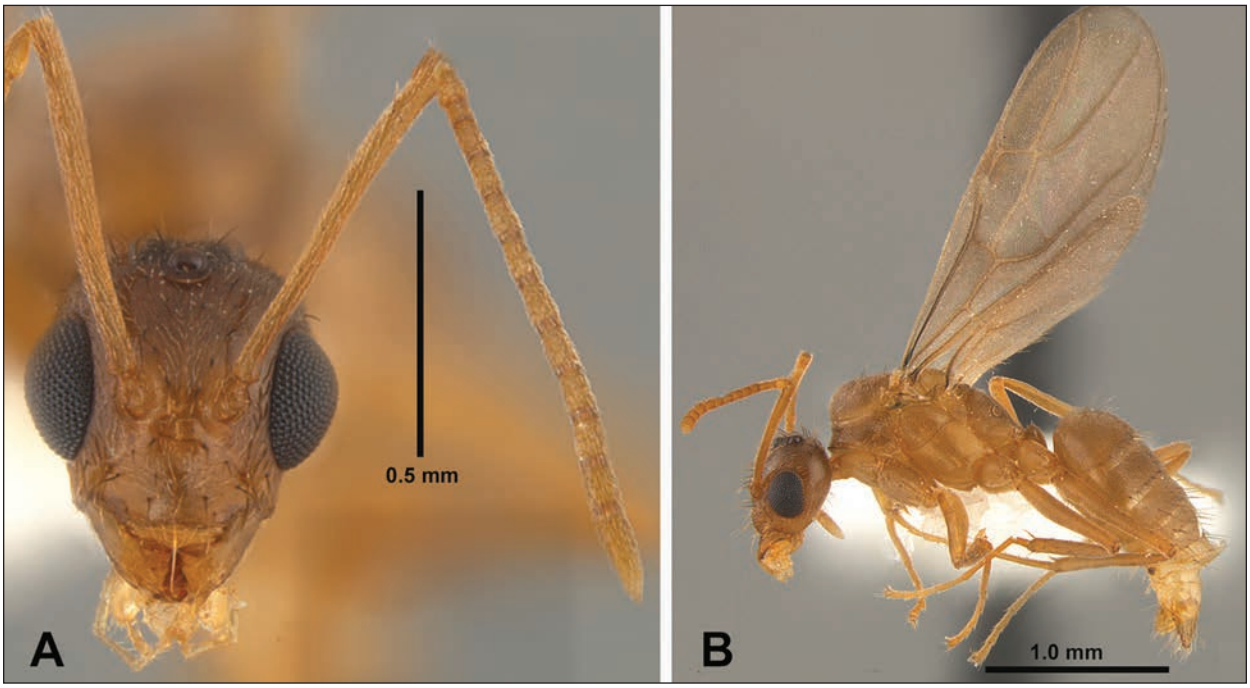


Figure 49. *Nylanderia fulva* male (A) full face view and (B) lateral view.

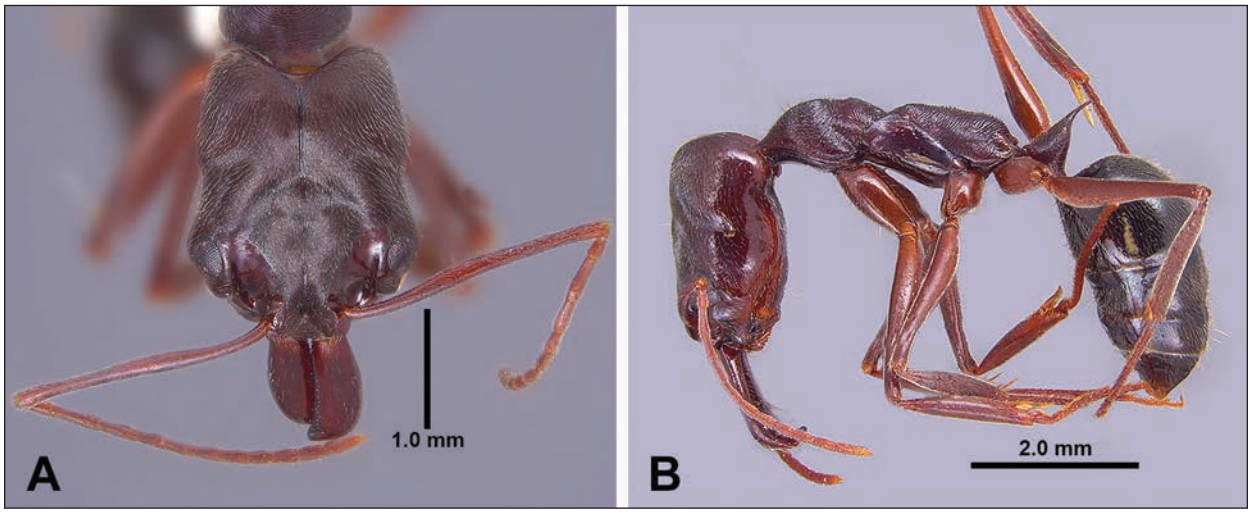


Figure 50. *Odontomachus haematodus* worker (A) full face view and (B) lateral view.

Summary

Odontomachus haematodus (Linnaeus) (Ponerinae) is a large, dark-colored species native to South America (MacGown et al. 2014) that has recently become established along the U.S. Gulf Coast from northern Florida to southern Louisiana. Based on large populations, apparent successful competition with native species that nest in the same habitat, and its painful sting, this species shows invasive potential in the U.S.

Diagnosis

Odontomachus workers in the U.S. can be easily recognized by their large size (TL ≈ 9.0–11 mm), elongate, snapping mandibles that arise from the middle of the posterior portion of the head, the one-segmented petiole that terminates in a spine, and an obvious sting. Workers of *O. haematodus* can be separated from other species in the Southeast by their large size, paired metasternal spines, and transverse striae on most of the petiole (reduced or lacking posteriorly except at base). Males are yellow with small ocelli that are not raised. A similar species, *O. ruginodis* Smith, is much smaller on average, striae completely covers the petiole, lacks metasternal spines, and is confined to southern Florida in the U.S. Males of *O. ruginodis* are yellowish with a dark-brown propodeum and brownish gaster. Workers of other U.S. species do not have transverse striae on the petiole.

Descriptions

Worker (Figure 50): Large (HL 2.32–2.75 mm, HW 1.88–2.16 mm; SL 2.2–2.48 mm, EL 0.46–0.54 mm, ML 1.38–1.56 mm, PTH 1.22–1.38 mm, PTL 0.54–0.60 mm, MeSL 3.04–3.48 mm) (n=10, MEM specimens). Entire body dark reddish-brown with gaster often darker brownish-black and antennae and legs orangish-brown. Head longer than wide; anterior corners strongly lobed, forming a deep, triangular depression in middle of posterior border; head somewhat constricted near midpoint, widened anteriorly at eye placement, then narrowing to the straight anterior border of clypeus; fine, longitudinal striae covering much of the head in full-face view, striae beginning from frontal lobes and diverging toward posterior corners of head, fading at corners and sides; sides and underside of head lacking sculpture; with numerous, fine, appressed pubescence and scattered elongate, erect setae present (dorsally); eyes large, located at lower third of head at widest point; three small ocelli present; antenna 12-segmented, lacking club; scape about as long as head, lacking erect setae except apically; frontal lobes close together, expanded to cover antennal insertions; clypeus reduced, anterior border straight; mandibles elongate, thickened, with denticles along inner border and two longer blunt, inward turned, apical teeth. Mesosoma somewhat narrowed; promesonotum distinctly set off from propodeum; pronotum with somewhat circular concentric striae that become longitudinal near rear margin; appressed pubescence abundant; five to eight elongate, erect setae present. Mesonotum and propodeum with deep transverse striae; propleuron, mesopleuron, and basalar lobe lacking sculpture; with abundant pubescence present dorsally. Metasternum with paired narrowed, elongate,

spiniform processes between hind coxae. Waist single-segmented, petiolar node widest at base, gradually tapering apically to a long spine directed rearward; transverse striae completely surrounding petiole except upper dorso-posteriorly where striae are faint or lacking; subpetiolar process somewhat anvil shaped; appressed pubescence present anteriorly and laterally but mostly absent posteriorly. Gaster mostly shiny beneath pubescence, lacking striae or other strong sculpture, but weakly shagreened (seen at high magnification); fine, appressed pubescence moderately dense, spaces between hairs usually less than 1/2 the length of a hair; scattered erect, elongate setae present; sting present.

Queen (Figure 51): Large, slightly larger than worker (HL 2.48–2.55 mm, HW 2.14–2.00 mm, SL 2.35–2.36 mm, EL 0.52–0.55 mm, ML 1.56–1.58 mm, OL 0.12–0.13 mm, PTH 1.28–1.62 mm, PTL 0.58–0.66 mm, FWL 6.5 mm, MeSL 3.56-3.60 mm) (n=2, MEM specimens). Entire body dark reddish-brown with gaster often darker brownish-black and antennae and legs orangish-brown. Head longer than wide; anterior corners strongly lobed, forming a triangular depression in middle of posterior border; head somewhat constricted near midpoint, widened anteriorly at eye placement, then narrowing to the straight anterior border of clypeus; fine, longitudinal striae covering much of the head in full-face view, striae beginning from frontal lobes and diverging toward posterior corners of head, fading at corners and sides; sides and underside of head lacking sculpture; with numerous, fine, appressed pubescence and scattered elongate, erect setae present (dorsally); eyes large, located at lower third of head at widest point; antenna 12-segmented, lacking club; scape about as long as head, lacking erect setae except apically; frontal lobes close together, expanded to cover antennal insertions; clypeus reduced, anterior border straight; mandibles elongate, thickened, with denticles along inner border and two longer blunt, inward turned, apical teeth. Mesosoma not constricted, in lateral view, somewhat convex dorsally, with numerous short erect, setae dorsally, especially on pronotum; pronotum rounded anteriorly in dorsal view with circular concentric striae that become longitudinal near rear margin; mesoscutum with dense, longitudinal striae; mesoscutellum shiny, lacking sculpture; propodeum broadly rounded, with deep transverse striae; mesopleuron, and basalar lobe, shiny, lacking sculpture. Metasternum with paired narrowed, elongate, spiniform processes between hind coxae. Wings with light brownish tint; forewing with closed costal, basal, subbasal, two discal, two submarginal, and marginal cells; medial vein extending to wing tip; pterostigma present; hindwing venation with closed basal and subbasal cells. Waist single-segmented, petiolar node widest at base, gradually tapering apically to a long spine directed rearward; transverse striae completely surrounding petiole except upper dorso-posteriorly where striae are faint or lacking; subpetiolar process somewhat anvil shaped; appressed pubescence present anteriorly and laterally, but mostly absent posteriorly. Gaster mostly shiny beneath pubescence, lacking striae or other strong sculpture, but weakly shagreened (seen at high magnification); fine, appressed pubescence moderately dense, spaces between hairs usually less than 1/2 the length of a hair; scattered erect, elongate setae present; sting present.

Male (Figure 52): Smaller than worker (HL 1.00–1.12 mm, HW 1.20–1.30 mm, SL 0.18–0.20 mm, EL 0.62–0.68 mm, EW 0.38–0.40 mm, OL 0.18–0.20 mm, OES 0.20–0.22 mm, PTH 0.90–0.94 mm, PTL 0.50–0.56 mm, FWL 4.95–5.45 mm, MeSL 2.68–2.83 mm)

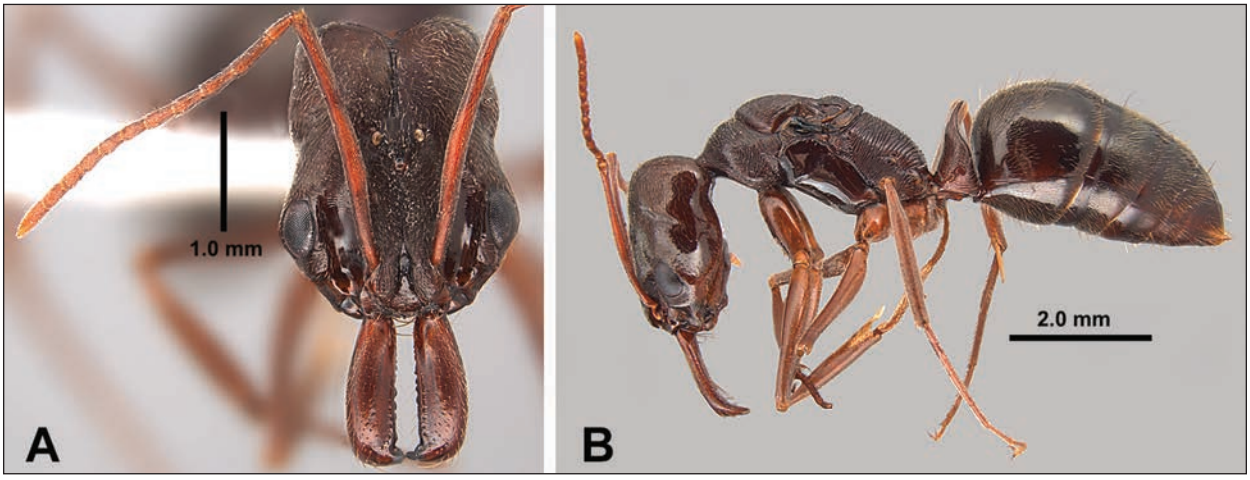
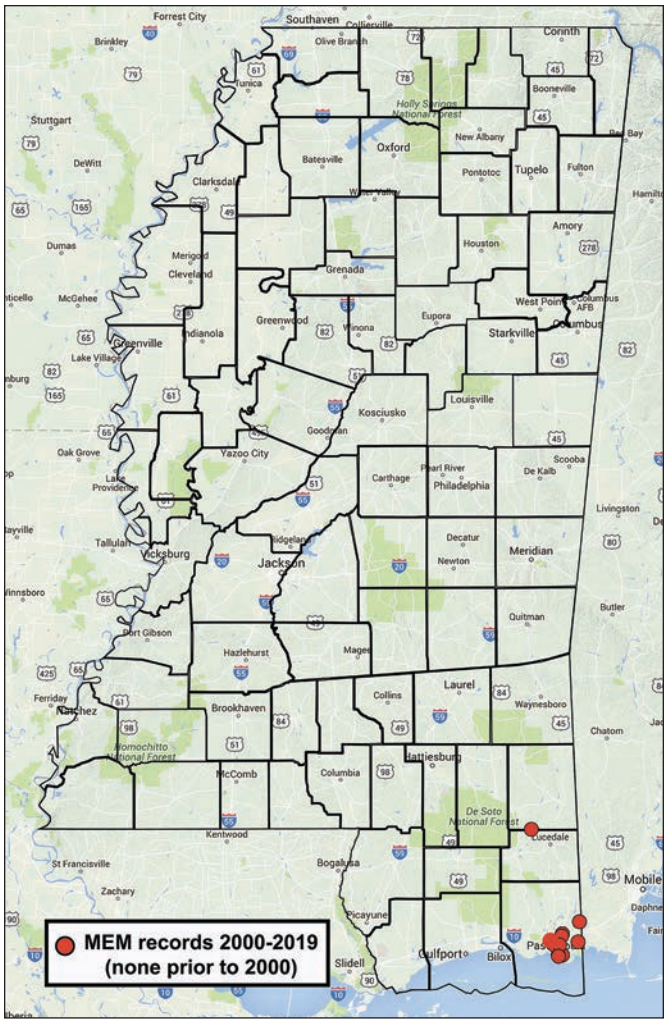


Figure 51. ***Odontomachus haematodus*** **dealate queen (A) full face view and (B) lateral view.**

(n=5, MEM specimens). Body orangish-brown to brown, antennae and legs lighter orangish-brown. Head slightly wider than long (including eyes), somewhat elliptical, shiny, with numerous appressed, short setae; eyes extremely large, eye length about 70% of the length of the head; ocelli small to average in size, the length of each ocellus slightly less to approximately the same as the distance between lateral ocellus and eye margin; in full-face view, lateral ocelli do not protrude beyond posterior border of head; antenna 13-segmented, not clubbed, lacking erect setae, scape short and rectangular, pedicel short and square, flagellomeres elongate and subequal to one another; mandibles reduced, lacking dentition. Mesosoma thickened, with dense, fine pubescence except on anepisternum; pronotum with faint transverse striae, especially laterally, but mostly lacking sculpture; mesoscutum with faint transversely arcuate striae anteriorly, striae becoming transverse posteriorly; mesoscutellum raised and convex, lacking sculpture; propodeum evenly rounded without obvious declivious face, with strong rugoreticulation; mesopleuron mostly lacking striae or with very faint longitudinal striae. Wings with light brownish tint; forewing with closed costal, basal, subbasal, two discal, two submarginal, and marginal cells; medial vein extending to wing tip; pterostigma present; hindwing venation with closed basal and subbasal cells. Waist single segmented; petiole bluntly rounded apically, with rounded triangular subpetiolar process anteriorly; densely pubescent anteriorly and laterally, but reduced pubescence posteriorly. Gaster shiny beneath dense, fine, white pubescence,



Map 16. *Odontomachus haematodus* site records in Mississippi based on MEM specimens.

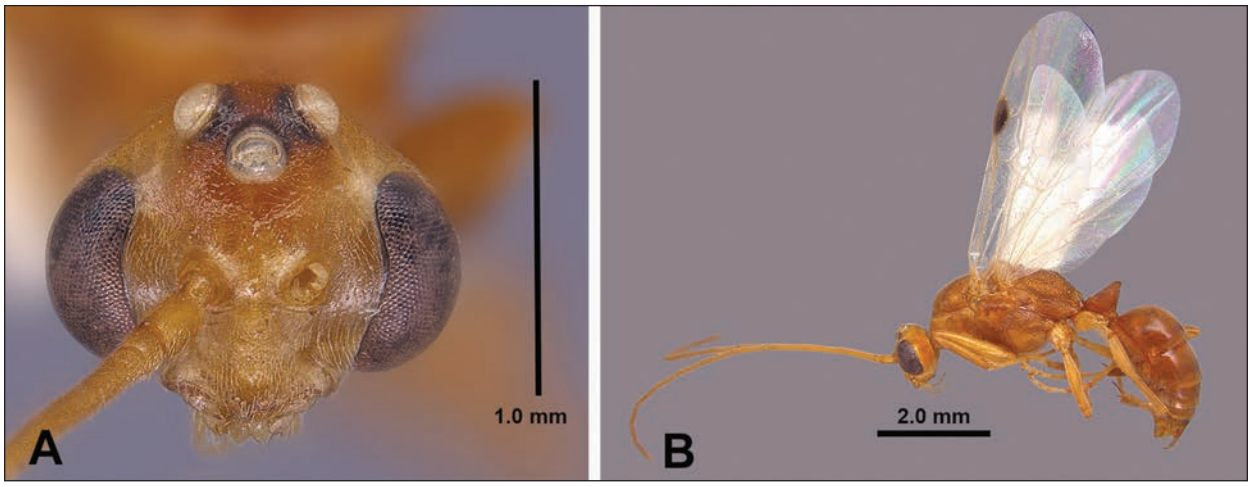


Figure 52. *Odontomachus haematodus* male (A) full face view and (B) lateral view.

with a few scattered longer, erect setae at sclerite margins; curved, ventrally projecting spine present at apex of last tergite.

Biology

This species has been collected in lowland rainforests, grasslands, wet forests, and at port of entries (AntWeb, 2019, MEM data). In southern Alabama, Florida, and Mississippi, this species can easily be found nesting in rotting wood, in soil under rotting wood, and in cavities in trees. Although this species is often located in habitats with sandy soils, soil type is probably not overly important as it often nests in leaf litter, rotting wood, or in trees, rather than directly in the soil. I have frequently collected *O. haematodus* nesting side by side with the introduced *Pheidole navigans* Forel. Thus far, the distribution of *O. haematodus* in the U.S. does not appear to overlap with *O. ruginodis* Smith which ranges from Alachua County, Florida, to southern Florida. Alate males and females have been collected from late June through early August.

Pest Status

In areas where *O. haematodus* colonies are abundant, they may outcompete native ant species for resources, and along the Alabama and Mississippi Gulf Coast, they appear to replace *Camponotus* and *Aphaenogaster* species that nest in rotting wood in natural settings. Compared to native species of *Odontomachus* in the U.S., *O. haematodus* is an aggressive stinger. Upon placing one's hand in leaf litter where a nest is located, workers are quick to sting, which is painful but short-lived. Complaints have been received from homeowner's in southern Mississippi of this species biting and stinging them. One homeowner stated, "Ants would latch on with their mandibles and sting repeatedly, lashing out with their abdomens. One ant can sting four to five times before you realize it. They are very aggressive." The veracity of these claims has been confirmed by coauthor MacGown, who has been stung by this species on numerous occasions.

Distribution

Brown (1976) reported its distribution as continental South America from Orinoco Delta to Tucuma, Argentina. Records from the U.S. include Alabama (Baldwin, Escambia, and Mobile Counties), Florida (Escambia County), Louisiana (Orleans Parish), and Mississippi (Greene and Jackson Counties) (MEM records) (Map 16).

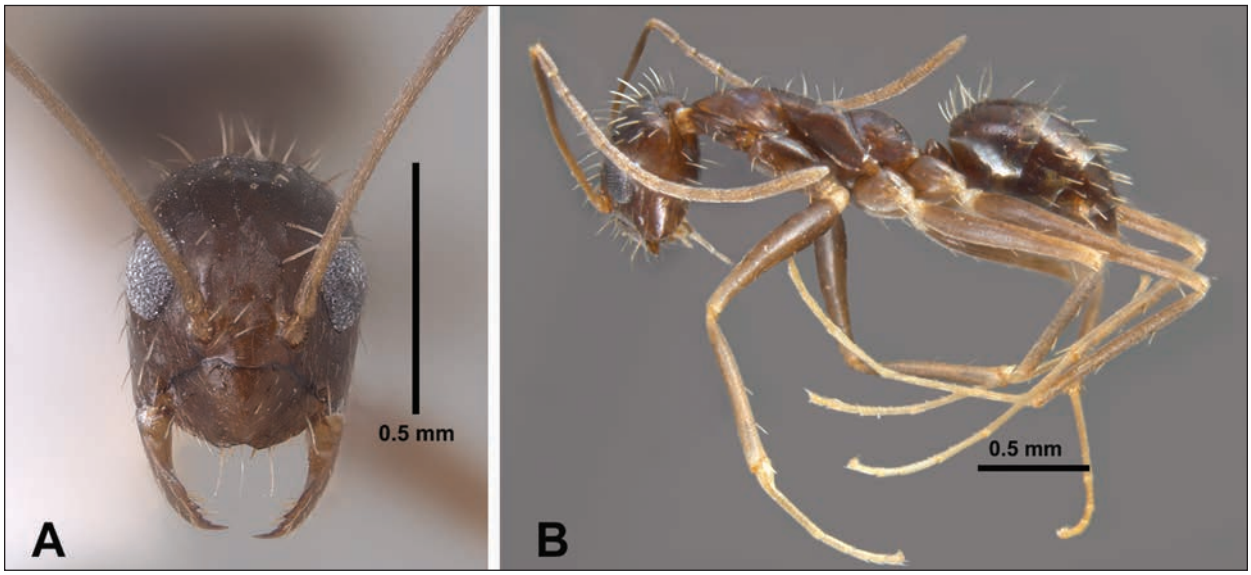


Figure 53. ***Paratrechina longicornis*** **worker (A) full face view and (B) lateral view.**

Summary

Paratrechina longicornis (Latreille), (Formicinae) is a small, elongate, long-legged, dark-brown ant thought to be native to either Asia or less likely Africa, though this is not certain (Wetterer 2008). This pantropical species is the only member of the genus found in North American, where it may be an occasional nuisance pest. It is believed to have first entered the U.S. through Florida and subsequently spread across the Gulf Coast and other Southern states with occasional reports of the species from indoor infestations in Northern states (Wetterer 2008).

Diagnosis

Workers of *Paratrechina longicornis* can be recognized by their dark-brown color, shiny integument, small slender body (TL ≈ 2.5 mm), numerous long erect white setae on the head and body, large eyes, presence of three minute ocelli, exceedingly long antennae and legs, single petiole, and acidopore at gastral apex. This species differs from related *Nylanderia* species by the proportionally longer antennae and legs.

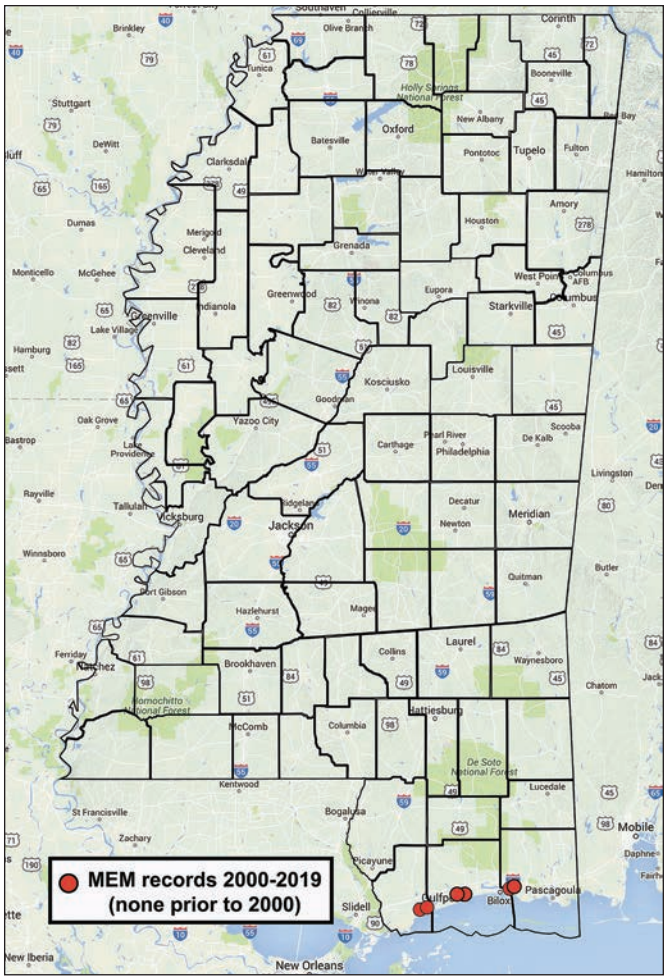
Descriptions

Worker (Figure 53): Small (HL 0.67–0.72 mm, HW 0.49–0.51 mm, SL 1.16–1.19 mm, EL 0.19–0.21 mm, MeSL 0.95–1.06 mm) (n=5, MEM specimens). Head and body dark brown to brownish-black with iridescent blueish reflections; antennae, coxae, femora, and tibia slightly lighter brown; and tarsi pale yellow-brown to light brown. Head longer than wide, ovoid; with faint reticulate sculpture; numerous elongate, coarse, white macrochaetae present, especially posteriorly and along edges of head; eyes large, length about 1/3 the length of the head, distinctly convex, located at about the midpoint of head; three minute ocelli present (difficult to see at low magnification); antennae 12-segmented, elongate, lacking club, lacking erect macrochaetae; scape elongate, about twice as long as head length; clypeus convex, anterior border rounded, notched medially; mandibles somewhat sickle-shaped in frontal view, parallel sided in lateral view, with five teeth near apex; maxillary palps long, six-segmented. Mesosoma slender, somewhat flattened dorsally, shiny, with light shagreening, with several, coarse, erect white setae present on promesonotum, and sparse, appressed, hair-like setae; propodeum broadly rounded in lateral view, lacking spines. Legs very long, hind femur length about equal to mesosomal length, femora and tibia with scattered erect setae. Waist single segmented; petiolar node relatively short with a flat anterior face and an anteriorly sloped posterior face. Gaster shiny, with light shagreening, numerous elongate, coarse, white macrochaetae present; small acidopore present at apex.

Queen (Figure 54): Average sized, about twice the size of workers (HL 1.06 mm, HW 1.03 mm, SL 1.40 mm, EL 0.39 mm, MeSL 1.92 mm) (n=1, MEM specimens). Head and body dark brown; fore coxae, femora,

and tibia brown; antennae, mid and hind coxae, trochanters, and tarsi yellowish-brown. Head about as long as wide, squarish; finely shagreened beneath dense, short, appressed, fine, pubescence; longer erect setae absent; eyes large, about 1/3 the length of the head, located near midline of the head; three ocelli present; antennae 12-segmented, elongate, lacking club, lacking erect macrochaetae; scape elongate, about 1.5 times head length; clypeus convex, anterior border broadly rounded, shallowly notched medially; mandibles triangular, with five distinct teeth; maxillary palps long, six-segmented. Mesosoma robust, lightly shagreened beneath dense, short, appressed, fine, pubescence; longer, erect setae absent; pronotum rectangular in lateral view; propodeum lacking spines, declivity gently sloped. Wings with dusky yellow-brown tint; forewing with closed costal, basal, and marginal cells. Waist single segmented; petiolar node short in comparison to the gaster and often obscured by the anterior edge of the gaster in the dorsal view. Gaster covered in dense pubescence; lacking sting; acidopore present at apex.

Male (Figure 55, description based on antwiki.org pictures): Head, antennal scapes, femora, and tibia brown; mesosoma, waist, petiole, funiculi, coxae, and tarsi yellowish-brown; gaster dark brown; legs, especially joints, lighter colored than the body. Head about as long as wide, spherical; weakly shining with very faint reticulation; sparse, short, hair-like setae present, especially anterior to eyes; a few coarse, long, erect macrochaetae present; eyes distinctly convex, large,



Map 17. *Paratrechina longicornis* site records in Mississippi based on MEM specimens.

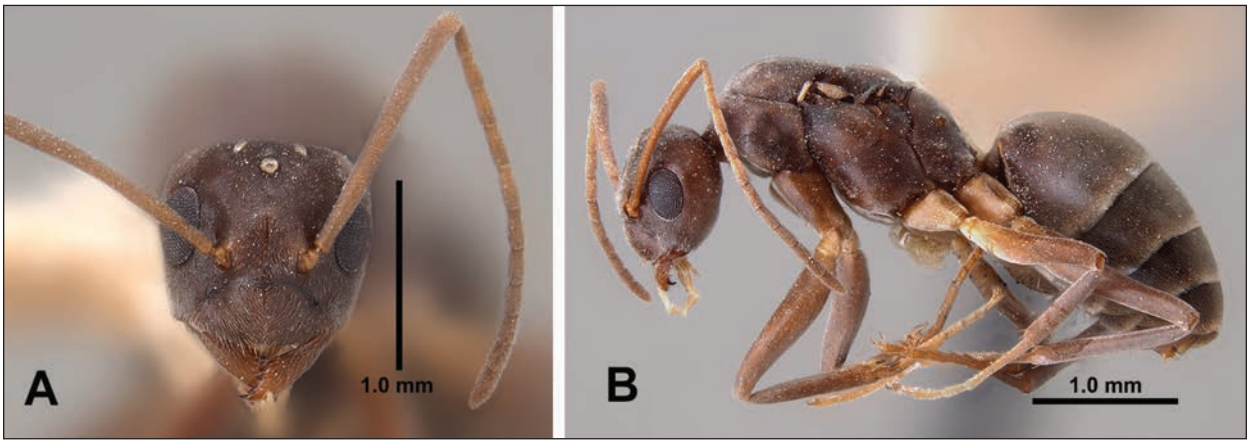


Figure 54. *Paratrechina longicornis* dealate queen (A) full face view and (B) lateral view.

about 1/3 the length of the head, located at the midpoint of the head; three ocelli present; antennae 13-segmented, elongate, lacking club, scape elongate; clypeus broadly rounded, anterior border straight to very slightly concave; mandibles reduced; maxillary palps long and six-segmented. Mesosoma mostly glabrous and shining with some coarse, erect setae; dorsum smoothly curved from mesoscutum to base of propodeum. Wings with light grayish-brown tint; forewing with closed costal, basal, and marginal cells. Waist single segmented; petiolar node triangular from lateral view. Gaster shining, mostly glabrous except for a few scattered, appressed fine setae; numerous long, erect setae present, especially at sclerite margins and apically; genitalia present at apex, parameres somewhat squared in ventral view, penivalva extend beyond volsella.

Biology

Paratrechina longicornis is perhaps the most broadly dispersed ant species in tropical and semitropical habitats with records in both the Old World and New World and both northern and southern hemispheres (Wetterer 2008). Wetterer considered this widespread range to be related to its ability to inhabit disturbed environments and coexist with humans. Additionally, *P. longicornis* has been able to expand its range into nontropical environments by inhabiting heated buildings. Outdoor nests can be found in mulch, rotten wood, and tree cavities, as well as under other objects found on the ground. This species produces super colonies, which may be huge with multiple queens. These ants are general scavengers and are attracted to sugary foods and baits, and this species is known to tend honeydew producing Hemipterans. In the Southeast, *P. longicornis* has been collected from September to April and is one of the most commonly found ants in heated buildings during the winter months.

Pest Status

Paratrechina longicornis is considered to be a nuisance pest species due to its tendency to forage and nest in homes and buildings and the ease by which humans transport it. This ant is adept at locating food sources and will readily feed on common household foods, including meat, sweets, vegetables, and fountain soda syrups (Smith 1965). Due to huge populations formed from *P. longicornis* super colonies, this species may have a negative effect of native species of ants and other arthropods. As with other super colonial species, control is difficult.

Distribution

The origin of this species is unclear, but it is thought to be native to Asia, or less likely Africa (Wetterer 2008). Records from the U.S. (including indoor records) include Alabama, Arizona, California, Florida, Georgia, Hawaii, Illinois, Indiana, Louisiana, Maryland, Missouri, Mississippi, North Carolina, New Mexico, New York, Oklahoma, Pennsylvania, South Carolina, Texas, and Virginia (MEM, Antweb.org, and Wetterer 2008). In Mississippi, this species is well established in Hancock, Harrison, and Jackson Counties (MEM) (Map 17).

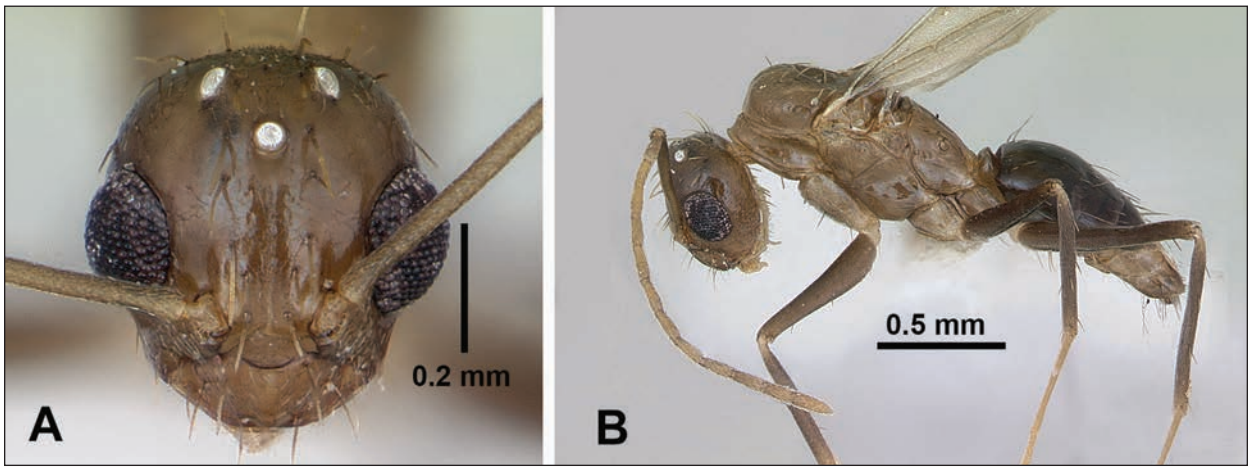


Figure 55. *Paratrechina longicornis* male (A) full face view and (B) lateral view (from Antweb.org, photo by April Nobile Specimen: CASENT0173231).

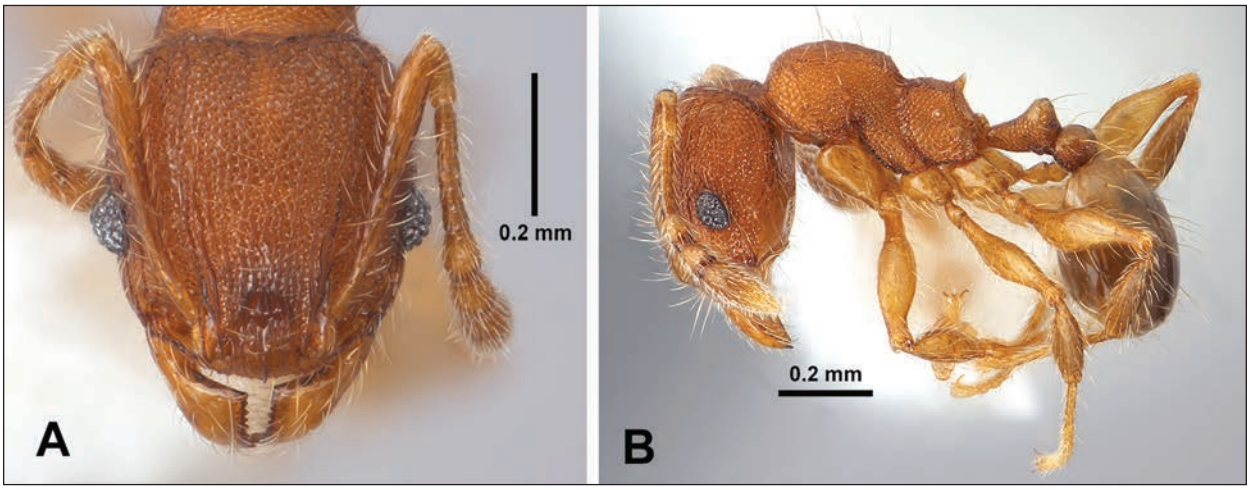


Figure 56. *Pheidole navigans* minor worker (A) full face view and (B) lateral view.

Summary

Pheidole navigans (Forel) (Myrmicinae) is a small, reddish-brown species thought to be native to the Neotropics (Sarnat et al. 2015). This species has become widespread and abundant along the Coastal Plain from southeastern Texas to eastern South Carolina. In Mississippi, this species is now well established in the southern third of the state.

Taxonomic Status

Until a recent paper on invasive *Pheidole* species of the world was published by Sarnat et al. in 2015, specimens of this species from the U.S. and the Caribbean were identified as *P. moerens* Wheeler. However, after examination of type specimens, Sarnat et al. (2015) removed *P. navigans* from synonymy with *P. flavens*, and after examining Southeast specimens, they proposed that U.S. and Caribbean specimens previously identified as *P. moerens* are actually *P. navigans.*

Diagnosis

Workers of *P. navigans* are dimorphic with major and minor castes. Both worker castes are small (TL ≈ 2.0–3.0 mm), reddish-brown to dark brown, have 12-segmented antennae with a three-segmented club, promesonotum elevated above propodeum, propodeum with small spines, waist with petiole and postpetiole, and sting is atrophied. Minor workers are smaller than major workers (especially head size), dark reddish-brown, and have dense foveolate sculpture on the face, mesosoma, and waist. They are similar to the related *P. bilimeki, P. flavens,* and *P. floridana,* but differ by having more striae on the face and usually having darker coloration. Major workers can be separated from *P. bilimeki* and *P. floridana* by their darker color (dark brown usually), having transverse striations on the pronotum (near the humeral area), striations on the head extending more near the occiput, and at least some rugoreticulation on the face between the eyes and frontal carina. Additionally, *P. navigans* seems to prefer nesting in rotting wood, whereas *P. bilimeki* and *P. floridana* typically nest in sandy soil. *Pheidole navigans* majors are distinguished from *P. flavens* by the broader smooth space of the occiput and feebler intercarinular foveolation on the head.

Descriptions

Minor Worker (Figure 56): Small (HL 0.49–0.51 mm, HW 0.44–0.47 mm, SL 0.42–0.43 mm, EL 0.08–0.10 mm, MeSL 0.67–0.74 mm, SPL 0.08–0.10 mm, PetW 0.13–0.14 mm, PPW 0.18–0.22 mm, PronW 0.42–0.45 mm) (n=5, MEM specimens). Overall reddish-brown to dark brown with gaster sometimes darker brown, legs orangish-brown. Head slightly longer than wide; foveolate, with rugulae present from anterior margin of head (including clypeus) to just posterior of eyes (occasionally extending almost to posterior margin of head on sides of head); and with limited, loose rugoreticulation between eye and frontal carina; scattered semierect to erect, flexuous, somewhat thickened setae scattered over the entire surface of head and mandibles, similar setae present on antennal scapes; eyes relatively small (six to eight ommatidia in longest view), located about midpoint of the head at edges (in full face view), ocelli lacking:

antennae 12-segmented, with three-segmented club, scape barely surpassing posterior margin of head; mandibles triangular, with six to seven small teeth along inner border and longer apical tooth. Mesosoma with dense foveolate sculpture; mesosomal dorsum with scattered flexuous setae of varying lengths, more numerous on promesonotum; promesonotum fused, in profile dorsum appearing as a continuous arced shape; metanotal groove prominent; propodeum, angular, distinctly set below level of promesonotum; propodeal spines present, triangular, slightly upturned. Waist two-segmented: Petiole about twice as long as wide (dorsal view), petiole pedunculate, node raised, conical in lateral view, almost circular in dorsal view; sides of petiole foveolate, dorsum shiny. Postpetiole about as wide as long (dorsal); appearing circular in both lateral and dorsal views; some foveolate sculpture present posterolaterally, remainder shiny. Scattered elongate, flexuous setae present on both waist segments. Gaster smooth and shiny, lacking obvious sculpture; with scattered elongate, flexuous setae that are directed posteriorly present; sting not present, atrophied.

Major Worker (Figure 57): Small, larger than minor worker (HL 0.86–0.91 mm, HW 0.80–0.84 mm, SL 0.44–0.46 mm, EL 0.11–0.13 mm, MeSL 0.52–0.55 mm, SPL 0.05–0.06 mm, PetW 0.08–0.09 mm, PPW 0.11–0.13 mm, PronW 0.28–0.31 mm) (n=5, MEM specimens). Head, mesosoma, waist, and antennae dark reddish-brown; gaster darker brown to somewhat infuscated at base to darker brownish-black posteriorly; legs lighter, orangish-brown. Head greatly enlarged, larger than mesosoma, almost as wide as long; posterior margin of head deeply concave, corners of head strongly rounded; posterior corners of head shiny, lacking sculpture, remainder of head with strong longitudinal rugae and some rugoreticulation between eye and frontal carina, spaces between mostly shiny; clypeus and mandibles mostly lacking sculpture; frontal triangle prominent, shiny; entire head with scattered, but regular short, erect setae, mostly directly anteriorly and away from head on and near margins, but setae located on central portion of head directed toward midline; eyes small, located below midline of head; ocelli lacking; antennae 12-segmented, with three-segmented club; scapes short, about half of head length; mandible triangular, enlarged, edentate except for apical tooth; ventrally, five hypostomal teeth present, mid tooth wide and short, inner and outer teeth stout triangular. Mesosoma sides and dorsum of foveolate, transverse carina present on dorsum of pronotum, a few weak carina present on mesopleura and sides of propodeum; scattered erect setae present on promesonotal dorsum; with distinct promesonotal groove present; strong metanotal groove present; propodeum set distinctly below level of promesonotum; propodeal declivity concave, propodeal spines strong, somewhat finger-like, directed upward and slightly posteriorly; propodeal spiracle circular. Waist two-segmented, with scattered elongate, flexuous setae present on both waist segments: petiole about twice as long as wide (dorsal view), pedunculate, node raised, and conical in lateral view, somewhat rectangular in dorsal view; sides of petiole foveolate, dorsum shiny; postpetiole wider than long in dorsal view, node elliptical, some foveolate sculpture present posterolaterally,

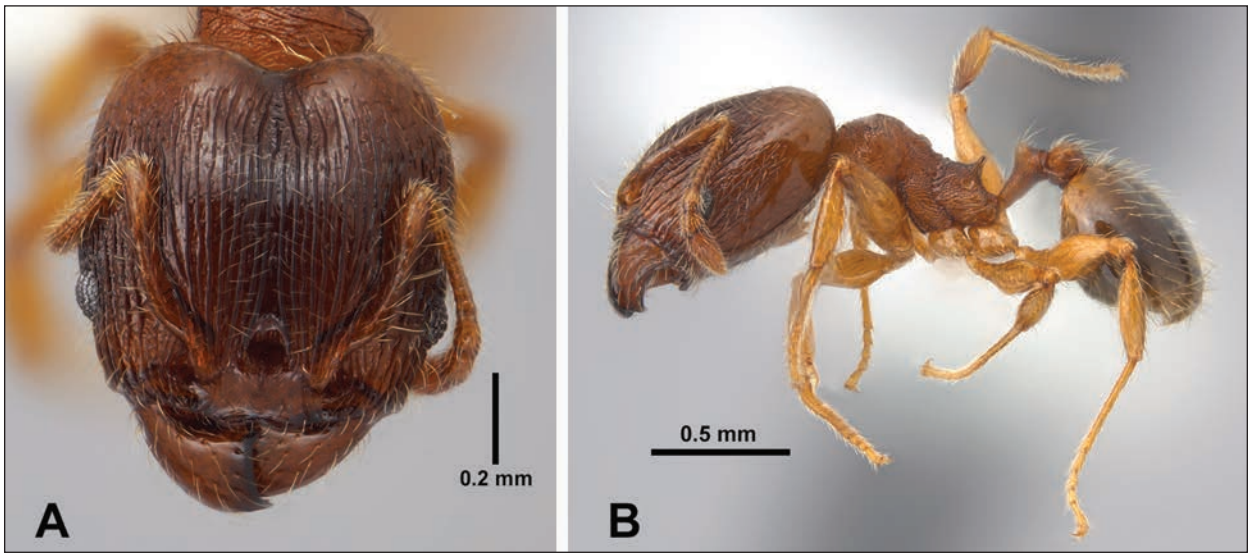


Figure 57. *Pheidole navigans* major worker (A) full face view and (B) lateral view.

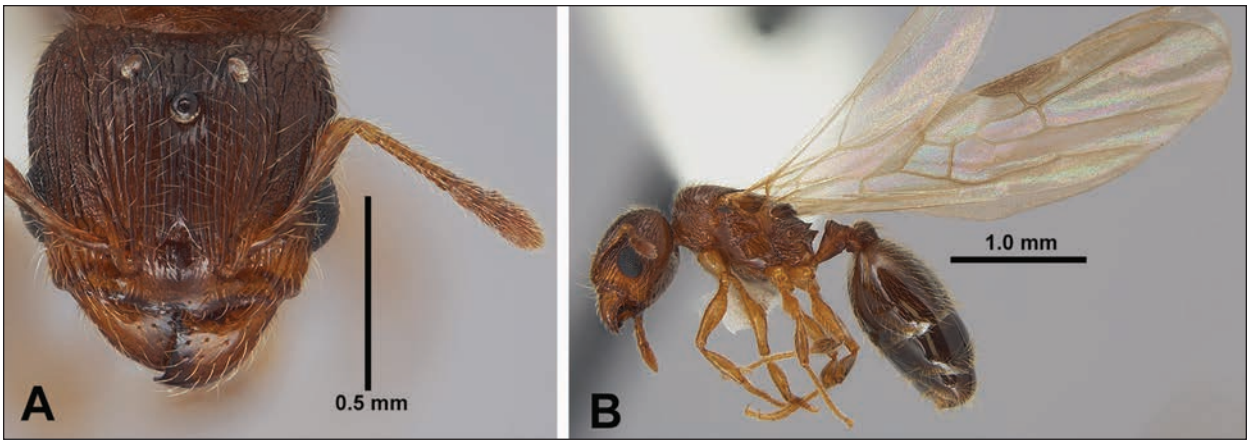


Figure 58. ***Pheidole navigans*** **alate queen (A) full face view and (B) lateral view.**

remainder shiny. Gaster smooth and shiny, lacking obvious sculpture; with scattered elongate, flexuous setae that are directed posteriorly present; sting absent.

Queen (First description of caste) (Figure 58): Small, larger than major worker (HL 0.74–0.83 mm, HW 0.81–0.90 mm, SL 0.45–0.49 mm, EL 0.24–0.27 mm, MeSL 1.16–1.22 mm, SPL 0.08–0.11 mm, PetW 0.23–0.25 mm, PPW 0.37–0.40 mm, PronW 0.71–0.75 mm, FWL 3.80–4.20 mm) (n=5, MEM specimens). Head (including mandibles and antennae), mesosoma, and waist dark reddish-brown; gaster dark brownish-black; legs orangish-brown; and wings hyaline with dark stigma. Head slightly wider than long, widest posteriorly before gradually diverging anteriorly, posterior margin broadly concave; entire head in full face and lateral view with strong longitudinal rugae present, with transverse rugae on posterior region of head and between eye and frontal carina forming a rugoreticulate pattern, spaces between rugae shiny in mid region of head (full face view) and foveolate laterally from approximately the edge of the frontal carina to margins of the head; entire head with numerous scattered erect setae with setae on sides of head directed posteriorly away from the head and setae on central region of head directed toward midline of head; scapes with numerous erect setae; eyes large, length of eye less than the distance between eye and posterior edge of head; ocelli conspicuous; frontal triangle obvious, with rugae from head extending through it; antennae 12-segmented, with three-segmented club; scapes short, length about 2/3 the head length; mandible large, triangular, and edentate except apical tooth. Mesosoma rounded rectangular, dorsally flattened; overall shiny, mostly lacking sculpture dorsally, pronotum and propodeum with rugulate sculpture, mesopleura mostly lacking sculpture, smooth; entire mesosoma with numerous short, semierect curved setae that are directed posteriorly. Wings translucent with light brown tint and light brown venation; forewing venation of typical myrmicine type with pterostigma and costal, basal, subbasal, discal, marginal, and two submarginal cells closed; hindwing lacking jugal lobe and with costal, basal, and subbasal cells. Waist two-segmented, with scattered elongate, flexuous setae present on both segments: petiole about twice as long as wide (dorsal view), pedunculate, in lateral view node raised and conical, somewhat rectangular in dorsal view, sides of petiole foveolate, dorsum shiny; postpetiole wider than long in dorsal view, almost twice as long as petiole, node elliptical (dorsal view), some foveolate sculpture present posterolaterally, remainder shiny. Gaster smooth and shiny, lacking obvious sculpture; with scattered elongate, flexuous setae that are directed posteriorly present; lacking sting.

Male (First description of caste) (Figure 59): Small (HL 0.47–0.50 mm, HW 0.59–0.60 mm, SL 0.12 mm, EL 0.29–0.32 mm, MeSL 1.12–1.16 mm, PetW 0.15–0.16 mm, PPW 0.20–0.23 mm, PronW 0.65–0.68 mm, FWL 2.80–3.04 mm). (n=3, MEM specimens). Head dark brown; mesosoma, waist and gaster light brown; antennae and legs pale yellow-brown; and wings hyaline. Head longer than wide, full face view head widest posteriorly measuring from outer edge of eye to eye, somewhat hexagonal in shape (excluding eyes); clypeal area with some longitudinal carinae, remainder of head with strong, tightly woven rugoreticulation; numerous erect setae of varying lengths present on head; eyes huge, more than half the length of head, placed on lower half of head; ocelli large and protruding; antennae 13-segmented, beaded, scapes short and rectangular, pedicel globular, scapes with short, semierect setae,

funiculus densely pubescent; mandibles reduced, edentate. Mesosoma rounded rectangular; shiny with limited sculpture; with numerous, short, erect setae; pronotum somewhat trapezoidal; mesoscutum broadly rounded anteriorly and overhanging pronotum; mesoscutellum with a declivious face that is distinctly elevated above propodeum; propodeal declivity irregular. Wings pale translucent hyaline with veins light brown; forewing venation of typical myrmicine type with pterostigma and costal, basal, subbasal, discal, and two submarginal cells closed; hindwing lacking jugal lobe and with costal, basal, and subbasal cells closed. Waist two-segmented, with limited sculpture, numerous erect setae present: petiole pedunculate, elongate, node barely raised; postpetiole short, rounded, somewhat circular. Gaster shiny, with numerous erect setae present.

Biology

Pheidole navigans is a common species in the Gulf Coast region from western Texas to eastern Georgia. MEM researchers routinely find this species nesting in natural wooded habitats in rotting wood, especially logs found on the ground, or in the soil just under rotting wood, but also in suburban landscapes under boards, under bark of dead and live trees, at bases of oak trees and fence posts, along roots, under palm leaves, and inside wall crevices. The MEM has found this species in the following habitats and microhabitats: live oak and palmetto litter, slash pine litter, magnolia litter, leaf litter in hind dunes, chenier woodland, coastal savanna, mixed pine/hardwood forest near estuary, longleaf pine forest, pine oak forest near coastal dunes, longleaf pine/palmetto scrub, relic dune scrub, oak-pine sandhill, foredunes, sandy xeric scrub, longleaf pine/hardwood forest, a mixed oak/pine forest, hardwood forest, oak-hickory forest, riparian hardwood forest, open grassy area by highway, long roadside, under mulch at plant nursery, in house (swarming), along railroad tracks, and on palm trees at nursery. In general, the diet of *P. navigans* appears to be seeds, small arthropods, and scavenged human food (in urban areas). This species is attracted to hotdog bait, cookie bait, brown sugar/yeast bait, peanut butter, and other baits. Colony sizes range from small (a few hundred workers) to relatively large with thousands of workers with about five times as many minor workers as major workers. The individual chambers within a colony are small and usually are built with small soil or debris particles and have small openings. Colonies are monogynous, although several queens may start founding a nest (Naves 1985). As with many other introduced species, *P. navigans* reproductives have a broad flight period, and the MEM has flight records from early May to late October. *Pheidole navigans* has been observed nesting side by side with the large introduced ponerine ant, *Odontomachus haematodus*. Unlike many of our native species of *Pheidole*, it is not unusual to see major workers of *P. navigans* foraging with minor workers.

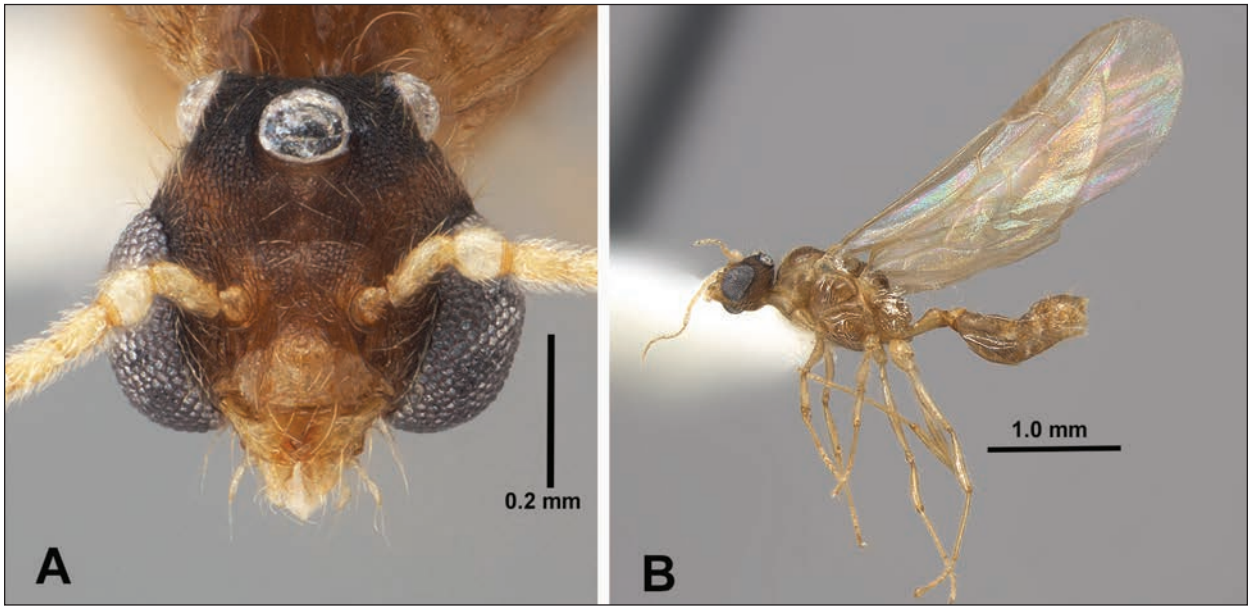


Figure 59. *Pheidole navigans* male (A) full face view and (B) lateral view.

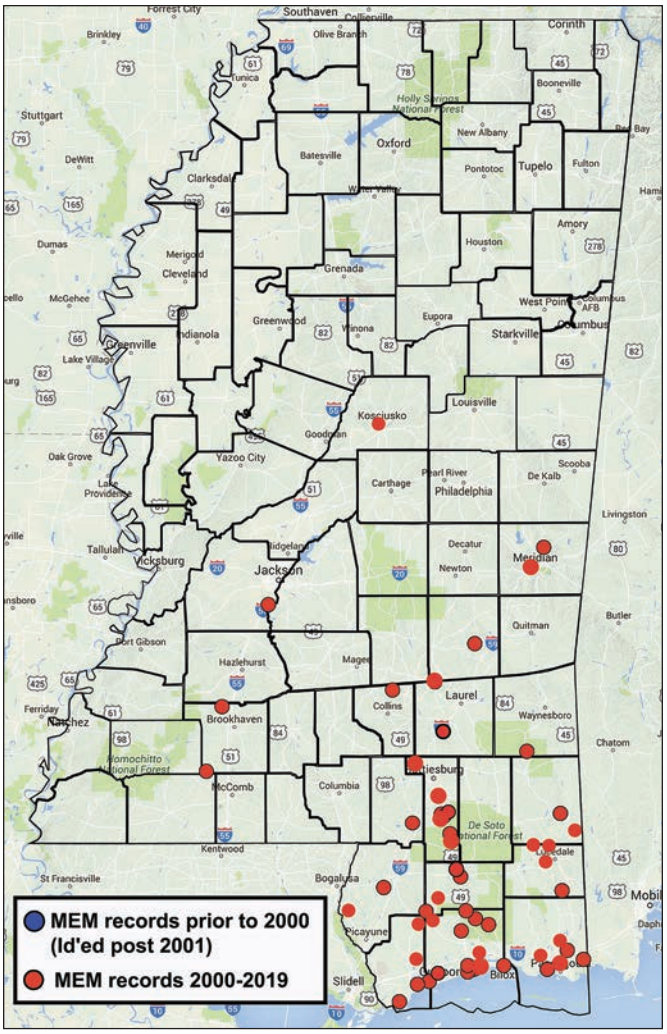
Pest Status

According to Deyrup et al. (2000), this species rarely enters homes. However, workers are readily attracted to both sugary and protein baits and could pose a nuisance threat in areas with high populations. Additionally, the MEM has received numerous complaints of large numbers of winged reproductives swarming in homes, causing a nuisance. Some homeowners were concerned that the dark-colored females were swarming termites. As with other members of the genus, the sting is atrophied; therefore, this species does not pose a stinging threat to humans.

It seems likely that dense populations of this species have some effect on native insects that serve as prey, but the diet of *P. navigans* has not been investigated in detail. Deyrup et al. (2000) reported that this species occurs throughout Florida in a wide variety of habitats and that it may have already partially replaced *P. dentigula* Smith and *P. bilimeki* Mayr (=*floridana* auct.). Because colonies are often in rotten wood, in leaf litter, and in hollow twigs and nuts on the ground, or occasionally arboreal, *P. navigans* may compete for nest sites with native species in the genera A*phaenogaster, Camponotus, Nylanderia, Solenopsis, Hypoponera, Strumigenys, Brachymyrmex,* and other species

Distribution

According to Sarnat et al. (2015), *P. navigans* is probably native to South America. Most U.S. records refer to *P. moerens*. However, after examination by Sarnat (Sarnat et al. 2015) and MacGown (MEM), specimens representing these records from the U.S. appear to be *P. navigans* and are known from Alabama, California, Florida, Georgia, Hawaii, Louisiana, Mississippi, North Carolina, South Carolina, Texas, and Washington. MEM records from Mississippi include Attala, Covington, Forest, George, Greene, Hancock, Harrison, Hinds, Jackson, Lamar, Lauderdale, Lincoln, Monroe, Newton, Pearl River, Perry, Pike, Stone, and Wayne Counties (Map 18).



Map 18. *Pheidole navigans* in Mississippi site records in Mississippi based on MEM specimens.

Pheidole obscurithorax Naves, 1985 — "dark-bodied big-headed ant"

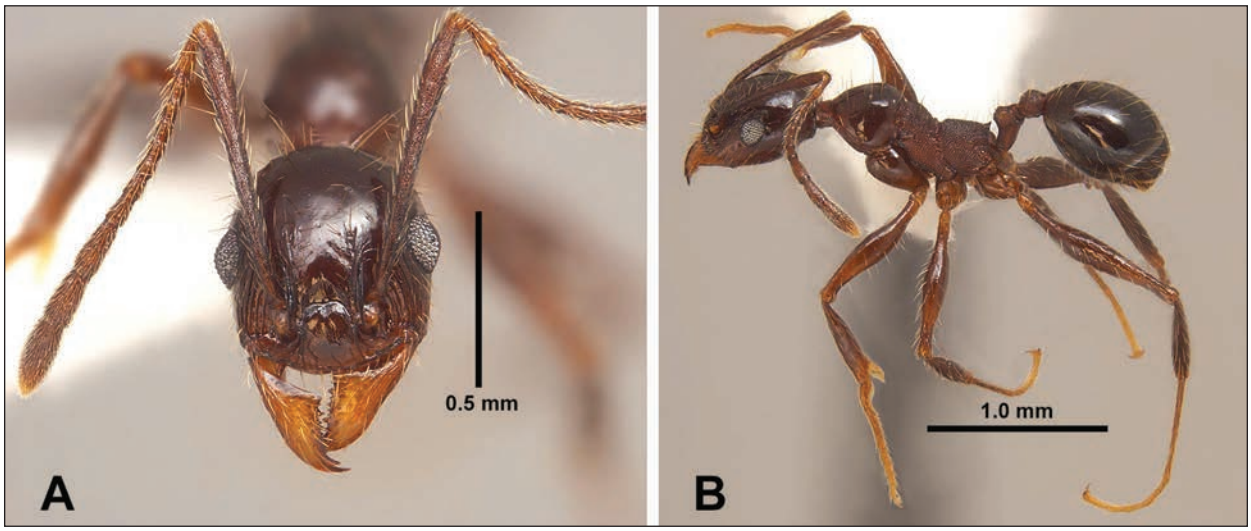


Figure 60. *Pheidole obscurithorax* minor worker (A) full face view and (B) lateral view.

Summary

Pheidole obscurithorax (Naves) (Formicinae) is a large, dark-colored species native to South America that is now common along the U.S. Gulf Coast from northern Florida to eastern Texas. Based on the steady expansion of its range in the U.S. and its ability to successfully establish colonies in the same habitat with the red imported fire ant (*Solenopsis invicta* Buren) and other ant species, this species shows invasive potential in the U.S.

Diagnosis

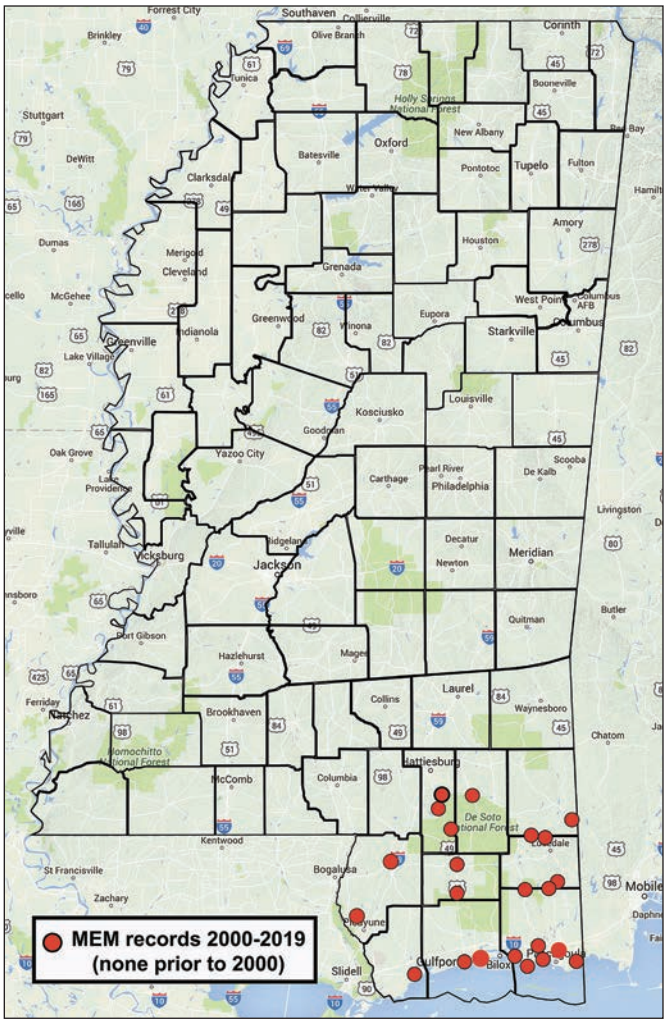
In North America, it is relatively easy to distinguish major workers of *P. obscurithorax* from any other native or exotic species of *Pheidole*. The large size (TL ≈ 5.0–6.0 mm), heavily sculptured head, and thick scape, which is curved mesally and angular laterally, are unique among the *Pheidole* of North America. This is the only *Pheidole* species in the Southeast of this size. However, in the U.S., minor workers could easily be confused with those of *Pheidole dentata* Mayr, 1886, both of which may be found in the same habitats. Minor workers of *P. obscurithorax* differ from *P. dentata* by being larger (TL ≈ 2.5-3.0 mm), having a more ovate head, and by having the nuchal collar visible in full face view. Queens of *P. obscurithorax* are similar to major workers, but are larger, have ocelli, and have an enlarged mesosoma for flight muscles.

Descriptions

Minor Worker (Figure 60): Small to medium-sized (HL 0.67–0.73 mm, HW 0.53–0.62 mm, SL 0.82–0.93 mm, EL 0.16–0.18 mm, MeSL [mesosomal length] 0.95–1.06 mm, PronW 0.40–0.47 mm, PSL 0.03–0.04 mm, PetW 0.11–0.14 mm, PPW 0.16–0.19 mm) (n=5, MEM specimens). Concolorous dark reddish-brown with mandibles and tarsi a lighter yellowish-brown; entire body with numerous flexuous, elongate setae present. Head longer than wide, ovate; nuchal collar visible; strongly shining, mostly lacking sculpture except for striae present between eyes and frontal lobes, striae not extending posteriorly beyond eyes; eyes large, located on sides of head at approximately the midpoint of head; antenna 12-segmented, apical three antennomeres forming a loose club, scape straight, longer than head length; clypeus evenly rounded anteriorly; mandibles elongate triangular with nine small teeth followed by two large apical teeth. Mesosoma with "stepped" appearance in profile, promesonotal and metanotal sutures deep, pronotum raised above mesonotum, and mesonotum raised above propodeum; pronotum strongly rounded, lacking sculpture, shiny; remainder of mesosoma and waist strongly foveolate; propodeal dorsum longer than declivity, short spines present. Waist two-segmented, with rough punctate sculpture; petiolar peduncle thickened, node conical in lateral view, subquadrate dorsally; postpetiole circular in lateral view, rounded square in dorsal view, about the same width as petiole. Gaster lacking sculpture, shiny; sting absent.

Major Worker (Figure 61): Large, more than twice the size of minor workers (HL 1.62–1.84 mm, HW 1.56–1.72 mm, SL 0.92–1.00 mm, EL 0.20–0.25 mm, IHT 0.38–0.44 mm, OHT 0.57–0.65 mm, MeSL 1.47–1.62 mm, PronW 0.86–0.96 mm, PSL 0.08–0.12 mm, PetW 0.24–0.32 mm, PPW 0.34–0.47 mm). (n=6, MEM specimens). Head medium to dark reddish-brown, mandibles and antennal scapes dark

reddish-brown to black; mesosoma, waist, and legs medium reddish-brown to dark reddish-brown; gaster dark reddish-brown to black; entire body with numerous flexuous, elongate setae present, setae on head shorter and stiffer. Head about as long as wide to slightly longer than wide; posterior corners strongly rounded; posterior margin deeply cleft; front and sides of head with strong rugoreticulation; anterior margin of clypeus with deep notch in middle; eyes small with numerous tiny facets; located on sides of head (in full face view) approximately 1/3 of head length from anterior edge of clypeus; antenna 12-segmented, apical three antennomeres forming a loose club; scape short, strongly angled basally and thickened mesally; mandibles large, mostly edentate, but with short, stout basal tooth, and two large apical teeth; hypostomal border with short, blunt tooth in middle, two short, triangular inner teeth (reduced in some specimens), and two widely spaced thickly triangular outer teeth. Mesosoma with "stepped" appearance in profile, promesonotal and metanotal sutures deep, pronotum raised above mesonotum, and mesonotum raised above propodeum; pronotum roughly rounded with transverse striae dorsally and semi-circular concentric striae laterally; mesopleura and sides of propodeum mostly foveolate, but with some transverse striae, especially basally; mesonotal, metanotal, and propodeal dorsa with transverse striae, shiny; propodeal dorsum longer than declivity, short spines present. Waist two-segmented, with rough punctate sculpture; petiolar peduncle thickened, node conical in lateral view; postpetiole subquadrate in lateral view, ovate in dorsal view, wider that petiole. Gaster with strong shagreening on anterior half of first tergite; remainder of gaster mostly shining; sting absent.



Map 19. *Pheidole obscurithorax* site records in Mississippi based on MEM specimens.

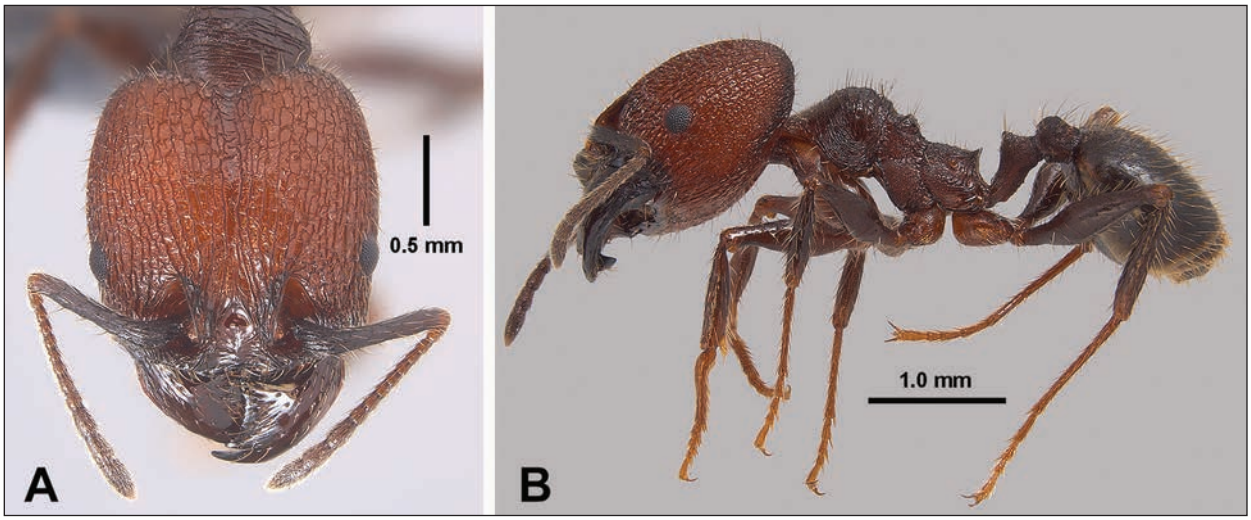


Figure 61. *Pheidole obscurithorax* major worker (A) full face view and (B) lateral view.

Queen (Figure 62): Large, larger than major worker (HL 1.36–1.42 mm, HW 1.58–1.64 mm, SL 0.98–1.00 mm, EL 0.32–0.40 mm, MeOL [median ocellar length] 0.15–0.16 mm, IHT 0.46–0.49 mm, OHT 0.63–0.65 mm, MeSL 2.53–2.55 mm, PronW 1.30–1.60 mm, PSL 0.12–0.15 mm PetW 0.53–0.55 mm, PPW 0.75–0.80 mm, FWL 7.40–7.80 mm) (n=5, MEM specimens). Concolorous dark reddish-brown; entire body with numerous semierect to erect setae present, with setae on head and dorsum of mesosoma shorter and stiff, those on gaster longer and more flexuous. Head quadrate, slightly wider than long; posterior border straight to weakly convex; front and sides of head with deep rugoreticulation present; anterior margin of clypeus with deep notch in middle; eyes large, placed at approximately the midpoint of head on sides of head in full face view; three ocelli present, arranged in roughly an equilateral triangle; Antenna 12-segmented, apical three antennomeres forming a loose club; scape short, strongly angled basally and thickened mesally; mandibles large, mostly edentate, but with large basal tooth, four minute denticles, and two large apical teeth; hypostomal border with short, blunt tooth in middle, two short, triangular inner teeth, and two widely spaced thickly triangular outer teeth. Mesosoma enlarged for wings, dorsally flattened; dorsum of pronotum, mesonotum, and metanotum with longitudinal striae; sides of pronotum, mesopleura, sides and dorsum of propodeum, and sides and dorsum of petiolar and postpetiolar nodes with transverse striae with punctation between striae dulling the surface; propodeal spines short, denticle-like. Wings, when present, with light yellow-brown tint; pterostigma brown; forewing with closed costal, basal, subbasal, discal, and two submarginal cells; hindwing with costal, basal, and subbasal cells. Waist two-segmented, with rough punctate sculpture; petiolar peduncle thickened, node conical; postpetiole subquadrate in lateral view, oblong-ovate in dorsal view. First gastral tergite with fine striae anterior, becoming shagreened and finally shiny posteriorly.

Male: Specimens not available for study.

Biology

In the U.S., *Pheidole obscurithorax* typically nests in open, disturbed habitats, where populations may be abundant. Nests are medium to large in size and marked by an obvious crater. In its native range in South America and invasive range in North America, *P. obscurithorax* is a major competitor of the invasive red imported fire ant *Solenopsis invicta* (Calcaterra et al. 2008). MacGown (unpublished data) has observed *P. obscurithorax* quickly find baits and then outcompete *S. invicta* at those baits. Although *P. obscurithorax* is an omnivorous species, it is an aggressive predator as well. MacGown has observed minor and major workers cooperating together to attack and carry much larger prey such as lepidopteran larvae into colonies.

Pest Status

This species has been observed to defend their prey from *S. invicta* (Storz 2003, Storz and Tschinkel 2004, MEM observations), although not always successfully. It is unclear what effect this species may have on native arthropods or ground-nesting vertebrates. Hill (2006) reported this species attacking a hatchling chicken, which illustrates its potential to impact ground-nesting birds. As with other *Pheidole* species, the sting is atrophied, thus this species cannot sting.

Distribution

Pheidole obscurithorax is thought to be native to Argentina. In the U.S., its distribution is mostly Gulf Coastal with records from Alabama, Florida, Georgia, Louisiana, Mississippi, and Texas. MEM county records from Mississippi of this species include Forrest, George, Greene, Hancock, Harrison, Jackson, Perry, and Stone (Map 19).

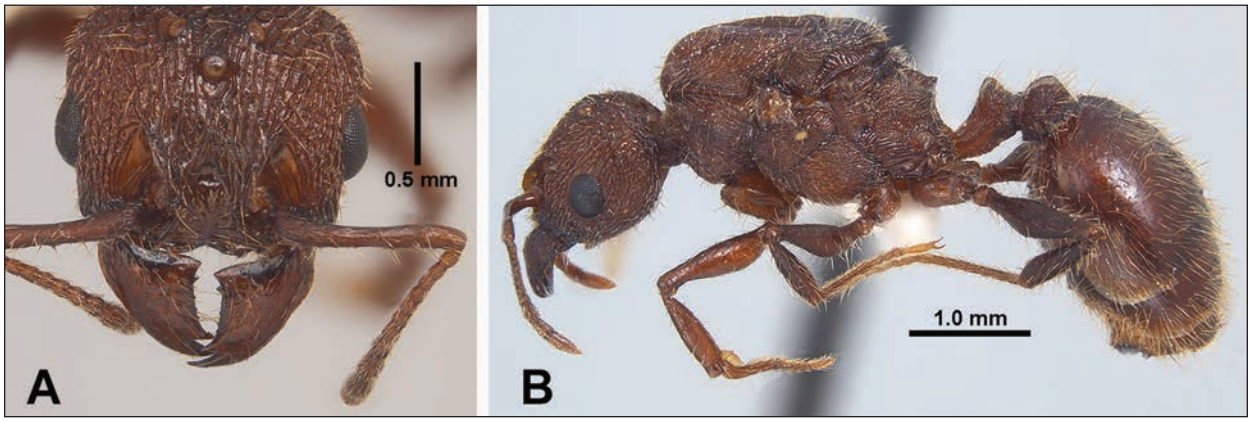


Figure 62. *Pheidole obscurithorax* dealate queen (A) full face view and (B) lateral view.

Pseudomyrmex gracilis (Fabricius, 1804) — "graceful twig ant"

Figure 63. ***Pseudomyrmex gracilis*** **worker (A) full face view and (B) lateral view.**

Summary

Pseudomyrmex gracilis (Fabricius) (Pseudomyrmicinae) is a large (TL ≈ 8.0–10 mm) orange and black species thought to be native to Mexico and South America (Wetterer 2010c). This species is known from Argentina and Brazil through Texas, parts of Southeast, and the Caribbean (Wetterer 2010c). Due to its recent spread in the Southeast and its painful sting, this species can now be considered invasive.

Diagnosis

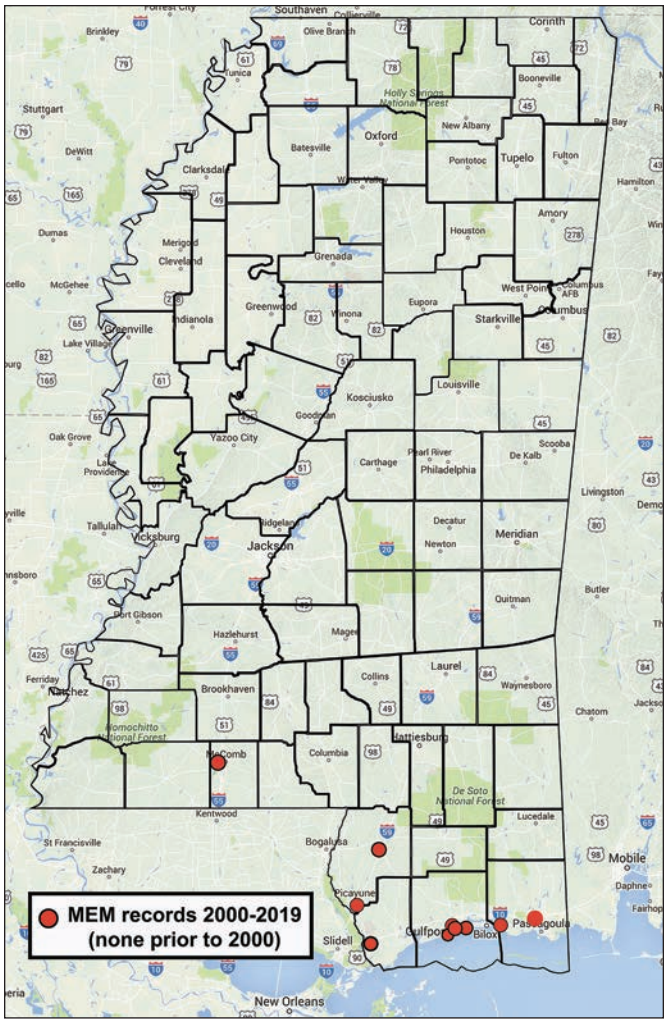
Pseudomyrmex workers can easily be distinguished from other U.S. genera by the following characteristics: slender elongate body; extremely large eyes, more than 1.5 times as long as wide; ocelli present; 12-segmented antennae with short scapes; front carinae close together and antennal insertion points almost touching; relatively short mandibles with seven to 10 teeth; and sting present. *Pseudomyrmex gracilis* is easily separated from all other U.S. species of *Pseudomyrmex* by its large size, orange and brown coloration, and abundant erect setae.

Descriptions

Worker (Figure 63): Large (HL 1.5–1.74 mm, HW 1.54–1.72 mm, SL 0.73–0.84 mm, EL 0.89–1.05 mm, MeSL 2.08–2.42 mm) (n=5, MEM specimens). Color is variable, especially geographically, ranging from mostly black to concolorous orange to bicolored orange and black. Specimens from the Southeast are usually bicolored with the antennae, clypeus, pronotum, posterior portion of propodeum, parts of the postpetiole, and legs orangish, and the remainder of the head (including eyes), midportion of mesosoma, part of postpetiole, and gaster dark brownish-black. Head about as long as wide, rounded square, widest at edges of eyes; integument matte, with dense, appressed pubescence and numerous erect setae; eyes extremely large (more than 1/2 the length of the head); located laterally; three small ocelli present; antennal insertion points set closely together; antennae 12-segmented, not clubbed, scape curved outward; clypeus short and wide; mandibles triangular, with two apical teeth followed by minute dentition with a total of seven to 10 teeth total. Mesosoma elongate, narrowed; with dense, silvery-white pubescence and numerous erect setae dorsally; pronotum somewhat shiny, remainder of mesosoma matte; metanotal groove distinct; propodeal spines lacking. Waist two-segmented, elongate, matte to slightly shiny, with numerous appressed setae and abundant larger, erect setae; petiole pedunculate, node somewhat flattened, ovate dorsally; postpetiole ovate laterally, rounded triangular dorsally. Gaster with dense, appressed pubescence and a mixture of erect setae that becomes more prevalent near the apex; well-developed sting present.

Queen (First description of caste) (Figure 64): Large, larger than worker (HL 1.77–1.92 mm, HW 1.58–1.74 mm, SL 0.75–0.82 mm, EL 1.05–1.10 mm, MeSL 2.52–3.04 mm) (n=5, MEM specimens). Concolorous black to bicolored orange and black, with head (except clypeus), mesosoma (except pronotum and posterior portion of propodeum), mid and hind coxae, parts of the postpetiole, and gaster black with the remainder of the body

orangish-brown (mid and hind legs often with infuscation). Head rounded rectangular, slightly longer than wide compared to the worker; integument matte with fine punctation; covered with dense, silvery setae and some darker, erect setae; eyes elongate, large, located laterally along the midline of the head; three small ocelli present; a slight medial depression running from the antennal insertion point to the middle ocelli often present; frontal carinae and antennal insertion points set closely together; antennae 12-segmented, lacking club, scape slightly curved outward; clypeus somewhat reduced, anterior margin rounded; mandibles curved triangular, with two apical teeth followed by minute dentition. Mesosoma elongate, thicker than worker; pronotum shiny, remainder of mesosoma slight matte; with numerous appressed and erect setae; pronotal band visible dorsally; mesonotum flat dorsally; propodeal declivity broadly rounded, propodeal spines lacking. Wings mostly transparent, venation brown; forewing with dark-brown pterostigma and closed costal, basal, subbasal, discal, two submarginal, and marginal cells; hindwing with closed costal, basal, and subbasal cells. Waist elongate, two-segmented; both nodes with elongate, erect setae and numerous fine, appressed setae; petiole pedunculate, node somewhat spherical in lateral view, ovate dorsally, with a tubercle-like spiracle present anterolaterally; postpetiole ovate laterally, rounded triangular dorsally, widest posteriorly, much wider than petiole. Gaster matte, with numerous appressed, whitish setae and longer, dark erect setae (especially apically); well-developed sting present.



Map 20. *Pseudomyrmex gracilis* site records in Mississippi based on MEM specimens.

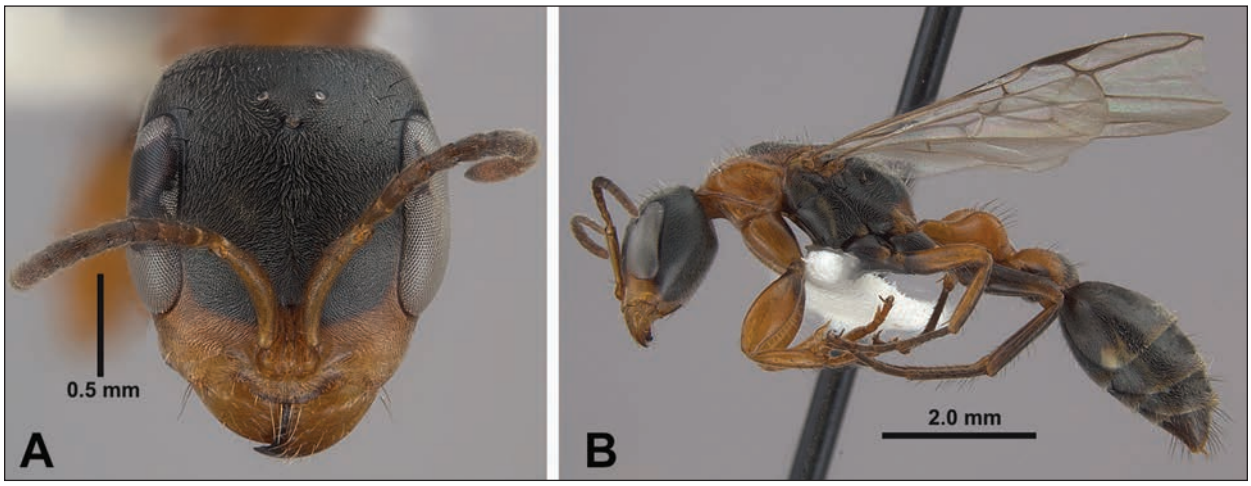


Figure 64. *Pseudomyrmex gracilis* alate queen (A) full face view and (B) lateral view.

Male (First description of caste) (Figure 65): Large (HL 1.32–1.38 mm, HW 1.42–1.60 mm, SL 0.23–0.25 mm, EL 0.80-0.90 mm, MeSL 2.56-2.72 mm) (n=5, MEM specimens). Bicolored brown and orangish to brown and pale-yellow with the dorsum of the mesosoma, gaster, apex of head, and antennae brown; anterior half of head, underside of mesosoma, and much of the legs orangish-brown. Head almost circular in shape with a mixture of erect and fine, appressed setae; eyes well developed and situated laterally at the midpoint of the head; three distinct ocelli present; mandibles with one apical tooth followed by minute dentition; 12-segmented antennae with a short scape; minute tubercle located between the antennal insertion points; mandibles elongate triangular, with small teeth. Mesosoma densely covered with slivery-white, erect, and appressed setae; four wings present. Waist elongate, thin and two-segmented; nodes very low, almost continuous with the gaster. Gaster narrow and elongate with appressed and erect setae. Males of the graceful twig ant is easily recognized by its elongate, wasp-like appearance, large size (TL 8–10 mm, HW 1.39-2.07), orange and black to entirely blackish or entirely orangish-brown coloration, large eyes (REL 0.54–0.60) ocelli, elongate two-segmented waist, and a well-developed sting. Mandible with seven to 10 teeth. Body with numerous fine, silvery-white setae.

Biology

Pseudomyrmex gracilis is an arboreal species that nests in hollow twigs, branches, stems, and grasses in natural habitats, as well as in crevices in buildings in urban areas (Wetterer 2010c). *Pseudomyrmex gracilis* has also been reported to opportunistically nest in the thorns of ant-acacias but without providing defense for the trees (Wetterer and Wetterer 2003, Wetterer 2010c). *Pseudomyrmex gracilis* may be found in a wide variety of habitats such as mangrove forests, thorn scrub, and rainforests (Ward 1993). However, it may also be common in disturbed habitats such as old fields, roadsides, and secondary forests (MEM data). Colony size is typically small with one queen per colony.

Pest Status

Pseudomyrmex gracilis workers and queens may inflict painful stings when disturbed. Stings usually occur after a worker falls from foliage onto human skin but also when workers are defending their colony. According to Wheeler and Wheeler (1956), *P. gracilis* readily defends its colony by swarming and stinging intruders. Klotz et al. (1995) reported finding nests of this species in wooden door frames of houses. Because this ant has a high likelihood of coming in contact with humans and has a painful sting, this species is worth monitoring.

Distribution

Pseudomyrmex gracilis has been reported from parts of South America, Central America, and Mexico, as well as in the U.S. from Texas east to Florida and north to South Carolina in the Coastal Plain. In the U.S., this species is known to occur in Alabama, California, Florida, Georgia, Hawaii, Louisiana, Mississippi, South Carolina, and Texas (MEM records, Wetterer 2010b, Doug Booher, Pers. Comm., antweb.org). In Mississippi, this species has only been collected in the southern portion of the state: Hancock, Harrison, Jackson, Pearl River, and Pike Counties (MEM records) (Map 20).

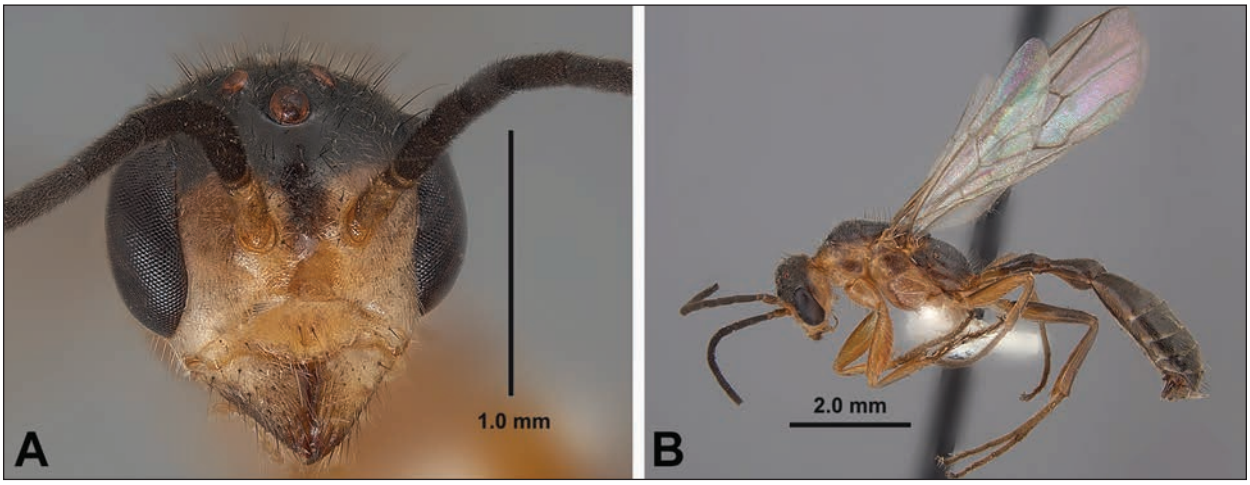


Figure 65. *Pseudomyrmex gracilis* male (A) full face view and (B) lateral view.

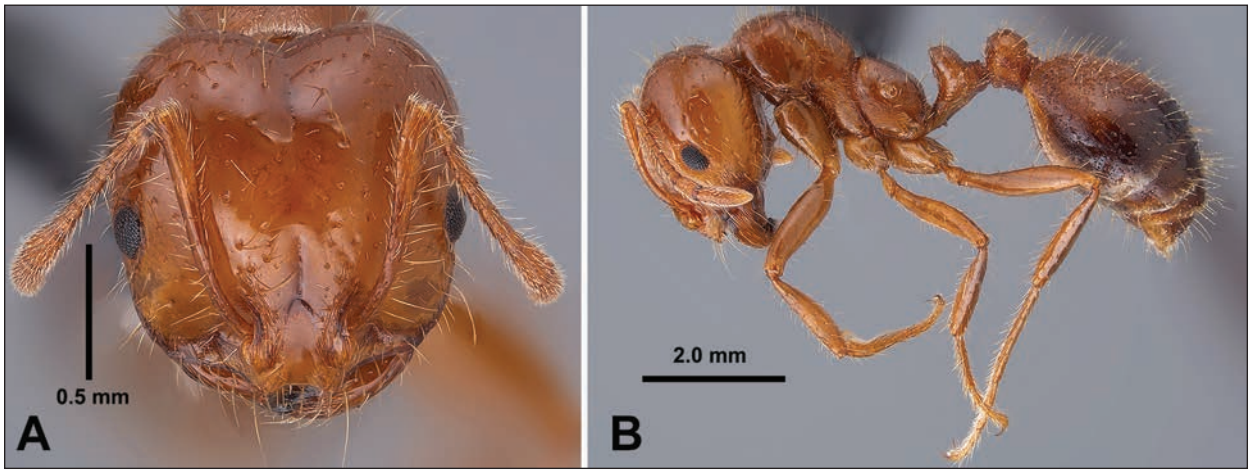


Figure 66. ***Solenopsis invicta*** **worker (A) full face view and (B) lateral view.**

Summary

Solenopsis invicta (Buren) (Myrmicinae), commonly referred to as red imported fire ant (RIFA), is a small, bicolored red and blackish species native to Brazil. This species is well established in the Southeast and the Caribbean and has spread to California, Australia, New Zealand, and Southeast Asia, with potential of expanding into other countries (Morrison et al. 2004). *Solenopsis invicta* is responsible for countless serious stinging incidents each year.

Diagnosis

Workers of *S. invicta* are polymorphic, ranging in size from about 1.0–4.0 mm in overall length. They are bicolored with a reddish-brown head and mesosoma and brownish-black gaster, have a 10-segmented antenna that terminates in a two-segmented club, lack propodeal spines, have a two-segmented waist, and have a prominent sting. The aforementioned characteristics will serve to easily separate this genus from other genera in our region; however, species level identification is difficult. In Mississippi, *S. invicta* is most similar to *S. richteri* Forel, the black imported fire ant, which is generally darker in overall color, has black antennal scapes, and has a strongly pronounced humeral area on the pronotum. These two closely related species produce hybrids, *Solenopsis invicta* X *richteri,* which have characteristics of both. The most reliable method for identification of this group is a cuticular hydrocarbon test, which some labs are now equipped to do.

Descriptions

Worker (Figure 66): Polymorphic, small to medium-sized (HL 0.68–1.43 mm, HW 0.57–1.37 mm, SL 0.59–1.05 mm, EL 0.13–0.26 mm, MeSL 0.79–1.56 mm) (n=10, MEM specimens). Head, mesosoma, waist, antennae, and legs reddish-brown; gaster brownish-black, anterior portion of first tergite often reddish-brown fading to darker coloration. Head longer than wide, rounded rectangular in small workers to almost square in large workers; shining, lacking sculpture except for scattered piligerous punctures from which arise light-colored erect setae; posterior border of head flat to slightly convex in smaller workers to having strong posterior lobes and strong medial indention in larger workers; eyes small, located laterally at about the midpoint of the head; antennae 10-segmented with a two-segmented club; clypeus tridentate with two lateral toothlike projections and one smaller toothlike projection medially; mandibles triangular with five prominent teeth. Mesosoma mostly smooth and shining, lacking sculpture except for transverse striae on katepisternum and lower portion of propodeum; numerous light-colored, erect setae of varying lengths present; promesonotum fused, arched and convex in lateral view; pronotum lacking well-defined humeral processes; metanotal groove distinct; propodeum unarmed. Waist two-segmented with erect setae; petiolar node narrower than the postpetiolar node in lateral view. Gaster smooth and shining with erect setae; sting present.

Queen (Figure 67): Large (HL 1.25–1.38 mm, HW 1.29–1.38 mm, SL 0.95–1.04 mm, EL 0.45–0.48 mm, MeSL 2.54–2.76 mm) (n=5, MEM specimens). Head,

mesosoma, waist, antennae, and legs reddish-brown; gaster brownish-black, often the anterior portion of first tergite with some light reddish-brown coloration. Head about as wide as long, rounded square; smooth and shining with scattered erect setae; eyes large and situated laterally at the midpoint of the head; three ocelli present; antennae 11-segmented with a two-segmented club; clypeus tridentate, median tooth minute, with two anteriorly diverging carinae; mandibles with four teeth. Mesosoma rounded rectangular, almost square, with mesoscutum rounded anteriorly; mostly smooth and shining except some striae present on anterior portion of mesoscutellum and propodeum with numerous transverse striae; numerous erect setae present dorsally and on propodeum, but sparse on pronotum and mesopleura; dorsal surface relatively flat; four wings or wing scars present; propodeum unarmed; declivity straight, almost 90∞. Wings clear with light amber colored veins; forewing with costal, basal, subbasal, submarginal, and discal cells present, pterostigma present; hindwing with costal, basal, and anal cells present. Waist two-segmented with erect setae; petiolar node narrower than the postpetiolar node in lateral view. Gaster shining with long erect setae; sting present.

Male (Figure 68): Medium sized, larger than workers (HL 0.83–0.85 mm, HW 0.86–0.88 mm, SL 0.17–0.18 mm, EL 0.48–0.49 mm, MeSL 2.60–2.72 mm) (n=2, MEM specimens). Head, mesosoma, waist and gaster blackish; scape and pedicel brown, remainder of funiculus yellow-brown; legs dark brown. Head small compared to the mesosoma, circular; shiny with coarse rugae anteriorly fading to dense punctation posteriorly, clypeus mostly lacking sculpture; with numerous long, erect, whitish setae present; eyes large, more than twice the head length, located on the anterior half of the head; three large ocelli present; frontal carina reduced; antennae 12-segmented, scape short, subequal to antennae segments three to 12; second antennal segment (pedicel) short, ovoid; mandibles small, with two teeth. Mesosoma bulky, elliptical in lateral view; mostly smooth and shining except some striae present on anterior portion of mesoscutellum and propodeum with dense punctation; entire mesosoma with numerous erect, elongate, whitish setae present; propodeum unarmed. Wings clear with light-amber veins; forewing with costal, basal, subbasal, submarginal, and discal cells present, pterostigma present; hindwing with costal, basal, and anal cells present. Waist two-segmented with erect setae; both nodes with dense, fine punctation; petiolar node with a dorsal median notch. Gaster shiny, with numerous erect, elongate whitish setae, especially posteriorly; genitalia visible at the apex.

Biology

Solenopsis invicta typically constructs a large, conical dirt mound above ground, which is an extension of the remainder of the colony located below the surface that may extend up to 1 meter deep. However, this species may also nest in mulch, rotting wood, the soil beneath objects, and numerous other locations. Colonies are almost always associated with open, disturbed habitats. Colonies may be either polygynous, with multiple queens or monogynous colonies, with only one queen. Monogyne colonies may be founded with a single queen or a group of queens, although in the latter case, only a single dominant queen will eventually be present. Though queens have a lifespan of several years, workers typically only live for several months. Mature colonies may be large, varying from 100,000 to more than 400,000 individuals (Tschinkel 2006). Fire ants are omnivorous and eat a wide variety of foods, such as arthropods, carrion of vertebrates, seeds, and numerous sweet substances

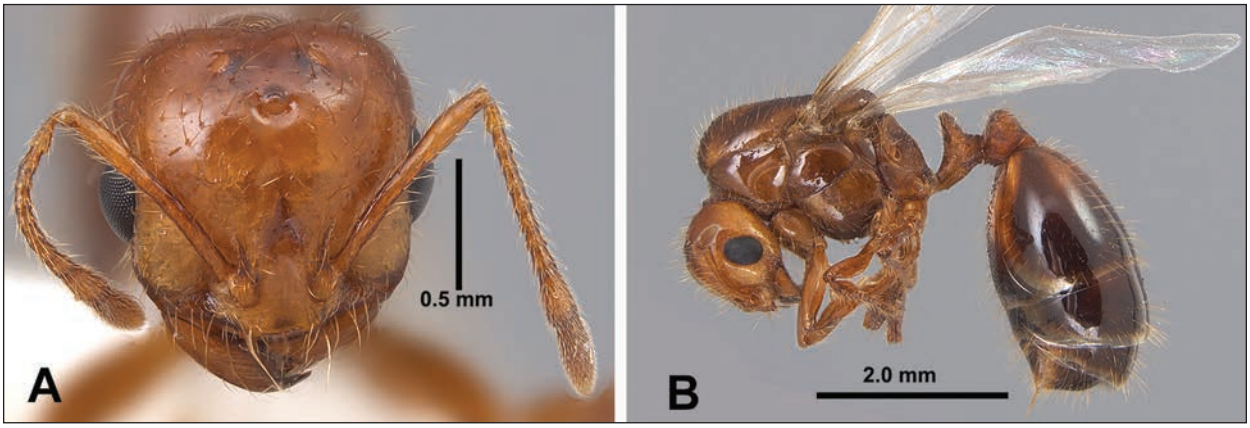
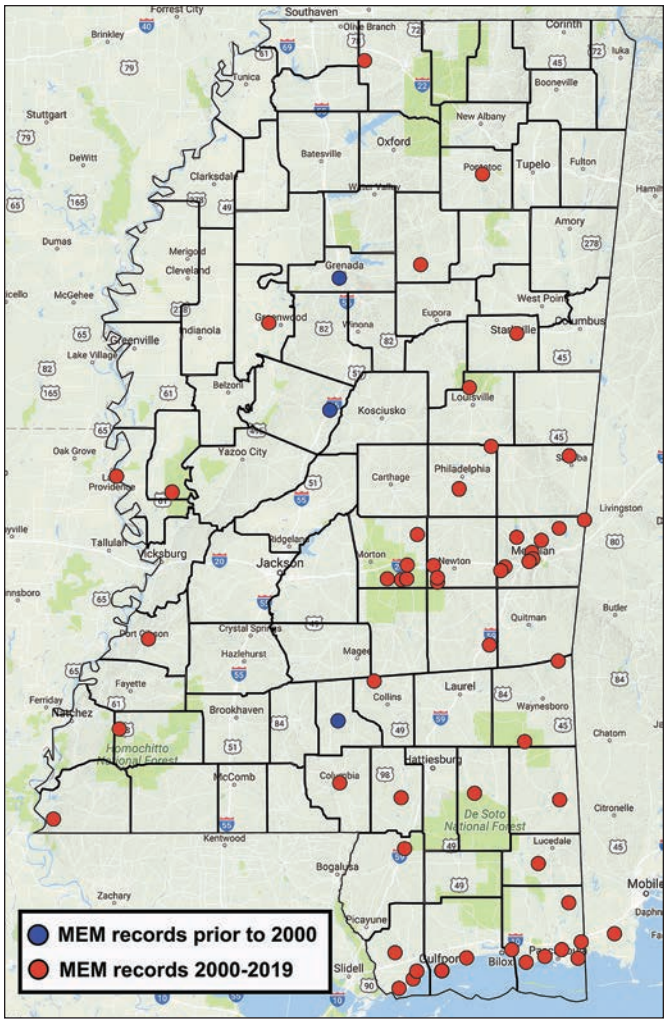


Figure 67. *Solenopsis invicta* alate queen (A) full face view and (B) lateral view.

including hemipteran-produced honeydew. Workers typically forage during the day on warm to hot days. Both pheromones and various chemicals are used as a means of communication for defense, foraging, and recruitment. Nuptial flights occur during warm seasons, which in the Southeast is a long period of time.

Pest Status

The red imported fire ant is a notorious stinging pest species that, together with the related *S. richteri,* causes billions of dollars in annual losses in the U.S. Damages related to fire ants were estimated to exceed $5.6 billion in 2003 (Lard et al. 2006). Because fire ants thrive in urban areas, their presence may be a deterrent to outdoor activities. When their colony is disturbed, *S. invicta* workers swarm out searching for the cause of the disturbance, and then numerous individuals aggressively sting the intruder. Because of the voracity of attacks and the number of stings received, victims may develop an allergy to their venom and potentially require medical treatment. Stings often result in itching, red bumps that in many individuals form hardened pustules that eventually dissipate. Fire ants can kill or seriously injure various animals, especially weak or sick individuals; however, the veracity of reports of fire ants killing various animals has been questioned by Tschinkel (2006). Nests are sometimes built under structures, such as pavements and foundations, where they may cause structural problems, Red imported fire ants also are known to damage equipment and infrastructures, which may cause negative impacts on businesses and affect



Map 21. *Solenopsis invicta* site records in Mississippi based on MEM specimens.

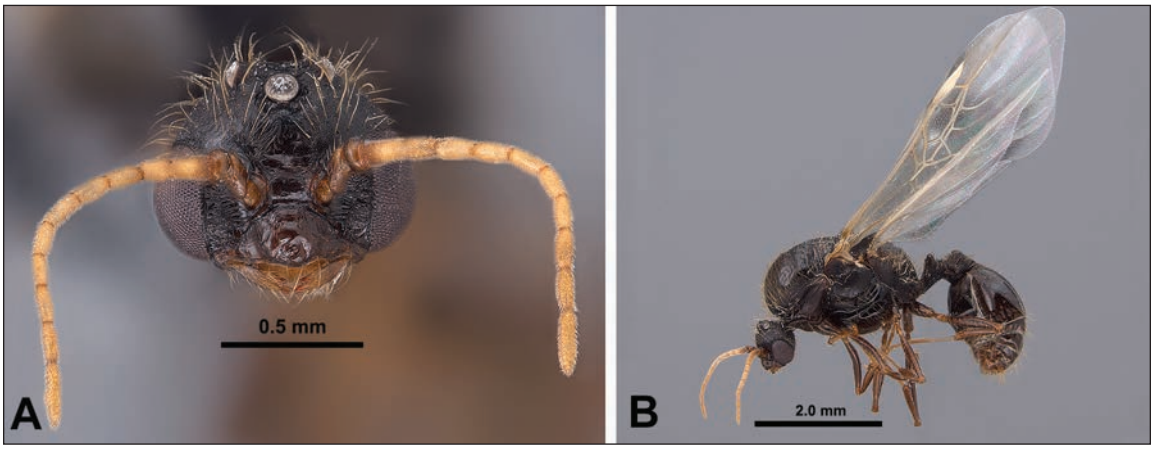


Figure 68. *Solenopsis invicta* male (A) full face view and (B) lateral view.

property values. Workers are apparently attracted to electricity and have been reported to short out electrical equipment. This species is also a serious agricultural pest that invades and damages a variety of crops. Large mounds on farmland can damage machinery and affect harvesting. Although fire ants are generally considered to be a serious pest species, they are beneficial at times as they consume large amounts of other insects, including many pest species.

Distribution

The red imported fire ant is thought to have been introduced into the U.S. through either Mobile, Alabama, or Pensacola, Florida, from Brazil sometime between 1933 and 1945 (Tschinkel 2006). *Solenopsis invicta* is extremely abundant and widespread in the southern half of Mississippi and along the western border following the Mississippi River northward with scattered records in the north central region, whereas *S. richteri* tends to be found in the northeastern part of Mississippi and northwestern portions of Alabama, with the hybrid found in a band between the two populations. This is not a static situation, and *S. invicta* appears to be on a continuous path northward, bounded only by temperature restraints. As *S. invicta* moves northward, so does the populations of *S. richteri* and their hybrid. In the U.S., this species is known to occur in Alabama, Arkansas, California, Florida, Georgia, Illinois, Louisiana, Missouri, Mississippi, North Carolina, New Mexico, Oklahoma, South Carolina, Tennessee, Texas, Virginia (AntWeb.org, AntWiki.org and MEM). In Mississippi, it is common throughout the southern half of the state and along the western border of the state as it follows the Mississippi River. Confirmed MEM county records include Attala, Calhoun, Clarke, Covington, Franklin, George, Greene, Grenada, Hancock, Harrison, Holmes, Issaquena, Jackson, Jasper, Jefferson Davis, Kemper, Lamar, Lauderdale, Leflore, Lowndes, Madison, Marion, Neshoba, Newton, Pearl River, Perry, Pontotoc, Rankin, Scott, Sharkey, Stone, Washington, Wayne, Wilkinson, and Winston Counties (Map 21).

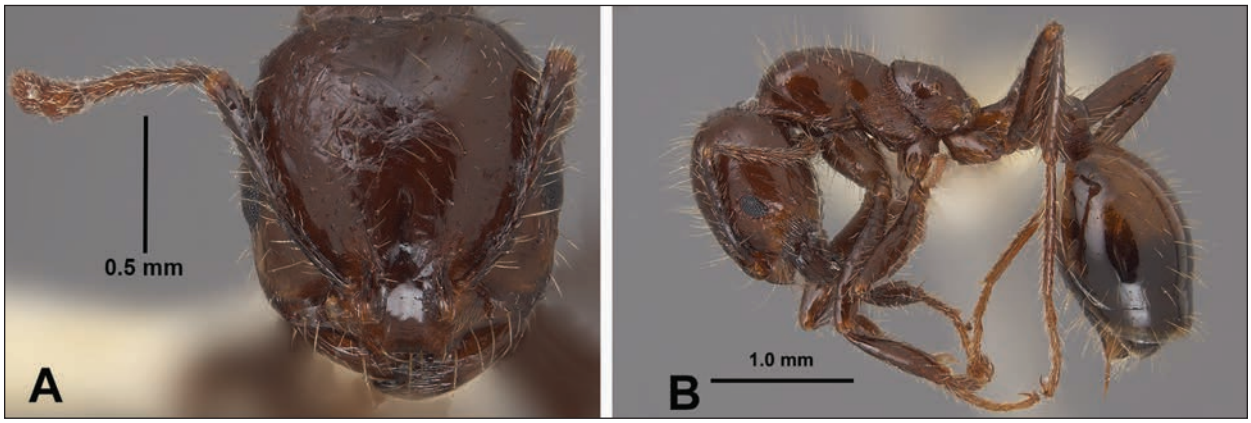


Figure 69. *Solenopsis richteri* worker (A) full face view and (B) lateral view.

Summary

Solenopsis richteri Forel (Myrmicinae), commonly referred to as the black imported fire ant (BIFA), is a serious economic pest in both Mississippi and Alabama. This ant can generally be recognized by its large mounds, polymorphic castes (varying sizes of workers), and 10-segmented antennae ending in a two-segmented club. However, because *S. richteri* hybridizes with *S. invicta*, it can be a challenge to differentiate from the hybrid, which may have characters of both species. The most reliable method for identification of this group is a cuticular hydrocarbon test, which some labs are now equipped to do. The imported fire ant is a major agricultural and urban pest that also causes both medical and environmental harm, resulting in a cost of many millions of dollars per year for Southeastern states.

Diagnosis

Workers of *S. richteri* are polymorphic, ranging in size from about 1.0–4.0 mm in overall length. They are brownish-black with a reddish-brown funiculus and a reddish spot on first gastral tergite. They have a 10-segmented antenna that terminates in a two-segmented club, lack propodeal spines, have a two-segmented waist, and have a prominent sting. These characteristics will serve to separate this genus from other genera in our region; however, species level identification is difficult. In Mississippi, *S. richteri* is most similar to *S. invicta* Forel, which is generally redder in overall color, does not have black antennal scapes, and lacks a strongly pronounced humeral area on the pronotum. These two closely related species produce a hybrid, *Solenopsis invicta* X *richteri,* which has characteristics of both. The most reliable method for identification of this group is a cuticular hydrocarbon test, which some labs are now equipped to do.

Descriptions

Worker (Figure 69): Polymorphic, small to medium-sized (HL 1.30–1.46 mm, HW 1.19–1.39 mm, SL 1.04–1.13 mm, EL 0.20–0.23 mm, MeSL 1.52-1.65) (n=5) (MEM specimens). Head, mesosoma, waist, coxae, femora, tibia, and first tarsal segment brownish-black; gaster usually darker with a large reddish-orange spot of the first segment of the gaster; scape blackish, funiculus and tarsal segments two to five reddish-brown. Head slightly longer than wide, rounded rectangular; smooth and shining except for piligerous punctures from which light-colored erect setae arise; posterior border of head flat to slightly convex in smaller workers to having strong posterior lobes and strong medial indention in larger workers; eyes small, located laterally at about the midpoint of the head; antennae 10-segmented with a two-segmented club; clypeus tridentate with two lateral toothlike projections and one smaller toothlike projection medially; mandibles triangular with five prominent teeth. Mesosoma mostly smooth and shining, lacking sculpture except for transverse striae on katepisternum and lower portion of propodeum; numerous long, erect setae present; humeral pronotal process present on larger workers metanotal groove distinct and well defined; propodeum unarmed, lacking spines. Gaster smooth and shining with erect setae; sting present.

Queen (Description from Buren 1972): Large (HL 1.25–1.30 mm, HW 1.35–1.40 mm, SL 1.02–1.06 mm, MeSL 2.55– 2.69 mm). Coloration similar to that of

workers: Head, scapes, mesosoma, legs, and petiole brownish-black; gaster nearly black but with a bright orange spot on the anterior portion of the first gastric tergite; postpetiole or the rear portion of it usually the same color as the gastral spot. Head about as wide as long, rounded square; smooth and shining with scattered erect setae; posterior margin median with a crease-like excision; eyes large and situated laterally at the midpoint of the head; three ocelli present; antennae 11-segmented with a two-segmented club; scapes slightly exceed posterior margin of head; clypeus tridentate, median tooth minute, with two anteriorly diverging carinae; mandibles with four teeth. Mesosoma rounded rectangular, almost square, with mesoscutum rounded anteriorly; mostly smooth and shining except some striae present on anterior portion of mesoscutellum and propodeum with numerous transverse striae; numerous erect setae present dorsally and on propodeum but sparse on pronotum and mesopleura; dorsal surface relatively flat; four wings or wing scars present; propodeum unarmed; declivity straight, almost 90°. Wings clear with light-amber veins; forewing with costal, basal, subbasal, submarginal, and discal cells present, pterostigma present; hindwing with costal, basal, and anal cells present. Waist two-segmented, anterior faces of petiole and postpetiole with moderately dense, appressed pubescence; erect hairs numerous and present on all surfaces; petiolar node narrower than the postpetiolar node in lateral view; sides of petiole finely punctate and roughened. Gaster shining with long erect setae; sting present.

Male (Figure 70) (Description from Buren 1972 and MEM specimen): Medium-sized, about the size of large worker (HL 0.76–0.84 mm, HW 1.02–1.06 mm, MeSL 2.60–2.69 mm). Entire body black except funiculus, which is yellowish-brown to reddish-brown; wings transparent. Head small compared to the mesosoma, circular; shiny with course rugae fading anteriorly to densely punctate posteriorly, clypeus mostly lacking sculpture; with numerous long, erect, whitish setae present; eyes large, more than twice the head length, located on the anterior half of the head; three large ocelli present; frontal carina reduced; antennae 12-segmented, scape short, subequal to antennae segments three to 12; second antennal segment (pedicel) short, ovoid; clypeus without trace of carinae; mandibles small, with two teeth. Mesosoma bulky, elliptical in lateral view; mostly smooth and shining except some striae present on anterior portion of mesoscutellum and propodeum with dense punctation; entire mesosoma with numerous erect, elongate, whitish setae present; propodeum unarmed. Wings clear with light-amber veins; forewing with costal, basal, subbasal, submarginal, and discal cells present, pterostigma present; hindwing with costal, basal, and anal cells present. Waist two-segmented, both nodes with dense, fine punctation; petiolar node with a dorsal median notch. Gaster shiny, with numerous erect, light-colored, elongate setae, especially posteriorly genitalia visible at the apex.

Biology

Black imported fire ants are most common in urban areas, where they nest in open, disturbed sites such as lawns, fields, and roadsides. Similar to the related *S. invicta, S richteri* also constructs a large, conical dirt mound above ground, which is an extension of the remainder of the colony located below the surface. Colonies are monogynous, with only one queen, and may have up over 200,000 individuals in a large colony. Fire ants are omnivorous and eat a wide variety of foods such as arthropods, dead mammals and other animals, seeds, and numerous sweet substances including hemipteran-produced honeydew. Workers typically forage during the day on warm to hot days. Pheromones and semiochemicals are used as a means of communication for defense, foraging, and recruitment. Nuptial flights occur during warm seasons.

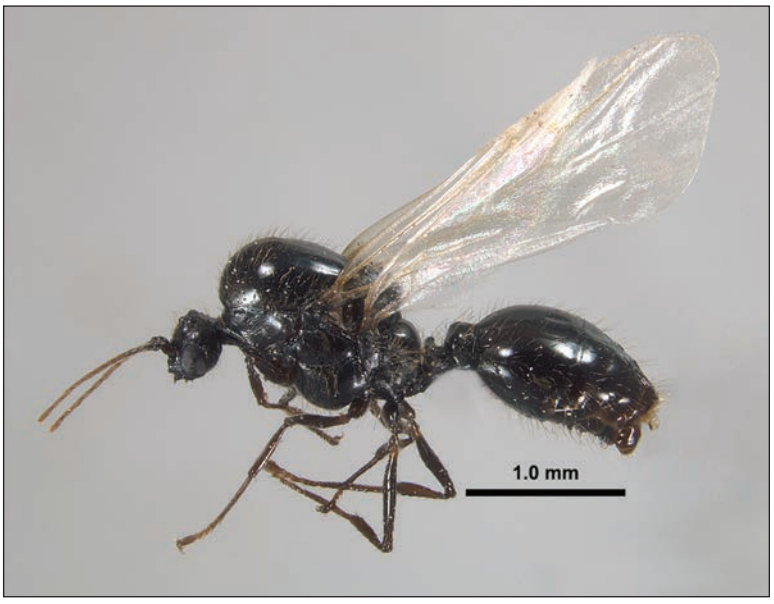


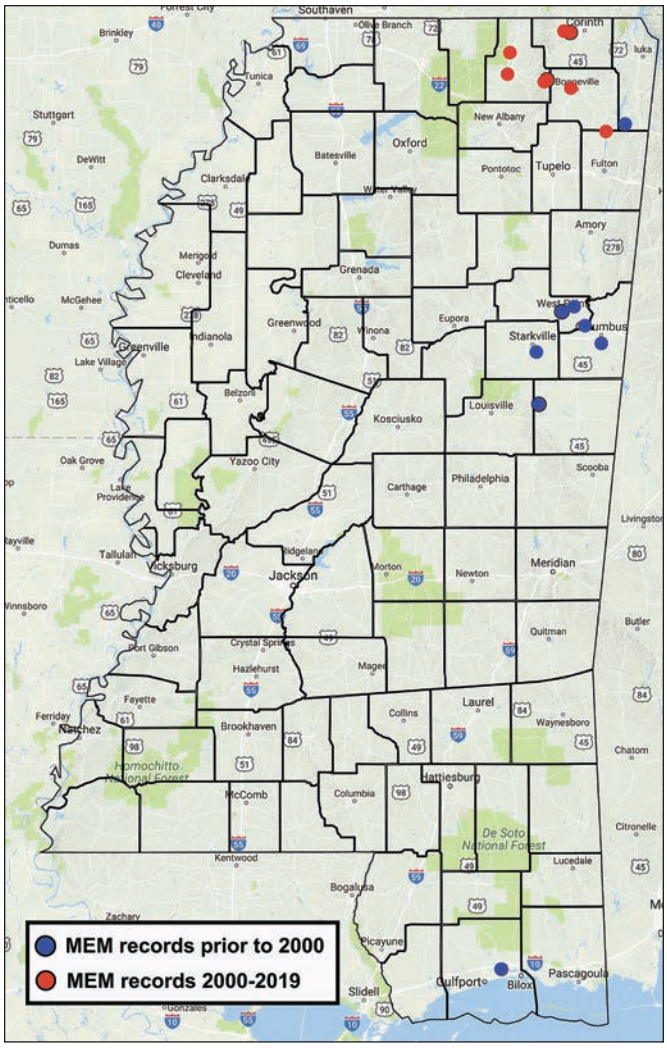
Figure 70. *Solenopsis richteri* male lateral view.

Pest Status

The negative effects of the black imported fire ant are very similar to those of the red imported fire ant. However, the effects are on a smaller scale as this species is less common in the U.S. Because fire ants thrive in urban areas, their presence can be a deterrent to outdoor activities. The fire ant sting is potent and may result in itchy, red bumps that in some individuals form hardened pustules that will eventually go away. Some victims suffer anaphylactic shock from the stings and require medical treatment. Fire ants also may seriously injury or even kill other animals, especially weak or sick individuals. Nests may be constructed under structures such as pavements and foundations, where they may cause structural problems. Fire ant workers have been reported to short out electrical equipment. Imported fire ants are serious agricultural pests that invade and damage a variety of crops and their mounds can damage machinery and affect harvesting.

Distribution

The black imported fire ant is thought to have been introduced into the U.S. from South America, probably Argentina, sometime around 1918 (Tschinkel 2006). In the U.S., this species is known from Alabama, Arkansas, Mississippi, North Carolina, Tennessee, and Virginia (antweb.org, antwiki.org, and MEM). Confirmed MEM county records of *S. richteri* include Alcorn, Clay, Oktibbeha, Prentiss, and Tippah (Map 22); however, historically, *S. richteri* was likely found throughout much of the northern half of the state before being pushed northward by *S. invicta.*



Map 22. *Solenopsis richteri* site records in Mississippi based on MEM specimens.

Strumigenys epinotalis Weber, 1934 — "tree-hole mustache ant"

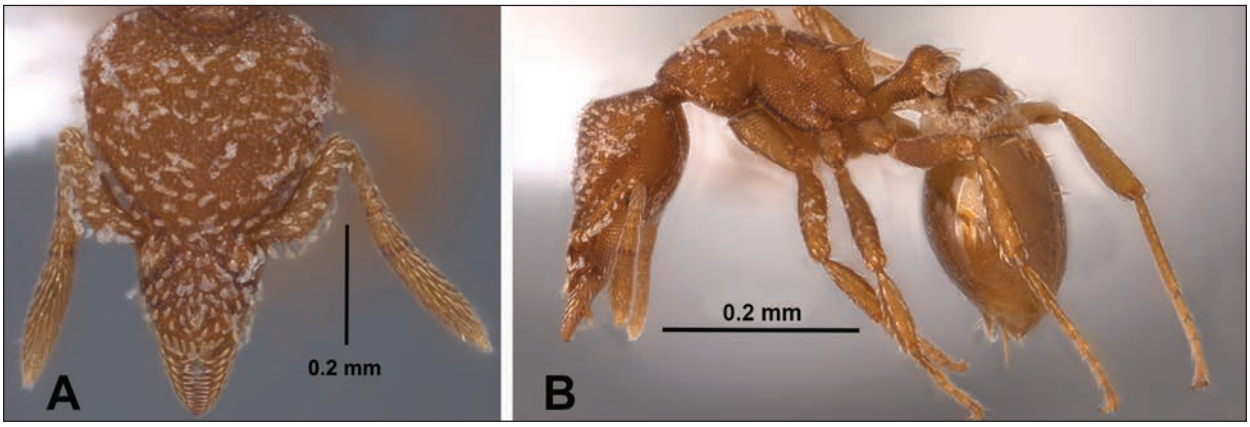


Figure 71. *Strumigenys epinotalis* worker (A) full face view and (B) lateral view.

Summary

Strumigenys epinotalis Weber (Myrmicinae) is a minute (TL 1.9–1.95 mm) arboreal attine ant previously known only from Brazil, Costa Rica, Ecuador, and southern Mexico, but it was recently discovered to occur in southern Alabama, Florida, and southern Louisiana (Chen et al. 2012, MEM records). Here, we report the first occurrence of *S. epinotalis* from Mississippi.

Diagnosis

This species is easily differentiated from other species known from the U.S. by the combination of having the third tooth (from basal lamella) on mandible longer than the other teeth, the mesosoma of the worker being completely reticulate-punctate, and having a curved row of spoon-shaped hairs on the pronotal dorsum, a distinct propodeal lamella, a ventral spongiform crest beneath the petiole, and fan-shaped patches of spongiform tissue on the petiole and postpetiole. Currently, the only other species reported from the U.S. with which *S. epinotalis* might be confused is *S. margaritae* Forel, another introduced species in the *schulzi* group. *Strumigenys margaritae* is the only other species known to occur in the U.S. that has sculpturing on the entire side of the mesosoma; however, *S. margaritae* lacks a curved row of spoon-shaped hairs on the pronotal dorsum, has much longer propodeal spines, lacks a propodeal lamella, lacks spongiform bodies beneath the petiole, and has reduced spongiform tissue present beneath the postpetiole.

Descriptions

Worker (Figure 71): Minute (HL 0.52–0.58 mm, HW 0.39–0.42 mm, ML 0.1–0.11 mm, EL 0.06–0.08 mm, SL 0.25–0.27 mm, MeSL 0.55–0.58 mm) (n=3) (MEM specimens). Overall reddish-brown in color. Head pyriform, widest posteriorly; entire head including clypeus with fine microreticulation; dorsum of clypeus with numerous clavate setae directed anteriorly or away from midline of clypeus; clypeal margin with a fringe of clavate setae all curving anteriorly toward midline of clypeus; remainder of head with slightly larger clavate to spoon-shaped setae that curve toward midline of head; elongate flagelliform cephalic setae absent; leading edge of scape with a row of elongate, curved setae, all directed toward the base of the scape or downward; eye large with five to seven ommatidia in longest diameter; antenna six-segmented, scape short, apical flagellomere greatly enlarged forming a two-segmented club with preapical flagellomere; clypeus somewhat pentagonal shaped, narrowing anteriorly, and with anterior margin slightly convex; mandibles subtriangular, lacking diastema; nine acute teeth present following basal lamella; third tooth from basal lamella spiniform, elongate and distinctly longer than other teeth, with subsequent teeth alternating in length with the fifth being longer than the fourth and the seventh being longer than the sixth, and the remaining two teeth smaller and blunter. Mesosoma entire, smoothly arched in profile view, with fine reticulation, dorsum with large, scattered semierect clavate setae, elongate, flagellate setae lacking; propodeum with a pair of small spines directed upward; propodeal declivity with a spongiform lamella. Waist two-segmented, with dense microreticulation; petiole pedunculate, node rounded rectangular in dorsal view, several elongate clavate setae present posterodorsally, a narrow curtain of spongiform tissue

present ventrally, and spongiform tissue present posteriorly; postpetiole rounded rectangular, about twice as wide as petiole (in dorsal view), with a few scattered erect, clavate setae present dorsally, and with thick spongiform tissue present posteriorly and ventrally. Gaster shiny, with a few scattered appressed pubescent setae; scattered erect, clavate setae present dorsally; sting present.

Queen (Figure 72): Minute, slightly larger than worker (HL 0.59 mm, HW 0.45 mm, EL 0.14 mm, ML 0.11 mm, SL 0.31 mm, MeSL 0.68 mm, FWL 1.80 mm) (n=1) (MEM). Overall reddish-brown in color. Head pyriform, widest posteriorly; entire head including clypeus with fine microreticulation; dorsum of clypeus with numerous clavate setae directed anteriorly or away from midline of clypeus; clypeal margin with a fringe of clavate setae all curving anteriorly toward midline of clypeus; remainder of head with slightly larger clavate to spoon-shaped setae that curve toward midline of head; elongate flagelliform cephalic setae absent; leading edge of scape with a row of elongate, curved setae, all directed toward the base of the scape or downward; eye large with numerous ommatidia; three ocelli present; antenna six-segmented, scape short, apical flagellomere greatly enlarged forming a two-segmented club with preapical flagellomere; clypeus somewhat pentagonal shaped, narrowing anteriorly, and with anterior margin slightly convex; mandibles subtriangular, lacking diastema; nine acute teeth present following basal lamella; third tooth from basal lamella spiniform, elongate and distinctly longer than other teeth, with subsequent teeth alternating in length with the fifth being longer than the fourth and the seventh being longer than the sixth, and the remaining two teeth smaller and blunter. Mesosoma squarish in profile, with fine reticulation except katepisternum, which is mostly shiny; mesosomal dorsum with large, scattered semi-erect clavate setae; elongate, flagellate setae lacking; mesoscutum and mesocutellum smoothly arched in profile view; mesoscutum not completely overhanging pronotum in dorsal view; mesoscutellum raised above propodeum; propodeum with a pair of small spines directed upward; propodeal declivity with a spongiform lamella. Wings, if present, lacking pigmented veins, short brown pterostigma present, with fringe of setae along wing edges apically and on ventral sides of wings to about midway toward base. Waist two-segmented, with dense microreticulation; petiole pedunculate, node rounded rectangular in dorsal view, several elongate clavate setae present posterodorsally, a narrow curtain of spongiform tissue present ventrally, and spongiform tissue present posteriorly; postpetiole rounded rectangular, about twice as wide as petiole (in dorsal view), with a few scattered erect, clavate setae present dorsally, and with thick spongiform tissue present posteriorly and ventrally. Gaster shiny, with a few scattered appressed pubescent setae; scattered erect, clavate setae present dorsally; sting present.

Male (unknown).

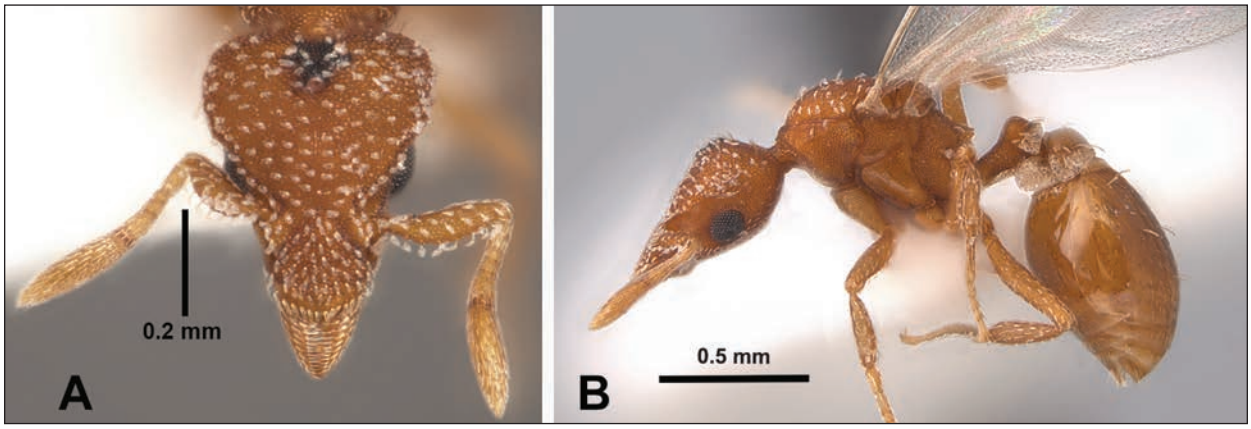


Figure 72. *Strumigenys epinotalis* alate queen (A) full face view and (B) lateral view.

Biology

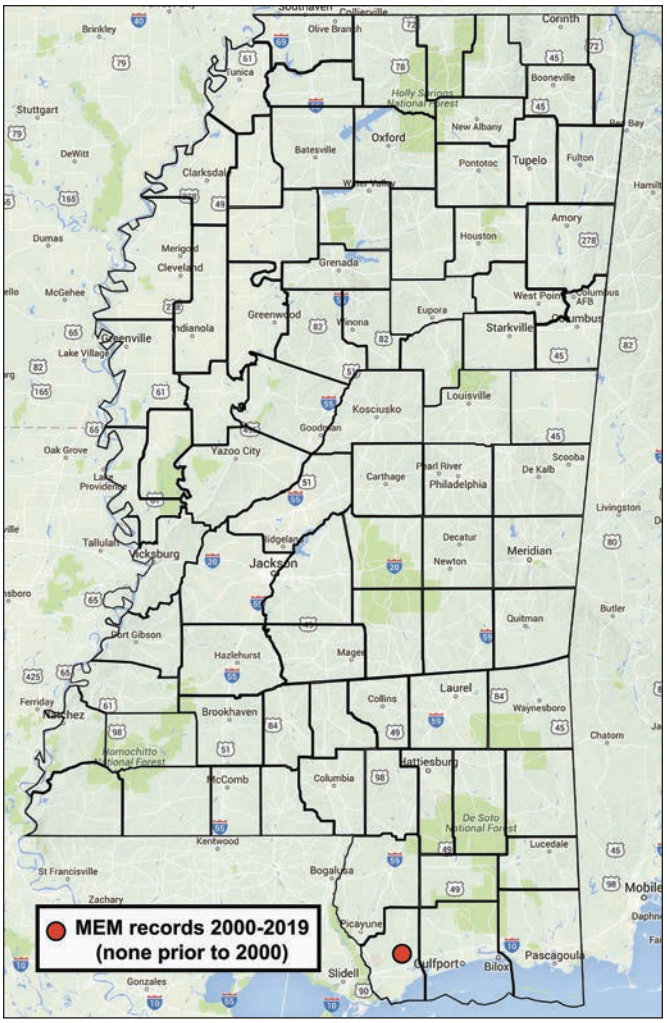
This species appears to be arboreal. Specimens have been collected in scrub habitat near a bayhead by Mark Deyrup in Highlands County, Florida (MEM data). Specimens from Louisiana were collected in cypress-tupelo swamps in Ascension, Gramercy, and Jefferson Parishes, in floating pitfall traps or in arboreal pitfall traps (Chen et al. 2012). Alabama and Mississippi records were from Lindgren funnel traps.

Pest Status

This species is not considered to be a pest species. Its effects, if any, on other native *Strumigenys* species in the region have not been studied.

Distribution

Strumigenys epinotalis is thought to be native to Central or South America (Chen et al. 2012). In the U.S., this species has been collected in Alabama, Florida, Louisiana, and Mississippi (MEM). The MEM has a single record of this species from Hancock County (U.S., Mississippi, Hancock County, Kiln, 30.4264 -89.4368, 02–18 June 2014, T. C. Lockley, Lindgren funnel trap with Pine Shoot Beetle lure) (Map 23).



Map 23. *Strumigenys epinotalis* site records in Mississippi based on MEM specimens.

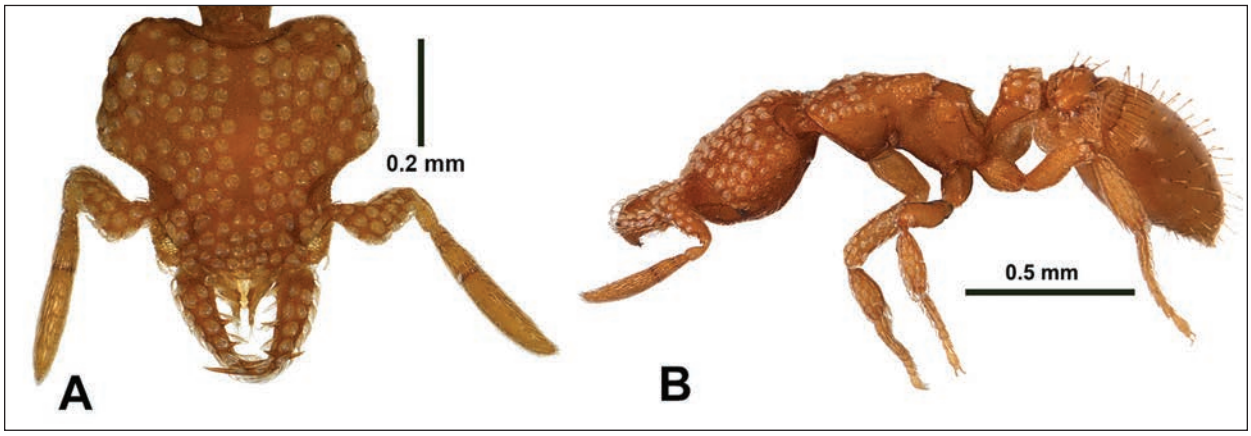


Figure 73. ***Strumigenys hexamera*** **worker (A) full face view and (B) lateral view.**

Summary

Strumigenys hexamera (Brown) (Myrmicinae) is a tiny predatory ant that feeds on minute soil arthropods. Originally from East Asia (MacGown and Wetterer 2012), *S. hexamera* was recently introduced to North America, apparently through human commerce and first reported by Deyrup (1988).

Diagnosis

In the U.S., *Strumigenys hexamera* can be distinguished from other ant species by its minute size (TL 2.0–2.1 mm), six-segmented antennae, two-segmented waist, presence of numerous large, circular, translucent setae on the head and body, and by the elongate curved mandibles, each of which terminate with a long tooth that overlaps the other mandible (when mandibles are fully closed).

Descriptions

Worker (Figure 73): Minute (HL 0.50–0.53 mm, HW 0.53–0.55 mm, ML 0.18–0.22 mm, SL 0.28–0.31 mm, MeSL 0.57–0.60 mm) (n=3) (MEM specimens). Overall reddish-brown in color. Head widest posteriorly, edges squared, then abruptly tapering to mandibles; entire head with fine microreticulation; face, clypeus, mandible, and scape with large, appressed, circular, somewhat translucent setae; eyes minute, located on side of head beneath antennal scrobe; antenna six-segmented, scape short, apical flagellomere greatly enlarged forming a two-segmented club with preapical flagellomere; mandibles elongate, in full face view only three teeth are visible including two preapical teeth and one elongate apicodorsal tooth which extends beyond the outer margin of the opposite mandible at closure. Entire mesosoma with fine reticulation, dorsum with large, appressed, circular, somewhat translucent setae; promesonotum flattened, slightly raised above propodeum; propodeum with a pair of small spines directed rearward; propodeal declivity with a narrow spongiform lamella. Waist two-segmented, with dense microreticulation and with large, appressed, circular, somewhat translucent setae present dorsally; petiole pedunculate, node rounded rectangular in dorsal view, a heavy curtain of spongiform tissue present ventrally; postpetiole rounded rectangular, about twice as wide as petiole (in dorsal view), with a few scattered erect, apically forked setae present dorsally, and with thick spongiform tissue present posteriorly and ventrally. Gaster shiny, with only a few scattered appressed pubescent setae; with scattered erect, apically forked setae present dorsally; sting present.

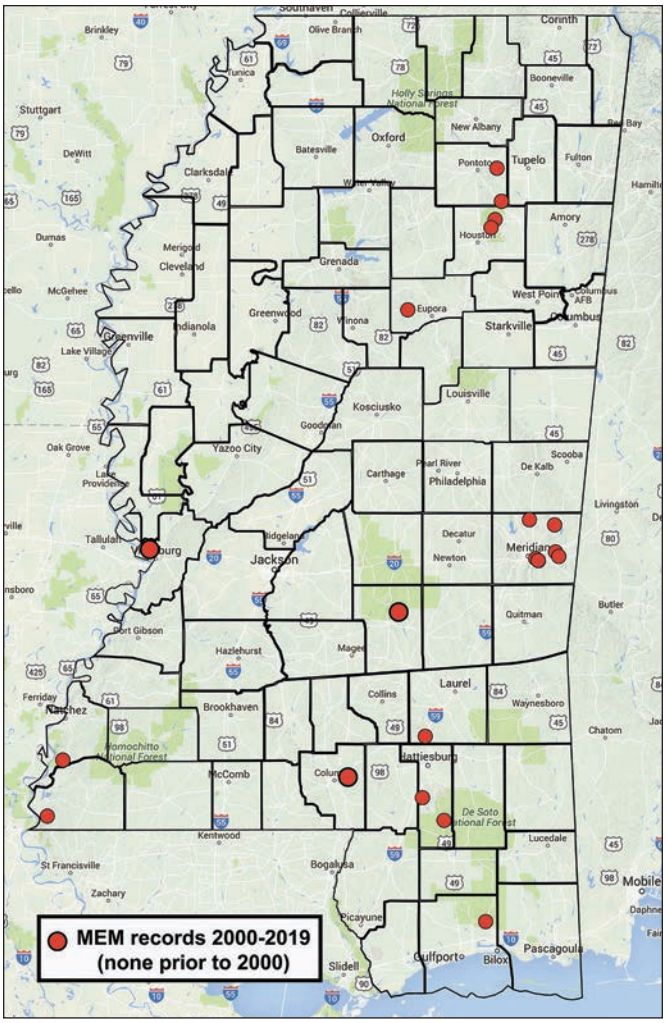
Queen (Figure 74): Small, slightly larger than worker (HL 0.54–0.56 mm, HW 0.60–0.6.3 mm, ML 0.23–0.25 mm, SL 0.23–0.24 mm, MeSL 0.75–0.76 mm) (n=3) (MEM specimens). Overall reddish-brown in color. Head widest posteriorly, edges squared, then abruptly tapering to mandibles; entire head with fine microreticulation; face, clypeus, mandible, and scape with large, appressed, circular, somewhat translucent setae; eyes large, multifaceted, located on side of head beneath antennal scrobe; three ocelli present; antenna six-segmented, scape short, apical flagellomere greatly enlarged forming a two-segmented club with preapical flagellomere; mandibles elongate, in full face view only three teeth are visible including two preapical teeth and one elongate apicodorsal tooth which extends beyond

the outer margin of the opposite mandible at closure. Entire mesosoma with fine reticulation, dorsum with large, appressed, circular, somewhat translucent setae; pronotum visible dorsally as a "U" shape; pronotum, mesoscutum, and mesoscutellum forming a slightly convex arc, elevated above propodeum; propodeum with a pair of short, triangular spines directed rearward; propodeal declivity with a narrow spongiform lamella. Wings, if present, lacking pigmented veins, short triangular stigma present, with fringe of setae along wing edges apically and on ventral sides of wings to about midway toward base. Waist two-segmented, with dense microreticulation and with large, appressed, circular, somewhat translucent setae present dorsally; petiole pedunculate, node rounded rectangular in dorsal view, with a narrow curtain of spongiform tissue present ventrally; postpetiole rounded rectangular, about twice as wide as petiole (in dorsal view), with a few scattered erect, apically forked setae present dorsally, and with thick spongiform tissue present posteriorly and ventrally. Gaster shiny, with longitudinal striae present at anterior portions of first tergite; scattered appressed pubescent setae present and scattered erect, apically forked setae present dorsally; sting present.

Male (unknown).

Biology

Unlike many of our other exotic ant species in the U.S., *S. hexamera* thrives in natural wooded habitats. MEM collections of this species have been primarily from rich mesic hardwood or mixed pine-hardwood



Map 24. *Strumigenys hexamera* site records in Mississippi based on MEM specimens.

Figure 74. *Strumigenys hexamera* alate queen (A) full face view and (B) lateral view.

forests, often in areas with hilly terrain. *Strumigenys hexamera* is a specialized ambush predator of small long-bodied soil arthropods, such as Diplura, Chilopoda, and Collembola (Masuko 1984). Masuko (2009) reported that "Diplura composed 60% of the prey in the field material." This prey preference is unusual compared with most other species of *Strumigenys* whose biologies have been studied with prey selection often being Collembola (Masuko 2009). As described by Masuko (1984), foraging *S. hexamera* workers hunt for their prey in small crevices in the soil. Upon encountering prey, *S. hexamera* moves to a crouching position, pulls its antennae back into recessed antennal scrobes lining the side of the head, closes its mandibles, and remains motionless. The ant may remain still for more than 20 minutes while it waits for the prey to advance and crawl on top of her head. *Strumigenys hexamera* is uniquely equipped for this situation, having a flattened head and slightly upturned mandibles, each of which terminates with a sharp apical tooth, allowing the ant to strike at prey passing overhead. When the prey is in the correct position, the ant opens its mandibles and suddenly snaps them shut, impaling the prey with the apical teeth. *Strumigenys hexamera* has been reported to coat its body with soil and other detritus using its forelegs, a behavior that may camouflage the ant's odor from the prey (Masuko 1984).

Pest Status

This species is not considered to be a pest species. Its effect, if any, on other native *Strumigenys* species in the region has not been studied.

Distribution

Strumigenys hexamera is native to Japan but is now well established in the Southeast with records from Alabama, Florida, Louisiana, and Mississippi (AntWeb.org and MEM). MEM county records from Mississippi include Adams, Chickasaw, Clarke, Clay, Forrest, Franklin, George, Harrison, Jasper, Jefferson, Jefferson Davis, Jones, Lauderdale, Lee, Lowndes, Marion, Pontotoc, Scott, Warren, and Wilkinson (Map 24).

Strumigenys margaritae Forel, 1893 – "Margaret's mini trapjaw ant"

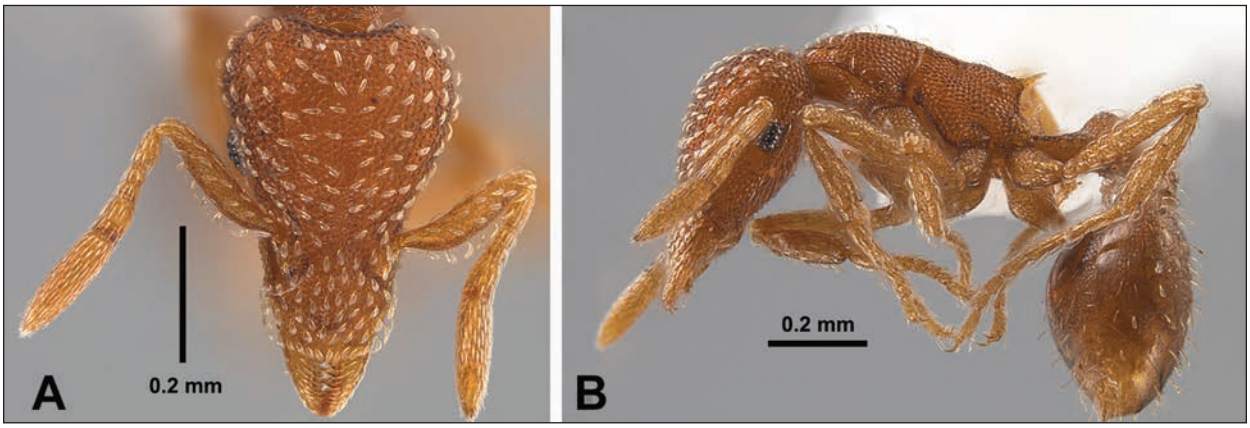


Figure 75. ***Strumigenys margaritae*** **worker (A) full face view and (B) lateral view.**

Summary

Strumigenys margaritae Forel (Myrmicinae) is a tiny (TL 1.86–2.1 mm) predatory ant native to the New World. It is known from northern South America, Central America, Mexico, the West Indies, and the Southeast from Texas to Florida (MacGown and Wetterer 2013).

Diagnosis

Strumigenys margaritae can be separated from other *Strumigenys* species in the U.S. by the following combination of features: relatively short, triangular mandibles with teeth along entire inner borders; presence of reticulate-punctate sculpture on the entire side of the mesosoma; elongate, acute tipped propodeal spines directed posteriorly and slightly upward; lack of spongiform tissue beneath the petiole and base of gaster; and first gastral tergite with rough, grainy, shagreened sculpture.

Descriptions

Worker (Figure 75): Minute (HL 0.52–0.58 mm, HW 0.36–0.45 mm, ML 0.10–0.15 mm, SL 023–0.30 mm, MeSL 0.48–0.56 mm) (measurements from two MEM specimens and Bolton 2000). Entire body reddish-brown. Head pyriform, concave posteriomedially; entire head including clypeus with dense microreticulation; numerous, regularly spaced, hyaline, clavate setae directed anteriorly and inward, with setae on clypeal border forming a tight fringe; eyes large, located about midway on sides of head near ventral edge (in lateral view) and along bottom edge of antennal scrobe; three ocelli present; mandibles elongate triangular; diastema lacking, serially dentate with seven sharply triangular teeth followed by four small denticles and terminating in slightly enlarged apical tooth; antenna six-segmented, scape short, leading edge of scape with a row of hyaline, clavate setae, one or more of which are curved toward the base of the scape, apical flagellomere greatly enlarged forming a two-segmented club with flagellomere three. Mesosoma with dense microreticulation present dorsally and laterally; scattered semierect, clavate setae present dorsally; dorsum entire in lateral view, promesonotal suture present but not deep; propodeum with two prominent spines directed posteriorly, lacking spongiform curtain posteriorly. Waist two-segmented, with dense microreticulation and scattered clavate setae; petiole distinctly pedunculate, in dorsal view, node rounded rectangular, spongiform tissue present posteriorly but lacking ventrally; postpetiole rounded rectangular, about twice as wide as petiole (dorsal view); spongiform tissue present posteriorly and ventrally. Gaster with shagreened texture, with scattered, semierect to erect clavate setae; sting present.

Queen (Figure 76): Minute, slightly larger than worker (HL 0.62 mm, HW 0.41 mm, ML 0.20 mm, SL 0.32 mm, MeSL 0.72 mm) (n=1) (MEM specimen). Entire body reddish-brown. Head pyriform, entire head including clypeus with dense microreticulation; numerous regularly spaced, hyaline, clavate setae directed anteriorly and inward; eyes large, located about midway on sides of head near ventral edge (in lateral view) and along bottom edge of antennal scrobes: mandibles elongate triangular, diastema lacking, serially dentate with seven sharply triangular teeth followed by four small denticles and terminating in slightly enlarged apical tooth; antenna six-segmented, scape short;

leading edge of scape with a row of hyaline, clavate setae, one or more of which are curved toward the base of the scape, apical flagellomere greatly enlarged, forming a two-segmented club with flagellomere three. Mesosoma squared, with dense microreticulation; scattered semierect, clavate setae present, especially dorsally; propodeum with two stout, prominent spines directed posteriorly. Waist two-segmented, with dense microreticulation and scattered clavate setae; petiole distinctly pedunculate, in dorsal view, node rounded rectangular, spongiform tissue lacking; postpetiole ovoid, about twice as wide as petiole (dorsal view); spongiform tissue reduced, present posteriorly and ventrally. Gaster with shagreened texture; scattered, semierect to erect clavate setae present; sting present.

Male: Unknown.

Biology

In the neotropical part of its range, *S. margaritae* has been collected most commonly in lowland wet forests, tropical moist forests, mesophil forests, lowland rainforests, tropical rainforests, and montane rainforests (AntWeb data). In the U.S., it has been most often collected in drier, more open areas such as prairie remnants, pine savannas, scrub, and open disturbed sites. It has been collected most often from litter samples using Winkler sacks and Berlese funnel extractions but also by beating or sweeping vegetation, baiting, visual searches, in flight interception traps, and in malaise traps (AntWeb data). Specimens from Alabama and Mississippi were collected in Black Belt Prairie remnants by sweeping native vegetation or sifting dead native grasses. Numerous specimens were collected from southern Louisiana from pitfall traps located in longleaf pine savanna habitat with open grassy understories. This species has been

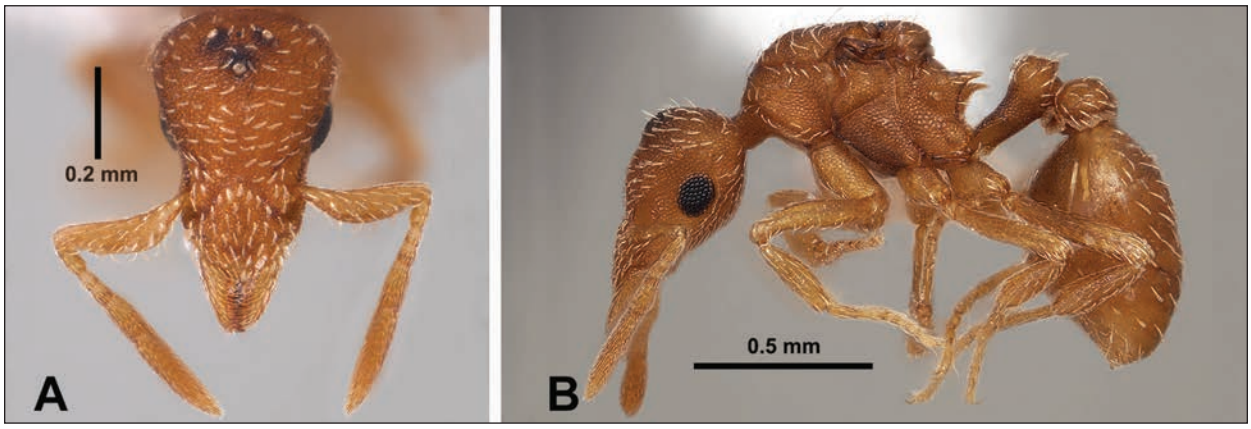


Figure 76. *Strumigenys margaritae* dealate queen (A) full face view and (B) lateral view.

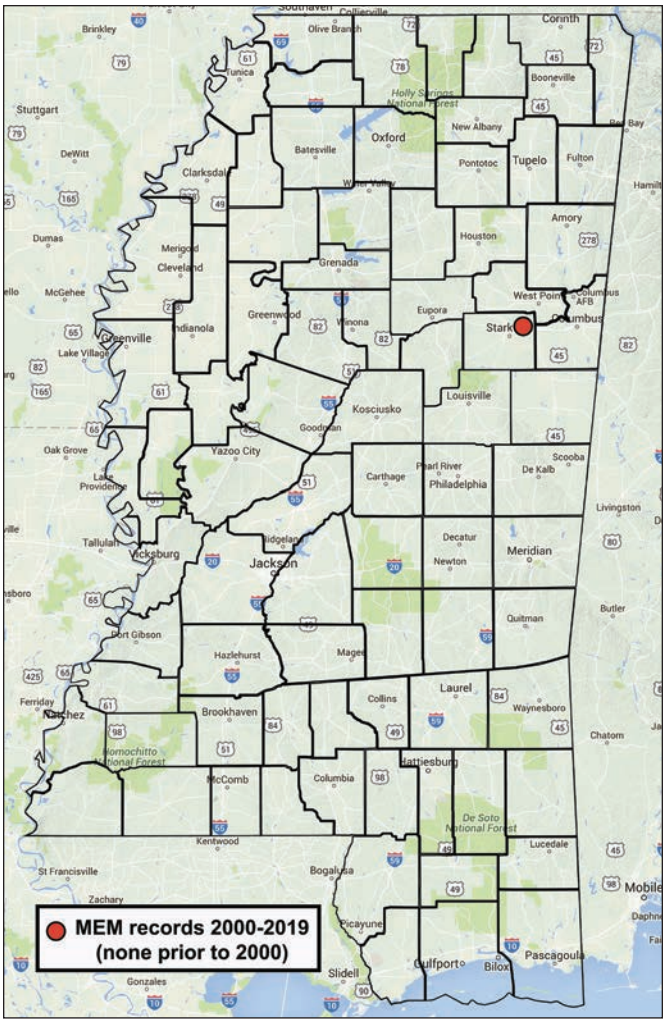
collected in deep pine and oak litter in waterway scrub in Florida (AntWeb data). Paul Davison (Pers. Comm.) collected a nest of this species in a plaster trap nest that he designed and placed under *Quercus alba* in upland hardwood forest habitat in northwestern Alabama. He noted that in contrast to the other *Strumigenys* species that he had collected with his trap nests, *S. margaritae* was the only one that constructed an earthen shelter insider the plaster cavity. Unlike some of its *schulzi* group relatives that may actually nest in trees (i.e., *S. epinotalis*, Chen et al. 2012), *S. margaritae* appears to prefer lower vegetation (Longino 2012), and although specimens may be collected while foraging in litter, perhaps sweep samples would yield more specimens.

Pest Status

This species is not considered to be a pest species. Its effect, if any, on other native *Strumigenys* species in the region has not been studied.

Distribution

Strumigenys margaritae is native to the Neotropics and has a widespread distribution throughout much of Central America, Mexico, and the Caribbean. The distribution of this species in the U.S. appears to be restricted to Southern states and is known from Alabama, Florida, Georgia, Louisiana, Mississippi, and Texas (AntWeb.org and MEM). In Mississippi, this species has been collected only in Oktibbeha County (MEM record) (Map 25).



Map 25. *Strumigenys margaritae* site records in Mississippi based on MEM specimens.

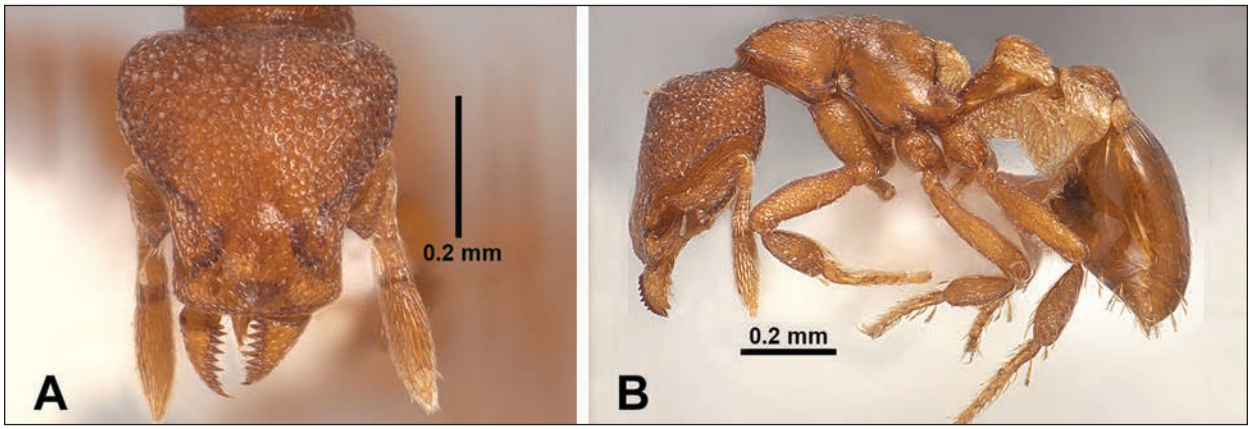


Figure 77. ***Strumigenys membranifera*** **worker (A) full face view and (B) lateral view.**

Summary

Strumigenys membranifera Emery (Myrmicinae) has a pantropical distribution and has been spread around the world through human commerce (Wetterer 2011). Unlike some other *Strumigenys* species that possess elongate mandibles, *S. membranifera* has triangular mandibles. They can also be found nesting in a variety of different locations and tend to venture into dry, open soil more than other species in the genus.

Diagnosis

Strumigenys membranifera workers are minute (TL ≈ 1.6–2.0 mm), reddish-brown in color, with a wedge-shaped head, six-segmented antenna that terminates in a two-segmented club, triangular-shaped mandibles with seven teeth, a shiny mesosoma, a sharp lateral ridge along the pronotum, and a large curtain of spongiform tissue under the waist.

Descriptions

Worker (Figure 77): Minute (HL 0.48–0.49 mm, HW 0.40–0.42 mm, SL 0.20–0.21 mm, EL 0.02–0.03 mm, MeSL 0.48–0.51 mm) (n=5) (MEM specimens). Entire body reddish-brown. Head wedge-shaped, widest near posterior margin, anterior edge (including clypeus) abruptly truncate; deep antennal scrobes present on sides of head; in full face view, entire head, except clypeus, with tightly woven reticulation; clypeus mostly lacking sculpture, shining; a single spatulate erect seta present on each posterior corner of head; otherwise all setae present on head simple, appressed; eyes reduced, with four to six facets, located about midway on sides of head near ventral edge (in lateral view) and along bottom edge of antennal scrobe; mandibles triangular, sharply depressed basally, forming a transverse edge that parallels the anterior clypeal edge, diastema lacking; serially dentate with seven sharply triangular teeth followed by four small denticles and terminating in slightly enlarged apical tooth; antenna six-segmented, scape short, dorsoventrally flattened with leading edge flange-like, leading edge of scape with a row of large spatulate hairs, one or more of which are curved toward the base of the scape, apical flagellomere greatly enlarged forming a two-segmented club with flagellomere three. Mesosoma shiny, with some light reticulate sculpture present on pronotum and promesonotal suture; scattered short, simple, appressed setae present dorsally. Pronotum with sharp lateral edge; lacking a median longitudinal carina. Propodeum with broad lamella, which mostly conceals propodeal teeth. Waist two-segmented, spongiform tissue heavily developed on both waist segments; petiole distinctly pedunculate, in dorsal view, node circular, shiny, with a few scattered simple, appressed setae; postpetiole ovoid, about twice as wide as petiole (in dorsal view), shiny, with a few simple, appressed setae; Gaster very shiny, lacking sculpture except for longitudinal carinae present dorsally at anterior edge of first gastral tergite; scattered, simple, appressed setae present; a few elongate, erect, clavate setae present apically; sting present.

Queen (Figure 78): Minute, slightly larger than worker (HL 0.51–0.53 mm, HW 0.44–0.46 mm, SL 0.24–0.25 mm, EL 0.08–0.09 mm, MeSL 0.58–0.60 mm) (n=5) (MEM specimens). Entire body reddish-brown. Head wedge-shaped, widest near posterior margin, anterior edge (including clypeus) abruptly truncate; deep antennal scrobes present on sides of head; in

full face view, entire head, except clypeus, with tightly woven reticulation; clypeus mostly lacking sculpture, shining; a single spatulate erect seta present on each posterior corner of head; otherwise all setae present on head simple, appressed. Eyes are well developed located on the ventral side of the antennal scrobe; three ocelli often with black coloration around them. Mandibles triangular, with distinct dentition all along their inner face (dentition as in worker); distinct, transverse edge at the base of the mandibles parallel to the anterior clypeal margin. Antenna six-segmented; scape short, dorsoventrally flattened, the dorsum and venter converging anteriorly so that the leading edge is a sharp flange or even a thin lamella; leading edge of scape with a row of large spatulate hairs, one or more of which are curved toward the base of the scape; pedicel about as long as funicular flagellomere two to three and about as long as flagellomere three; apical flagellomere greatly enlarge, forming a two-segmented club with flagellomere three. Mesosoma enlarged, mesoscutellum overhangs propodeum; pronotum, mesoscutum, mesoscutellum, anepisternum, and upper metapleuron with reticulate sculpture; katepisternum and lower metapleuron lacking sculpture, shiny; a pair of feebly clavate setae present near humeral area; with scattered to moderate short, simple, appressed setae present dorsally. Propodeum with broad lamella, which mostly conceals propodeal teeth. Wings, if present, lacking pigmented veins, stigma absent, with fringe of setae along wing edges apically and on ventral sides of wings to about midway toward base. Petiole distinctly pedunculate, in dorsal view, node circular, shiny, with a few scattered simple, appressed setae; in dorsal view, postpetiole about twice as wide as petiole, oval, shiny, with a few simple, appressed setae; spongiform tissue heavily developed on both waist segments. Gaster very shiny, lacking sculpture except for longitudinal carinae present dorsally at anterior edge of first gastral tergite; scattered, simple, appressed setae present; a few elongate, erect, clavate setae present apically; sting present.

Male: Not known.

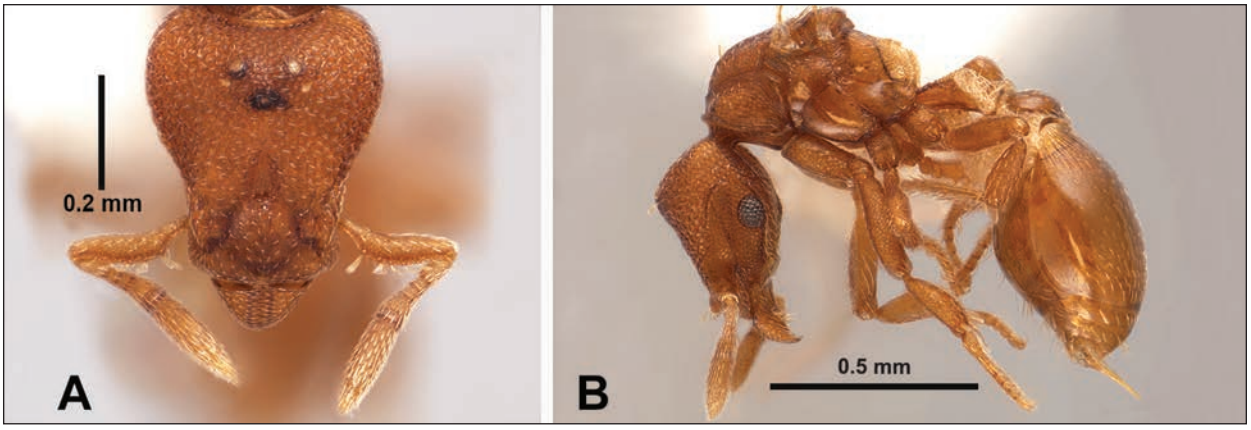


Figure 78. *Strumigenys membranifera* dealate queen (A) full face view and (B) lateral view.

Biology

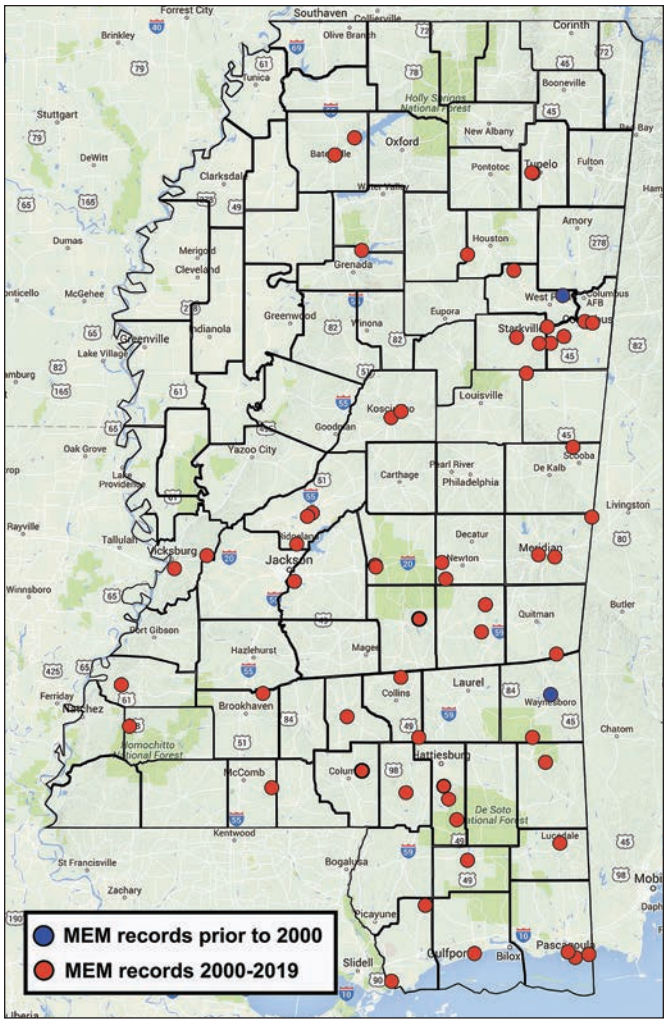
Outdoor populations of *S. membranifera* can be found in the South, where the temperatures are warmer and most likely closer to those in their native range. They are predators that will consume a large variety of invertebrates and have been well documented preying on collembola (Wilson 1954). Habitat requirements *for S. membranifera* have been found to be variable from litter on forest floors to open pastureland. Adaptability in colony formation is probably one of the reasons for its widespread range.

Pest Status

It is not considered to be a pest or a nuisance since it is rarely encountered by the average person. Its effects, if any, on other native *Strumigenys* species in the region have not been studied.

Distribution

This species is native to the Old World Tropics, but as a result of human commerce, it has a pantropical distribution (Wetterer 2011). In addition, it is the only nonnative *Strumigenys* species that can be found outdoors in Europe. In the U.S., it has been reported from Alabama, Arkansas, Arizona, California, Florida, Georgia, Hawaii, Louisiana, Mississippi, North Carolina, South Carolina, and Texas (AntWeb.org and MEM records). MEM county records from Mississippi include Attala, Clarke, Clay, Covington, Forrest, Franklin, George, Greene, Hancock, Harrison, Hinds, Jackson, Jasper, Jefferson, Jefferson Davis, Kemper, Lamar, Lauderdale, Lee, Lincoln, Lowndes, Madison, Marion, Newton, Noxubee, Oktibbeha, Panola, Pearl River, Perry, Pike, Scott, Smith, Stone, Warren, Wayne, Wilkinson, and Yalobusha (Map 26).



Map 26. *Strumigenys membranifera* site records in Mississippi based on MEM specimens.

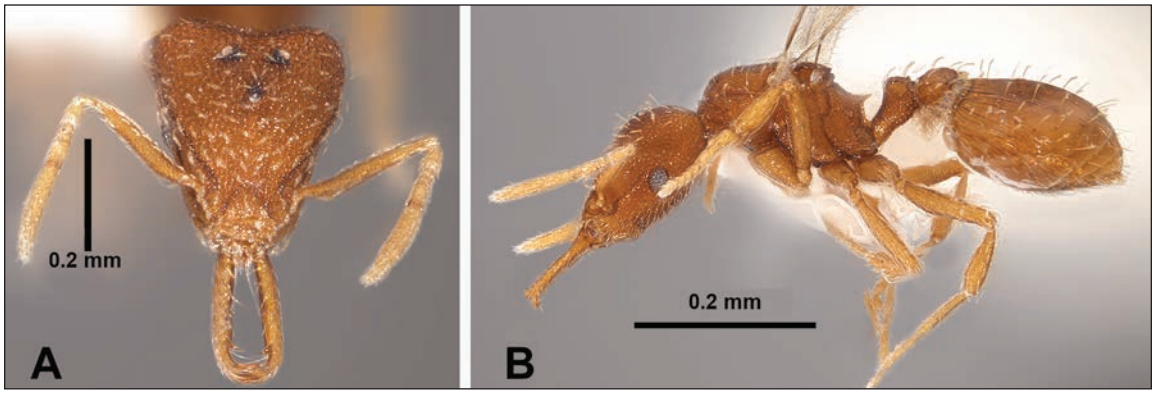


Figure 79. ***Strumigenys silvestrii*** **worker (A) full face view and (B) lateral view.**

Summary

Strumigenys silvestrii Emery (Myrmicinae) is a tiny predatory ant species native to South America (MacGown et al. 2012). In recent years, this species has become established in the U.S., especially in the Southeast, where it has been collected in a variety of habitats. *Strumigenys silvestrii* workers and queens possess extremely elongate mandibles and antennae.

Diagnosis

Strumigenys silvestrii workers can be recognized by their minute size, reddish-brown color, narrowed heart-shaped head, elongate six-segmented antennae terminating in a two-segmented club, elongate mandibles with three apical teeth and often with a small denticle on the inside of each mandible about midway, and petiole lacking a spongiform curtain. In the U.S., this species is most similar to the native *S. louisianae,* from which it differs by being smaller, having a narrower head, and often having a denticle near the middle of the inner margin of the mandible.

Descriptions

Worker (Figure 79): Minute (HL 0.44–0.46 mm, HW 0.34–0.36 mm, SL 0.30–0.32 mm, EL 0.02–0.03 mm, MeSL 0.44–0.47 mm) (n=5) (MEM specimens). Entire body reddish-brown. Head heart-shaped, elongate, widest posteriorly, deeply concave along posterior border; antennal scrobes present on lateral sides of head; entire head with tightly woven foveolate reticulation; clavate scale-like setae numerous on face and margin of head, all setae directed anteriorly; eyes small with only a few facets, located laterally below the antennae; mandibles narrowed and elongate, approximately half the length of the head, with three distinct apical teeth and with a small denticle located along the inner margin of the mandible at about the midpoint; antennae six-segmented, scape nearly reaching occipital border, most of the setae along the inner margin of the scape directed toward scape apex except for at least two setae directed toward scape base, apical flagellomere greatly enlarged, and subequal in length to scape. Mesosoma with dense, tightly woven foveolate reticulate sculpture; scattered erect, scale-like setae present dorsally; dorsal surface of mesosoma forming a continuous low arc in lateral view; promesonotal suture forming a distinct carinae; propodeum with small triangular spines. Waist two-segmented, with scattered erect, clavate setae directed posteriorly; petiole with tightly woven foveolate sculpture, peduncle thickened in lateral view, spongiform tissue lacking ventrally, node somewhat rectangular in dorsal view; postpetiole shiny, with spongiform tissue present ventrally and posteriorly, in dorsal view node kidney bean shaped and about twice as wide as petiole. Gaster smooth, shiny, with longitudinal grooves present on anterior portion of first tergite; scattered erect, clavate setae present; sting present.

Queen (Figure 80): Minute (HL 0.48 mm, HW 0.38 mm, SL 0.30 mm, EL 0.07 mm, MeSL 0.52 mm) (n=1) (MEM specimen). Brown ant, slightly darker than the workers and slightly longer. Entire body reddish-brown. Head heart-shaped, elongate, widest posteriorly, deeply concave along posterior border; antennal scrobes present on lateral sides of head; entire head with tightly woven foveolate reticulation; clavate scale-like setae numerous on face and margin of head, all setae directed anteriorly; eyes large, located on the ventral side of the antennal scrobe; three ocelli present, often with black coloration

around them; mandibles elongate, approximately half the length of the head, with a distinct apical fork followed by a single tooth, with a small denticle located along the inner margin of the mandible at about the midpoint; antennae six-segmented, scape nearly reaching occipital border, most of the setae along the inner margin of the scape directed toward scape apex except for at least two setae directed toward scape base, apical flagellomere greatly enlarged, and subequal in length to scape. Mesosoma squarish in lateral view, densely foveolate with the meso- and metapleural region smooth; scattered erect, scale-like setae present dorsally; propodeum with two posteriorly directed triangular teeth present. Wings, if present, lacking pigmented veins, stigma absent, with fringe of setae along wing edges apically and on ventral sides of wings to about midway toward base. Waist two-segmented, with scattered erect, clavate setae directed posteriorly; petiole with tightly woven foveolate sculpture, peduncle thickened in lateral view, spongiform tissue lacking ventrally, node somewhat rectangular in dorsal view; postpetiole shiny, with spongiform tissue present ventrally and posteriorly, in dorsal view node kidney bean shaped and about twice as wide as petiole. Gaster smooth, shiny, with longitudinal grooves present on anterior portion of first tergite; scattered erect, clavate setae present; sting present.

Male: Not known.

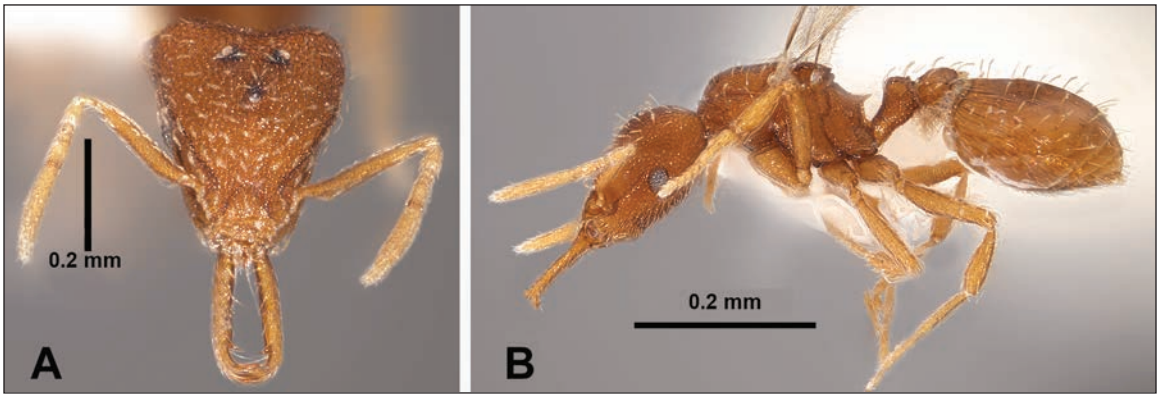


Figure 80. *Strumigenys silvestrii* alate queen (A) full face view and (B) lateral view.

Biology

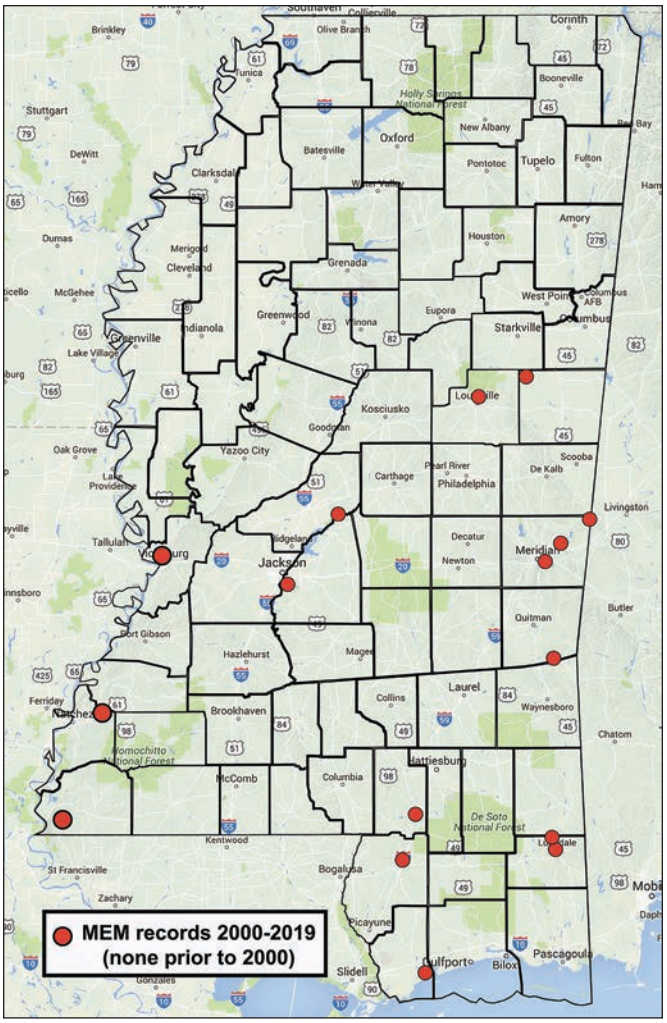
In Mississippi, *Strumigenys silvestrii* has been found in leaf litter in coastal hardwood forests, bottomland hardwood forests, the Black Belt Prairie, upland hardwood forests, dune scrub, cedar hardwood forests, sandy roadsides, hardwood forests, grassy areas, and vacant urban lots (MEM data). Ants in this genus tend to be slow-moving and very cryptic, often halting all movement when disturbed, as well as rarely venturing into the open. *Strumigenys silvestrii* most likely feeds on Collembola and other small soil arthropods with their trap-jaw mandibles, like other species in this genus with similar mandibles.

Pest Status

It is not considered to be a pest or a nuisance and is rarely encountered by the average person. Its effect, if any, on other native *Strumigenys* species in the region has not been studied.

Distribution

Strumigenys silvestrii is native to South America. In the U.S., it has been reported from Alabama, California, Florida, Georgia, Louisiana, Mississippi, and Texas (AntWiki.org and MEM records). MEM county records from Mississippi include Clarke, George, Hancock, Hinds, Jefferson, Lamar, Lauderdale, Madison, Noxubee, Pearl River, Scott, Warren, Wilkinson, and Winston (Map 27).



Map 27. *Strumigenys silvestrii* site records in Mississippi based on MEM specimens.

Figure 81. *Tapinoma melanocephalum* worker (A) full face view and (B) lateral view.

Summary

Tapinoma melanocephalum (Fabricius) (Formicinae) is an exotic tramp species thought to have originated in either the Afro-tropical or Oriental regions (Smith, 1965). The ghost ant is considered to be a nuisance species that invades houses and businesses, where it may nest and invade food stores.

Diagnosis

Ghost ant workers can be easily identified by their extremely small size (TL 1.3–1.5 mm) and coloration: bicolored with the head and mesosoma dark brown to blackish-brown and the appendages, petiole, and gaster milky white. They have 12-segmented antennae, lack spines, lack a sting, lack large erect hairs on the body, and lack a protruding node on the petiole. The petiole is often hidden by the gaster, which may overlap it. These minute ants are difficult to detect because of their size and partial light coloration.

Descriptions

Worker (Figure 81): Minute (HL 0.43–0.47 mm, HW 0.39–0.40 mm, SL 0.40–0.44, EL 0.11–0.12 mm MeSL 0.46–0.50 mm) (n=5) (MEM specimens). Bicolored with the head and mesosoma dark brown to blackish-brown and the mandibles, antennae, legs, and gaster a pale yellowish-white. Head roughly rectangular with fine, dense pubescence and a few erect setae on the clypeus; eyes located on the anterior half of the head; antennae are 12-segmented without a distinct club; scape extends beyond the posterior border of head; mandibles with three to four large teeth at the apex followed by minute dentition; long labial palps. Mesosoma with dense pubescence; dorsal surface divided into three sections by two distinct sutures; lacking any distinct sculpturing. Waist one-segmented, without a distinct node; often hidden by the overhanging gaster. Gaster with dense pubescence and a few erect setae on the fourth tergite; in the dorsal view four tergites are visible; sting lacking.

Queen (Figure 80): Small, about twice the size of worker (HL 0.56 mm, HW 0.53 mm, SL 0.50 mm, EL 0.19 mm, MeSL 0.83 mm) (n=1) (MEM specimen). Less distinctly bicolored than the worker with a brown head, light- to pale-brown mesosoma, and brown gaster with pale stripes at the posterior ends of the tergites. The mandibles, antennae and legs are all pale. Head with dense pubescence with a few erect setae on the clypeus; eyes situated slightly in front of the midline of the head; smaller ocelli present; conspicuous labial palps; 12-segmented antennae without a distinct club; scapes just reaching or exceeding the occipital border. Mesosoma with dense pubescence; elongated with the dorsal surface of the mesonotum flat; four wings or wing scars present. Waist is one-segmented without an obvious node; often hidden by the overhanging gaster. Gaster with dense pubescence and erect setae present on the last tergite; only four tergites visible in the dorsal view.

Male: Specimens not available for study.

Biology

Tapinoma melanocephalum is opportunistic nester that may utilize almost any cavity of sufficient size to house a colony. Nests may be found in disturbed areas, in plant pots, under objects on the ground, under bark, at the bases of palm fronds, or other similar situations

(Nickerson et al. 2010, MEM data). Colony size ranges from small to large and are often polygynous (Smith 1965). Relocation of colonies from one site to another is not uncommon. New colonies may form when a queen and some workers leave a colony for a new suitable nesting site. Mating flights for this species have not been observed (Smith 1965). *Tapinoma melanocephalum* is attracted to sugars and has been observed to tend honeydew-producing insects, as well as to feed on dead and live insects (Smith 1965).

Pest Status

Even though *T. melanocephalum* does not have a painful bite or sting, it is considered to be a nuisance pest. *Tapinoma melanocephalum*'s ability to form colonies in any suitable crevice has led to them being a common house-infesting ant. It has been reported to form colonies in wall voids in buildings and in potted plants (Nickerson and Bloomcamp 2010). Fowler et al. (1993) and Moreira et al. (2005) reported that *T. melanocephalum* was the most common ant found in Brazilian hospitals with Moreira et al. (2005) finding at least 14 different types on bacteria on this species. *Tapinoma melanocephalum* was reported by Smith (1965) to forage indoors for sweets and other household foods. Longino (2006) reported that "whether you are in Guinea, New Guinea, or Guyana, if you are sitting at a table with a sugar dispenser you are likely to see workers of *T. melanocephalum* running about on the surface."

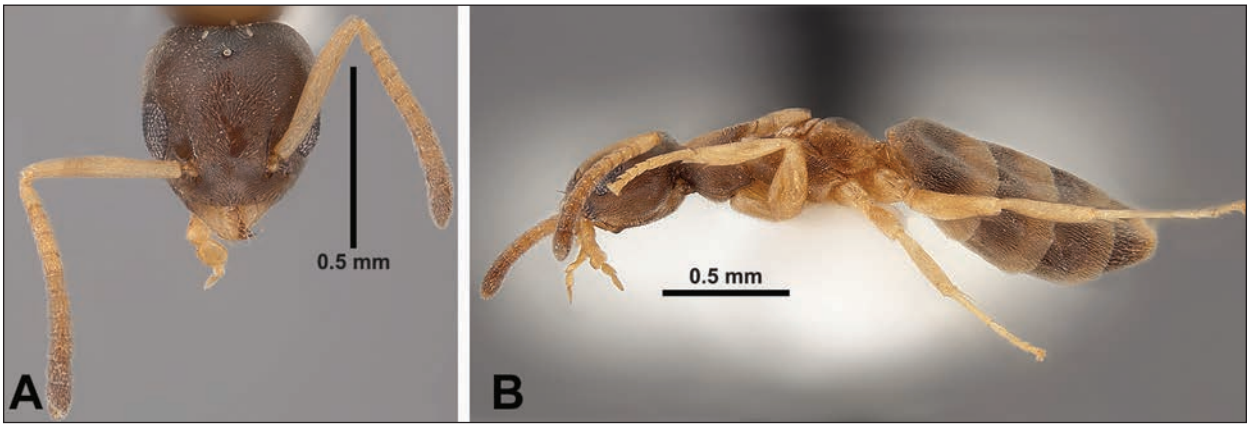
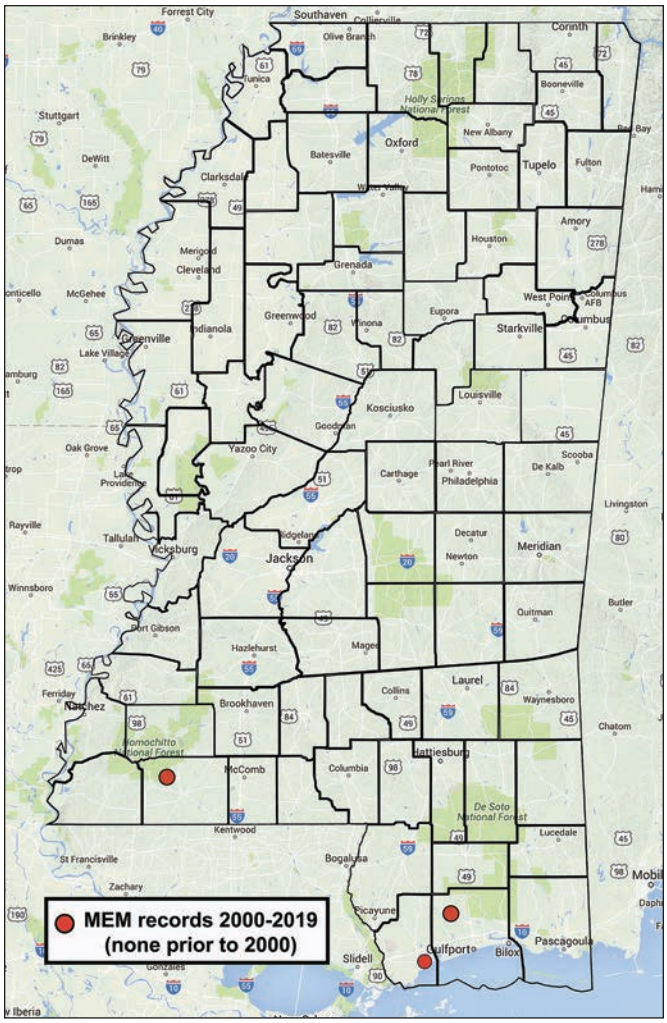


Figure 82. *Tapinoma melanocephalum* dealate queen (A) full face view and (B) lateral view.

Distribution

The native origin of *T. melanocephalum* is uncertain, though M. R. Smith (1965) suggested that it was likely native to Africa or Asia. Due to its spread by commerce, it is now widespread in subtropical and tropical regions throughout the world. In the U.S., this species has been reported from Alabama, Arizona, California, Connecticut, Florida, Georgia, Hawaii, Iowa, Kansas, Illinois, Louisiana, Maine, Michigan, Minnesota, Mississippi, Missouri, North Carolina, New Mexico, New York, Ohio, Oregon, Pennsylvania, South Carolina, Texas, Virginia, Washington, Wisconsin, and Washington D.C. (MEM, antweb.org, antwiki.org, Wetterer 2009) (records from Northern states are likely from indoor populations). Established outdoor populations in the U.S. are only known from Florida, Hawaii, southern Texas, southern Alabama, and southern Mississippi. This species was first reported from Mississippi from Hancock County in 2009 (MacGown and Hill 2009). MEM staff later found populations in Amite and Harrison Counties (Map 28).



Map 28. *Tapinoma melanocephalum* site records in Mississippi based on MEM specimens.

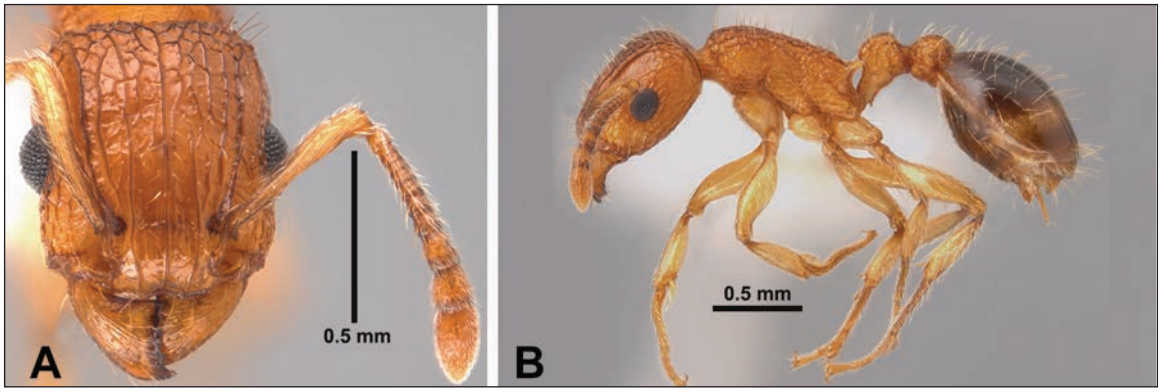


Figure 83. ***Tetramorium bicarinatum*** **worker (A) full face view and (B) lateral view.**

Summary

Tetramorium bicarinatum (Nylander) (Myrmicinae), the bicolored pavement ant, is distributed worldwide in tropical and subtropical climates (except for the Afrotropical regions) and has been found in heated buildings in more temperate areas (Hita Garcia and Fisher 2011). This species is thought to be native to Southeast Asia (Bolton 1980). Historically, this species was misidentified as *T. guineense* (Fabricius, 1793).

Diagnosis

Tetramorium bicarinatum can be separated from other *Tetramorium* species in the Southeast by its small size (TL ≈ 3.5–4.0 mm), relatively flat mesosoma, the medial indentation of the clypeus, its bicoloration, and strong rugoreticulation on head, mesosoma, and waist.

Descriptions

Worker (Figure 83): Small (HL 0.90–0.97 mm, HW 0.77–0.81 mm, SL 0.60–0.64 mm, EL 0.21–0.23 mm, MeSL 0.97–1.01 mm) (n=5) (MEM specimens). Head, mesosoma, and waist orange to orangish-brown; legs lighter, yellowish-brown; and gaster dark brown. Head rounded rectangular, strongly shining, with strong, medial, longitudinal rugae extending from clypeus towards the posterior border, strong rugoreticulation present on posterior region of head (in full face view) and on sides of head; numerous erect setae present; eyes distinctly convex, located along the midline of the head; antennae 12-segmented with a three-segmented club; scape fits against head along a longitudinal ridge running from the posterior end of the clypeus to the posterior border of the head; anterior clypeal margin distinctly notched or indented; lateral portions of clypeus forming a sharp wall anterior to antennal insertion point; mandibles triangular with six teeth along the inner margin. Mesosoma: dorsal outline relatively flat and continuous in lateral view; shiny, with strong rugoreticulation present except on mesopleuron and metapleuron, which has transverse rugae; erect setae present on dorsal surface; propodeal spines elongate, narrowly triangular, pointed slightly rearward; a shorter, pair of triangular projections arising at ventroposterior region of propodeum. Waist two-segmented with prominent nodes, both nodes with strong reticulation; with elongate, erect setae; petiolar node and postpetiolar node subequal in length; petiole squarish in lateral view, with a short tooth present anteroventrally, tooth directed slightly anteriorly; postpetiole circular in lateral view, wider than petiolar node in dorsal view. Gaster shining with numerous elongate, erect setae; first tergite makes up at least half of length; sting with a lamellate appendage found apicodorsally that projects at an angle to the long axis of the sting shaft.

Queen (Figure 84): Slightly larger than worker (HL 1.07–1.12 mm, HW 0.92–0.95 mm, SL 0.66–0.69 mm, EL 0.28–0.30 mm, MeSL 1.45–1.51 mm) (n=5) (MEM specimens). Head, mesosoma, and waist orange reddish-brown; legs light, orangish-brown; and gaster dark brown. Head rounded rectangular, but widest posteriorly; strongly shining, with medial, longitudinal rugae extending from clypeus towards the posterior border, strong rugoreticulation present on posterior region of head (in full face view) and on sides of head; numerous erect setae present; eyes well developed, located along the midline of the head; three whitish colored ocelli

present; lateral portions of clypeus forming a sharp wall anterior to antennal insertion point; antennae 12-segmented with a three-segmented club; scape fits against head along a longitudinal ridge running from the posterior side of the clypeus to the posterior border of the head; clypeus notched or indented along the anterior border; mandibles triangular. Mesosoma elongate, rounded rectangular, shiny; pronotum and propodeum with strong rugoreticulation; mesoscutellum and mesoscutum with longitudinal rugae; anepisternum with transverse rugae, katepisternum mostly lacking sculpture except at edges; numerous simple, erect setae present on mesosomal dorsum; dorsal surface flat with a distinct notch at the propodeal suture; propodeal spines bidentate with the length of each dorsal spine about twice the length of the each ventral spine; mesosoma enlarged with four wings or wing scars. Wings hyaline, with typical myrmicine venation; forewing with pale stigma, closed elongate costal cell, basal cell, marginal cell, submarginal cell, discal cell, and subbasal cell; medial vein almost reaches wing tip; hindwing lacking jugal lobe and with costal, basal, and subbasal cells closed. Waist two-segmented, both nodes with strong reticulation; conspicuous, posteriorly directed, erect setae present; petiolar node and postpetiolar node subequal in length: petiole with a short tooth present anteroventrally, tooth directed slightly anteriorly. Gaster shining with conspicuous, erect setae; first tergite makes up at least half of length; sting present and with a lamellate appendage found apicodorsally that projects at an angle to the long axis of the sting shaft.

Male: Small (based on antweb.org photos). Head fading from yellowish-brown anteriorly to brown posteriorly; mesosoma, waist, and gaster brown with lighter yellowish-brown coloration at posterior edges of gastral segments; antennae and legs pale yellow-brown. Head somewhat circular in full face view, longitudinal rugae present medially, extending from anterior portion of clypeus to base of lower ocellus, remainder of head with strong, deep, rugoreticulation, with fine punctulation present in spaces formed between; numerous erect setae present of various lengths, most of the setae on posterior border longer than those on the face; eyes large, about half the length of the head; three large, whitish ocelli present, slightly raised; mandibles triangular with elongate apical tooth followed by four smaller teeth; anterior clypeal border relatively straight; antennae 10-segmented; scape and second funicular segment subequal in length. Mesosoma ovoid in lateral view, slightly matte in appearance; mesoscutum, mesoscutellum, pronotum, and mesopleura lacking sculpture except for transverse striae in sulcus; propodeum with loose, well-defined rugoreticulation and transverse rugae at edges; scattered semierect setae present, especially dorsally; mesoscutum enlarged, smoothly curved and overhanging propodeum; wings transparent; with similar venation to female, except pterostigma in forewing mostly transparent; propodeum rounded posteriorly, spines lacking. Waist two-segmented, with loose rugoreticulation present and scattered, posteriorly directed, erect setae; petiole elongate, longer than postpetiole, with a small, sharp subpetiolar process present anteroventrally, directed anteriorly; postpetiole somewhat circular in dorsal view. Gaster lacking obvious sculpture, with conspicuous, erect setae directed posteriorly; first tergite darker than the remaining ones; genitalia visible at the apex, in side view parameres triangular, rounded apically.

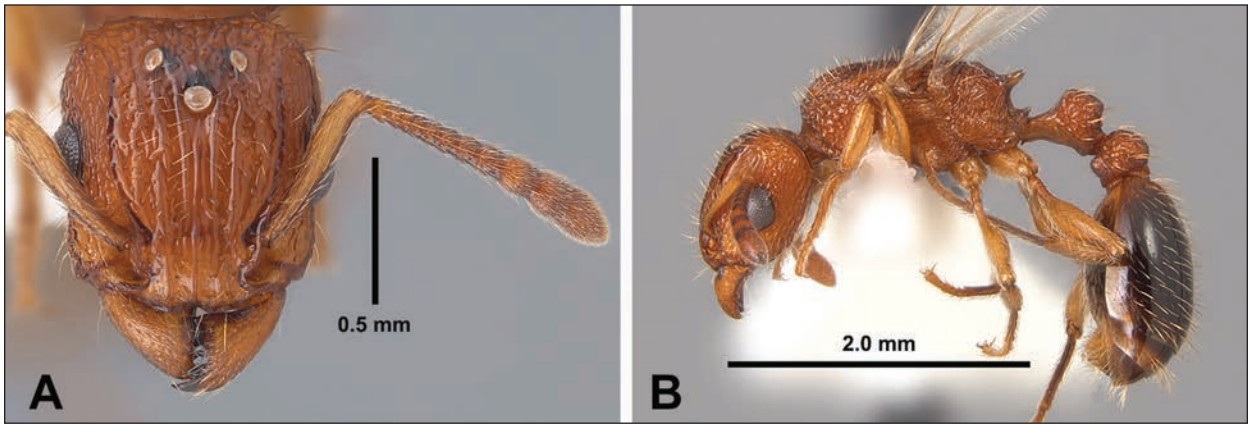


Figure 84. *Tetramorium bicarinatum* alate queen (A) full face view and (B) lateral view.

Biology

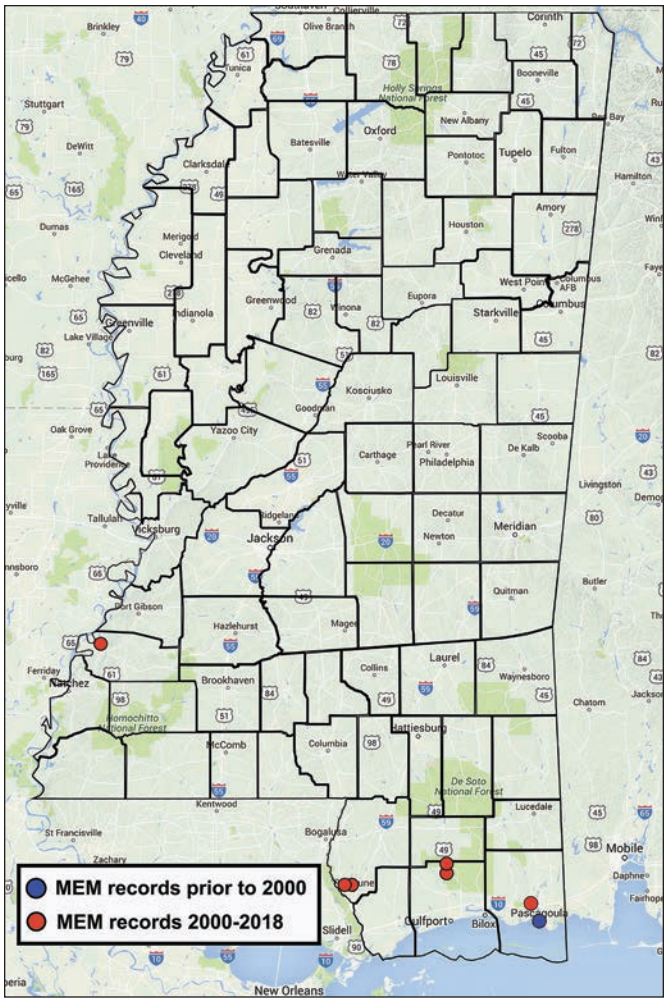
Tetramorium bicarinatum has been reported to form colonies under rocks, under tree bark, in exposed soil, in rotting logs, in hollow stems, and in other objects found on the ground. In Mississippi, the MEM has collected this species nesting in palmettos and foraging and nesting at plant nurseries in coastal counties. Colonies found by MEM personnel in Mississippi were relatively small (workers numbered in the hundreds or less). This omnivorous species feeds on dead and live insects, honeydew produced from various homopterans, and various other food sources (Smith 1965).

Pest Status

Although *Tetramorium bicarinatum* occasionally enters and/or nests in building and houses, it is not considered to be an economically important pest species. In homes, this omnivorous species has been reported to feed on grease, meats, sugary foods, and plant-based foods (Smith 1965). *Tetramorium bicarinatum* is capable of stinging but has not been reported to be aggressive and is not considered a serious stinging pest.

Distribution

Tetramorium bicarinatum is thought to be native to Southeast Asia but is widely distributed in equatorial regions throughout the world, except in tropical regions of Africa (Bolton 1977, 1979, 1980). In the U.S., *T. bicarinatum* has been reported from Alabama, Arkansas, California, Florida, Georgia, Hawaii, Illinois, Louisiana, Mississippi, Missouri, North Carolina, South Carolina, and Texas (AntWeb.org and MEM). Occasionally, this species has been found in northern states in heated buildings, especially greenhouses, where the artificially stable temperatures are closer to their preferred temperature range. MEM county records for this species include Attala, Hancock, Harrison, Jackson, Jefferson, and Pearl River (Map 29).



Map 29. *Tetramorium bicarinatum* site records in Mississippi based on MEM specimens.

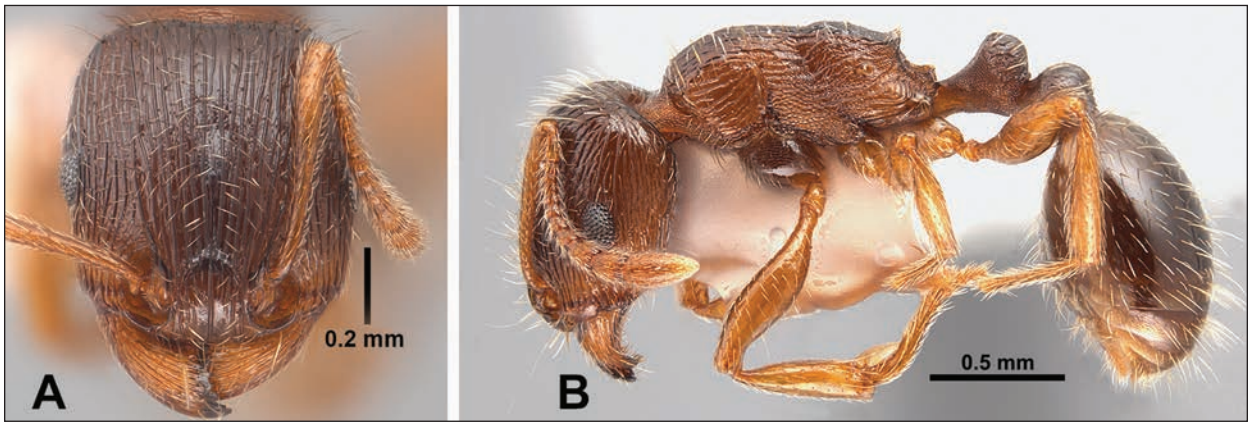


Figure 85. ***Tetramorium immigrans*** **worker (A) full face view and (B) lateral view.**

Summary

Tetramorium immigrans Santschi (Myrmicinae) is a small (TL ≈ 4.0 mm), brown species that is now widely distributed in the U.S., especially in Northern states (Antamps.org). In Mississippi, this species has only been collected in Oktibbeha County (MEM record).

Taxonomic Status

In most literature, *T. immigrans* has been identified as *Tetramorium caespitum* (Linnaeus, 1758), or in recent years, *Tetramorium* sp. E (Schlick-Steiner et al. 2006). In a recent paper on the *T. caespitum* complex, Wagner et al. (2017) clarified the confusion about the name by raising the subspecies *T. caespitum immigrans* Santschi to species level.

Diagnosis

Tetramorium immigrans can be separated from other *Tetramorium* species in the Southeast by its overall brownish-red color, strong rugae present on the head and mesosoma, and abundant erect setae on the entire body. A morphologically similar species, *T. tsushimae* Emery, native to Japan, is now established in parts of Missouri and Illinois (Steiner et al. 2006). This species differs from *T. immigrans* by being smaller.

Descriptions

Worker (Figure 85): Small (HL 0.95–0.99 mm, HW 0.86–0.92 mm, SL 0.71–0.75 mm, EL 0.18–0.21 mm, MeSL 1.00–1.09 mm) (n=5) (MEM specimens). Overall reddish-brown with the legs and antennae lighter than the body. Head slightly longer than wide, rounded rectangular, shiny, with longitudinal rugae from the anterior edge of the clypeus to the posterior margin; entire head with numerous erect setae; eyes located laterally at the midline of the head; antennae 12-segmented with a three-segmented club; posterior margin of clypeus raised into a sharp ridge anterior to the antennal insertion point; mandibles triangular, with deep longitudinal striae. Mesosoma shiny with deep, longitudinal rugae present, except on katepisternum, which is punctulate; numerous, erect setae present, especially dorsally; promesonotum forming a smooth, continuous arc, mesonotal suture distinct; propodeum with a pair of triangular, slightly upturned spines present posterodorsally and a pair of reduced triangular projections posteroventrally. Waist two-segmented, sides punctate, with loose reticulation on dorsum of nodes, with scattered coarse, setae on dorsal surface; petiole petiolate, node squarish in lateral view, postpetiolar node circular in lateral view, wider than petiolar node in dorsal view, laterally punctate. Gaster shining and smooth; with numerous erect setae; first tergite makes up at least half of length; sting with a lamellate appendage found apicodorsally that projects at an angle to the long axis of the sting shaft.

Queen (Figure 86): (No MEM specimens, based on antwiki.org pictures of one specimen). Small, slightly larger than worker Overall dark brown, antennae and legs reddish-brown. Head about as wide as long, widest posteriorly; with longitudinal rugae from the anterior edge of the clypeus to the posterior margin; entire head with numerous erect, stiff, setae; eyes located laterally at the midline of the head; three small ocelli present; antennae 12-segmented with a three-segmented club; posterior margin of clypeus raised into a sharp ridge

anterior to the antennal insertion point; mandibles triangular, with deep longitudinal striae. Mesosoma enlarged, subrectangular in lateral view, dorsum flattened; mesosoma mostly matte except mesoscutum and mesoscutellum, which are slightly shiny; pronotum, anepisternum, posterior region of katepisternum, and sides of propodeum with striae present; mesoscutum with striae limited to posterior region; numerous, erect setae present, especially dorsally; propodeum with a pair of short, blunt-tipped spines; propodeal lobes not spine-like. Waist two-segmented, sides and dorsum with transverse striae, with loose reticulation on dorsum of nodes; scattered coarse, setae on dorsal surface; petiolar node triangular in lateral view, with a squarish anterior subpetiolar process; postpetiole somewhat elliptical in lateral and dorsal view, more than 1.5 times as wide as petiole in dorsal view. Gaster shining and smooth; first tergite makes up about half of length of gaster; numerous erect setae present on first tergite and sternite, setae limited to posterior edges of remaining sternites and tergites; sting with a lamellate appendage found apicodorsally that projects at an angle to the long axis of the sting shaft.

Male: Small (No MEM specimens, based on antwiki.org pictures of one specimen). Overall dark brown to black with antennae and legs lighter in color. Head with hair-like setae on the posterior border and conspicuous setae on the mandibles; eyes large and located laterally along the midline of the head; three ocelli present; antennae 10-segmented; first funicular segment much shorter than the second; sculpturing is subreticulate. Mesosoma with hair-like setae along the dorsal surface; four wings present; mesonotal segment enlarged; weak longitudinal striations. Waist is two-segmented; sparse, erect setae present; petiole and post petiole nodes relatively low; postpetiolar node about twice the width of the petiolar node. Gaster is smooth and shining with short, hair-like setae located near the posterior border of each tergite; genitalia present at the apex.

Biology

Tetramorium immigrans forms colonies under stones, in logs, in buildings, and under litter and other objects on the ground. In some areas, *T. immigrans* (reported as *T. caespitum*) is the most common house-dwelling ant (Smith 1965). *Tetramorium immigrans*, also known as the pavement ant, can be found commonly in cities and urban areas in Europe and North America. They can be found forming large aggregations on sidewalks in urban areas (MEM observations). *T. immigrans* will feed on a variety of substances, including honeydew from homopteran insects, live and dead insects, and food found in homes, though they seem to prefer meats and grease (Smith 1965). Also, winged reproductive ants have been seen in every month of the year, but they seem to be most common in the warm summer months (Smith 1965).

Pest Status

Commonly found nesting in and near houses and gardens, *Tetramorium immigrans* is considered a pest species by some people. They have been known to feed

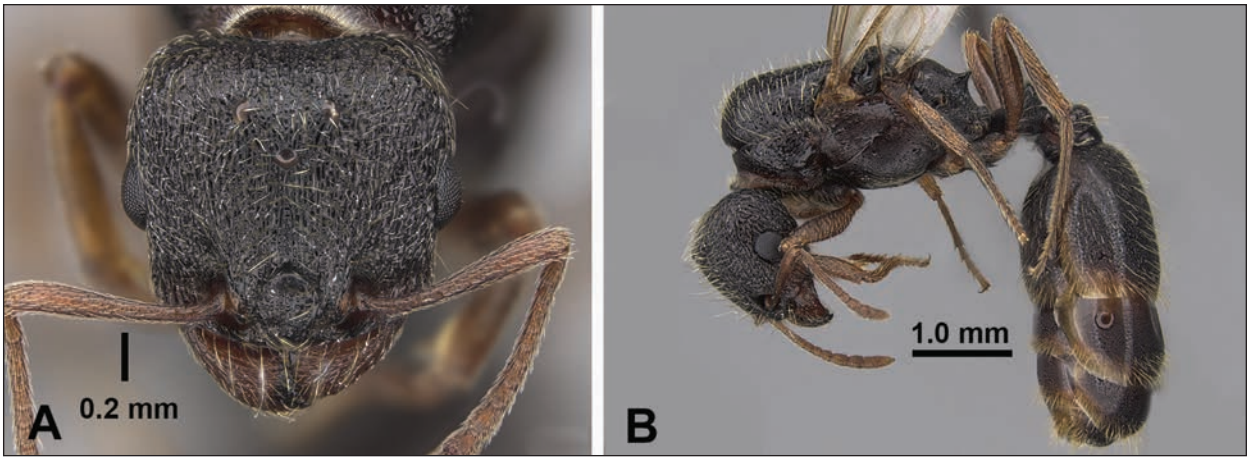
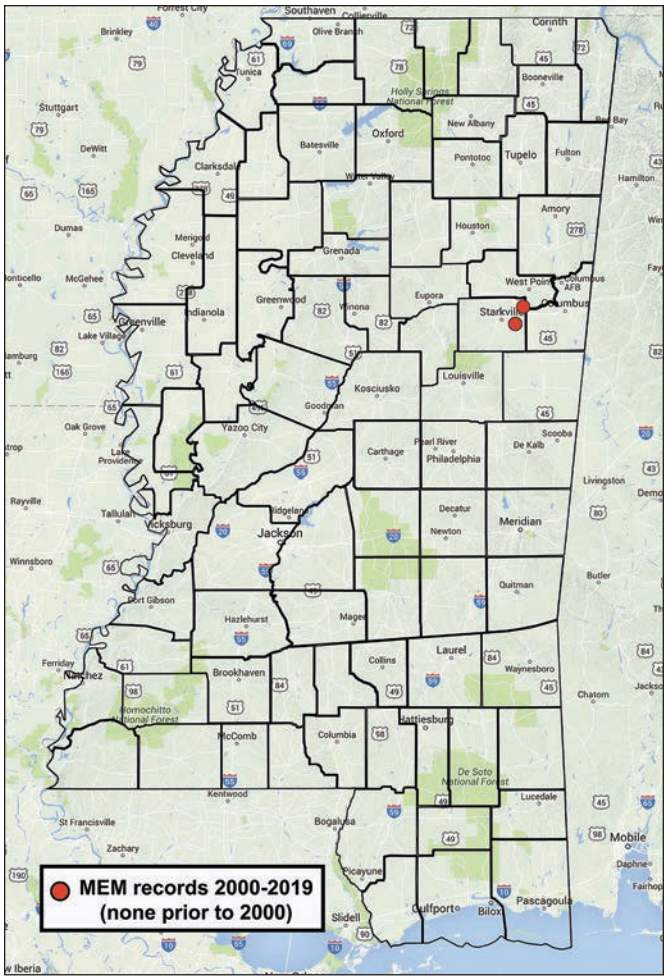


Figure 86. *Tetramorium immigrans* queen (A) full face view and (B) lateral view (from Antweb.org, photo by Wade Lee, Specimen: CASENT0845171).

on garden plants and observed to girdle and scar the roots, as well as forage upon seeds in seed beds (Smith 1965). Also, in areas where they are prolific, these ants can be the primary house pest, nesting and foraging in homes. *Tetramorium immigrans* has also been shown to be an intermediate host of the poultry tapeworms *Raillietina tetragona* (Molin) and *R. echinobothrida* (Megnin) (Smith 1965). They acquire the cestode parasite by consuming the eggs that were laid on plants. The eggs then will hatch and develop into cysticercoids inside the ant's body cavity, where they wait until the ants gets ingested by a chicken or other primary host. After being ingested, they reproduce in the chicken's gut (Junquera 2007–2016). *Tetramorium immigrans* has also been known to sting people and has been observed to cause allergic reactions in some people (Smith 1965).

Distribution

Tetramorium immigrans is thought to be native to Europe or South Asia (Wagner et al. 2017) and is widely distributed across Europe and the U.S. In the U.S., *T. immigrans* has been reported from Alabama, California, Colorado, Georgia, Illinois, Kentucky, Massachusetts, Maryland, Mississippi, Missouri, Nebraska, New Mexico, New Jersey, Nevada, Ohio, Oregon, Pennsylvania, North Carolina, New York, South Carolina, Tennessee, Utah, Virginia, Washington, West Virginia (antweb.org, antwiki.org and MEM). In Mississippi, the only MEM record of this species is from Oktibbeha County (Map 30).



Map 30. *Tetramorium immigrans* site records in Mississippi based on MEM specimens.

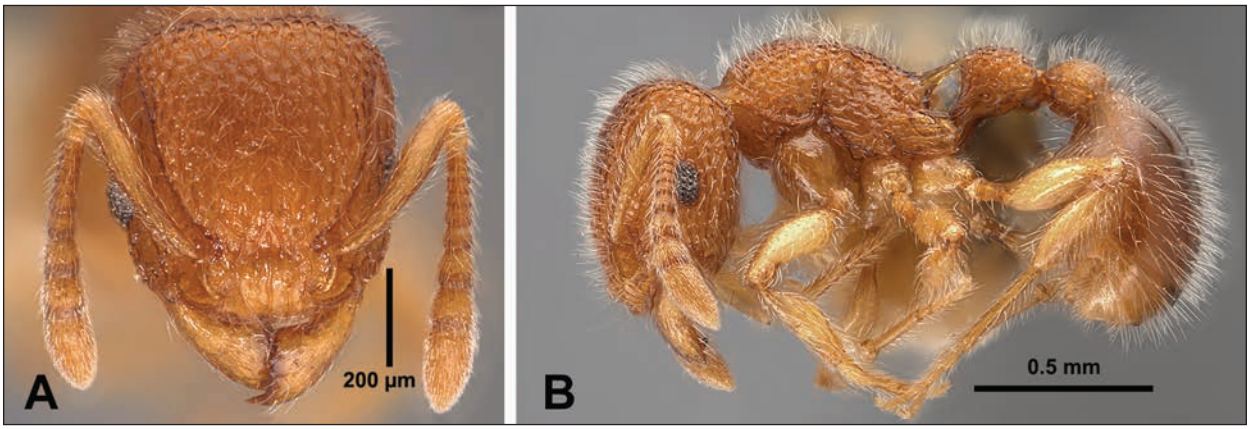


Figure 87. ***Tetramorium lanuginosum*** **worker (A) full face view and (B) lateral view.**

Summary

Tetramorium lanuginosum Mayr (Myrmicinae) is a small (TL ≈ 2.5–3.0 mm), reddish-brown setose ant native to tropical and subtropical Asia (Wetterer 2010d). This species has been collected only rarely in the continental U.S., and many of the records of it are historic.

Diagnosis

Tetramorium lanuginosum can be separated from other similar species in the Southeast by the dense covering of plumose setae present on the entire body; dense, rugoreticulation on the head, mesosoma, and waist; and the elongate, straight propodeal spines.

Descriptions

Worker (Figure 87): Small (HL 0.66–0.69 mm, HW 0.59–0.63 mm, SL 0.42–0.46 mm, EL 0.14–0.15 mm, MeSL 0.68-0.70) (n=5) (MEM specimens). Overall light reddish-brown to dark brown, gaster slightly darker, and legs yellowish-brown. Head squarish, slightly longer than wide; with tightly woven, deep rugoreticulation; entire head with dense short, erect, whitish plumose-like setae (setae with two or three branches); eyes small, located laterally near the midline of the head; frontal process widened over the antennal insertion; antennal scrobes present, curving from antennal bases to posterior corners of the head; antennae 12-segmented with a three-segmented club; apical segment of antennal club over half the length of club; posterior edge of clypeus forming an abrupt wall anterior to the antennal insertion point; mandibles triangular. Mesosoma smoothly arced in profile view; entire mesosoma with densely woven rugoreticulation; dense short, erect, whitish plumose-like setae abundant; propodeal spines straight, elongate; propodeal lobes small, triangular, acute; legs lacking sculpture, with numerous bifid setae. Waist two-segmented; with strong reticulate sculpture; with dense short, erect, whitish plumose-like setae especially dorsally; both petiolar node and postpetiolar node subcircular when viewed dorsally; petiole squarish in profile. Gaster, lacking sculpture, shiny; with numerous, simple and bifid setae; first tergite enlarged, more than half then length of gaster; sting with a lamellate appendage found apicodorsally that projects at an angle to the long axis of the sting shaft.

Queen (Figure 88): (No MEM specimens, based on antwiki.org pictures) Slightly larger than workers Color ranges from orangish-brown to brown with a slightly darker-colored gaster. Head slightly longer than wide; with deep, tightly woven rugoreticulation; dense short, erect, whitish plumose-like setae present; eyes located laterally near midline of the head; three ocelli present; antennae 12-segmented with a three-segmented club; posterior edge of clypeus forming an abrupt wall anterior to the antennal insertion point; mandibles triangular. Mesosoma enlarged, subquadrate, mesoscutum and mesoscutellum contiguous, flattened; dense rugoreticulation present on entire mesosoma except katepisternum, which is smooth, shining; dense short, erect, whitish plumose-like setae present, especially dorsally; propodeal spines elongate. Waist two-segmented; with dense reticulation; dense short, erect, whitish plumose-like setae present; both nodes subcircular. Gaster, lacking sculpture, shiny; with numerous, simple and bifid setae; first tergite enlarged, more than half the length of the gaster; sting with a lamellate appendage

found apicodorsally that projects at an angle to the long axis of the sting shaft.

Male: Unknown.

Biology

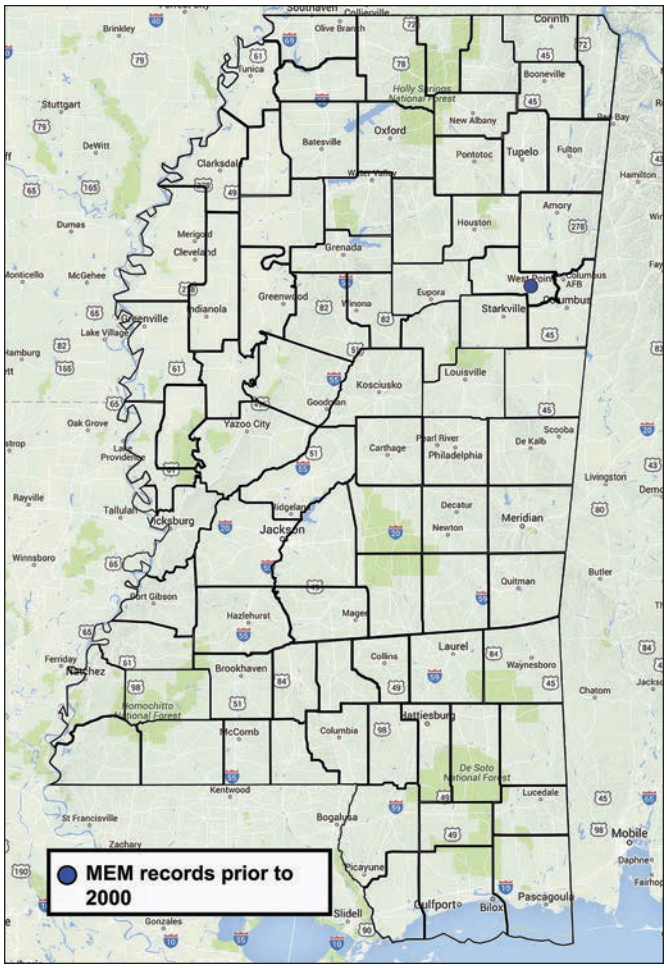
Colonies of this species have been found in leaf mold, in rotten wood, in soil at bases of palms, under stones, and under bark of trees in a variety of habitats including coastal scrub, rainforest, gallery forest, savanna scrubland, urban garden, and along roadsides in coastal areas (from Antweb.org data).

Pest Status

Although *Tetramorium lanuginosum* can sting, it is not considered to be an economic pest in the Southeast.

Distribution

Tetramorium lanuginosum is native to tropical and subtropical Asia, and it is currently distributed worldwide in tropical and subtropical regions. It has an almost continuous range going from India all the way to northern Australia (Wetterer 2010d). Outside of Southeast Asia, *T. lanuginosum* is commonly found in the South Pacific Islands and around Madagascar. *Tetramorium lanuginosum* has been introduced to the Southeastern Gulf States of the U.S., though it has only been reported sporadically. In the U.S., *T. lanuginosum* has been reported from Alabama, Florida, Georgia, Hawaii, Louisiana, Mississippi, and South Carolina (AntWeb.org, Wetterer 2010d, and MEM). In Mississippi, the only MEM record of this species is from Clay County (Map 31).



Map 31. *Tetramorium lanuginosum* site records in Mississippi based on MEM specimens.

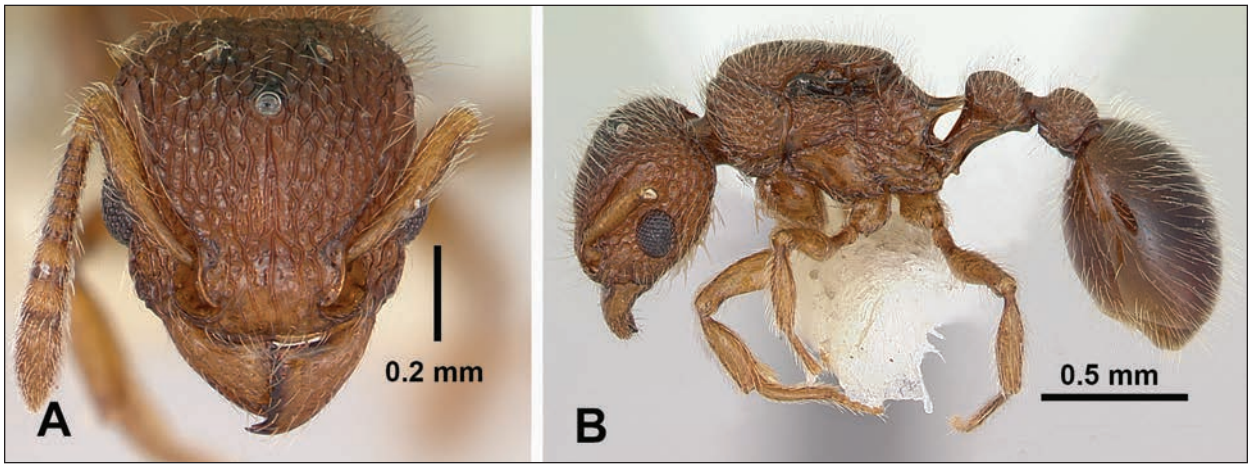


Figure 88. *Tetramorium lanuginosum* dealate queen (A) full face view and (B) lateral view (from Antweb.org, photo by April Nobile, Specimen: CASENT0173288).

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