

Key to the Exotic Ants (Hymenoptera: Formicidae) of Mississippi

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Workers of the 30 exotic species treated in the key

- 1** Body with a single isolated waist segment (petiole) between mesosoma and gaster; petiole sometimes reduced or partially concealed (Fig. 1A)..... **2**
- Body with two isolated waist segments (petiole and postpetiole) between mesosoma and gaster (Fig. 1B).....**14**



Figure 1. Body in lateral view. **(A)** *Brachyponera chinensis*; **(B)** *Pseudomyrmex gracilis*.

- 2 (1)** Sting absent; abdomen without a distinct constriction between abdominal segments III and IV (Fig. 2A, B).....**3**
- Sting present and functional; abdominal segments III and IV usually separated by a constriction (Fig. 2C); if constriction indistinct, mandibles long, linear, and inserted near middle of anterior head margin.....**10**

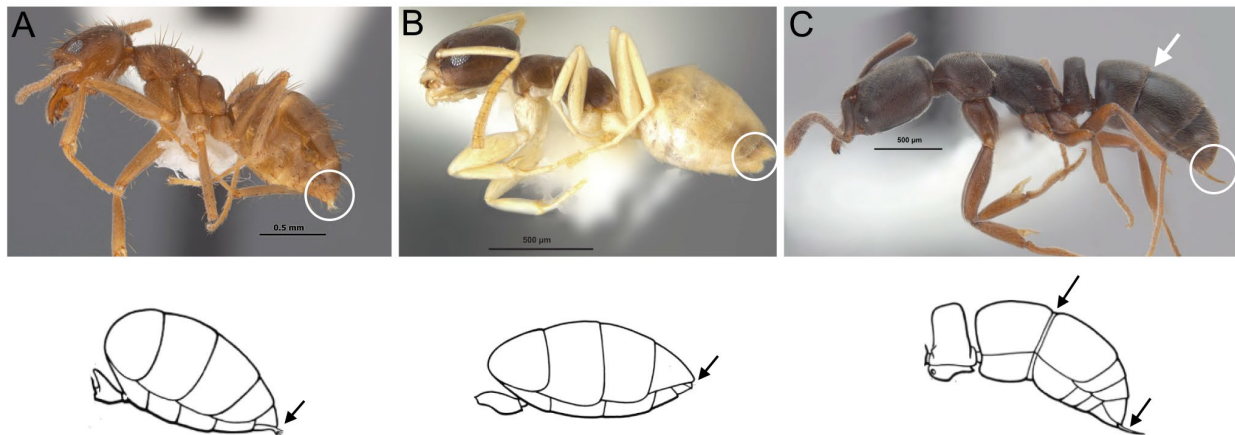


Figure 2. Body in lateral view. **(A)** *Nylanderia fulva*; **(B)** *Tapinoma melanocephalum*; **(C)** *Hypoponera opacipes*.

- 3 (2)** Gastral apex with a circular or semicircular acidopore, usually fringed with hairs (Fig. 3A); if fringe absent, antennal insertions well behind posterior clypeal margin (*Camponotus*).....**4 (Formicinae)**
- Acidopore absent; gastral apex with a transverse slit-like opening, without surrounding fringe of hairs (Fig. 3B); antennal insertions at or near posterior clypeal margin.....**9 (Dolichoderinae)**

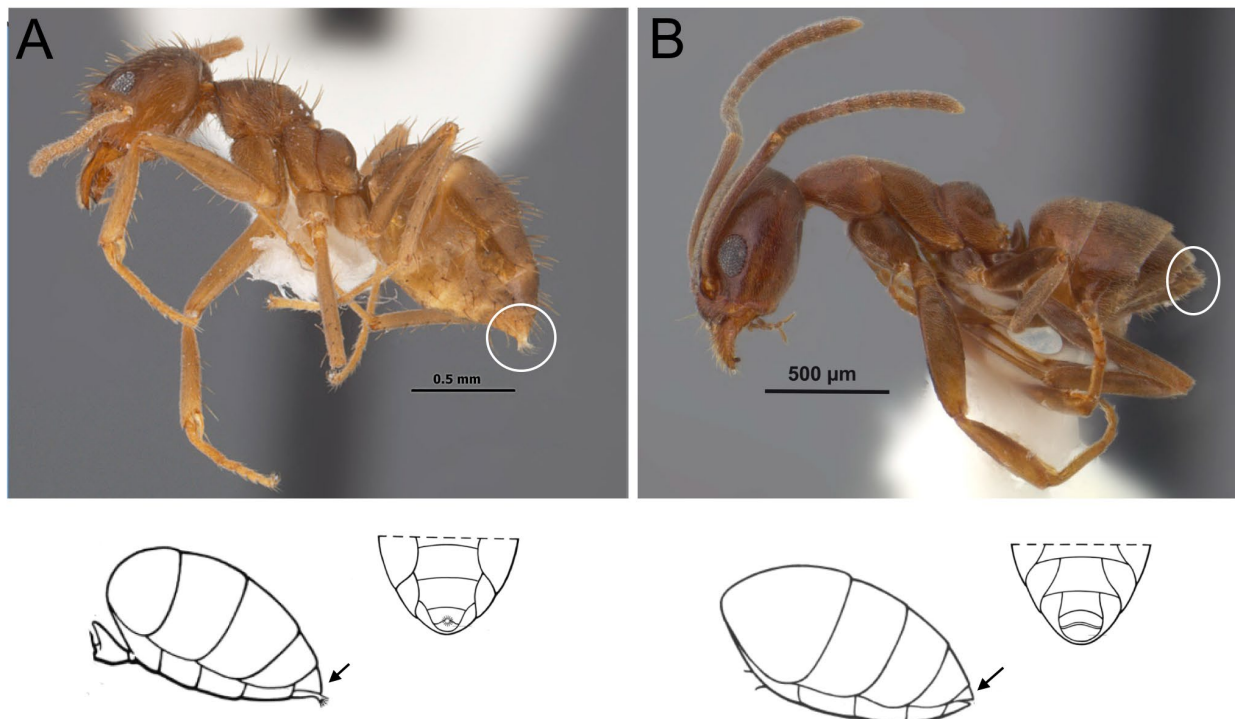


Figure 3. Gastral apex in lateral view. **(A)** *Nylanderia fulva*; **(B)** *Linepithema humile*.

- 4 (3)** Antenna 9-segmented; workers minute, about 1–2 mm (Fig. 4A).....**5**
 – Antenna 12-segmented; workers generally larger (Fig. 4B).....**6**

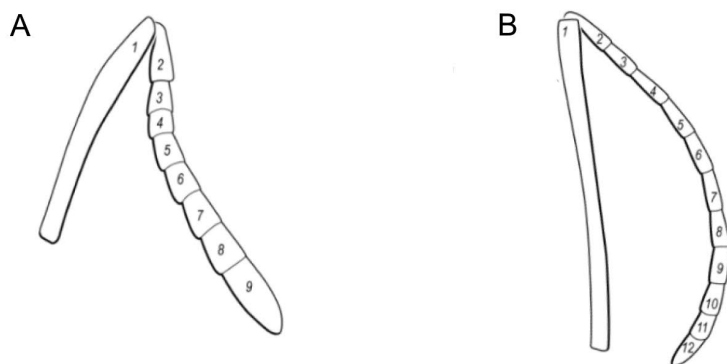


Figure 4. Antennae with (A) 9 and (B) 12 segments.

- 5 (4)** Scape surpassing posterior head margin by approximately the combined length of pedicel and first funicular segment (Fig. 5A); mesonotum with one pair of erect setae; gastral pubescence sparse (Fig. 5B).....***Brachymyrmex patagonicus*** (dark rover ant)
 – Scape only slightly surpassing posterior head margin (Fig. 5C); mesonotum without paired erect setae; gastral pubescence dense (Fig. 5D).....***Brachymyrmex obscurior*** (obscure rover ant)

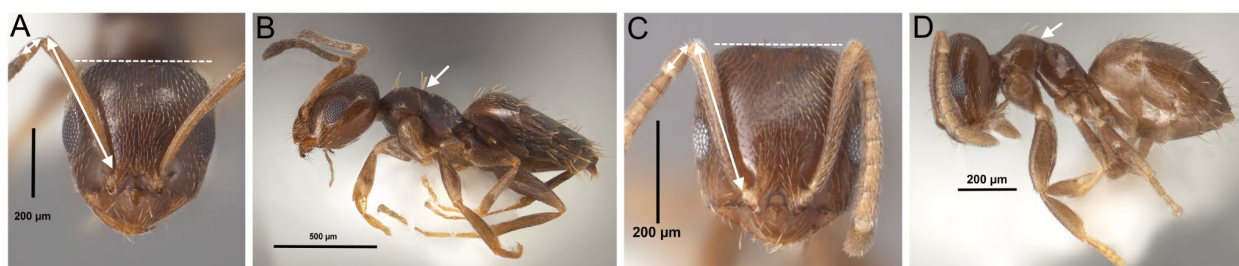


Figure 5. Head in full-face view and body in lateral view. **(A, B)** *Brachymyrmex patagonicus*; **(C, D)** *Brachymyrmex obscurior*.

- 6 (4)** Antennal insertions well behind posterior clypeal margin (Fig. 6A); workers polymorphic; metanotal depression indistinct.....**7**
 – Antennal insertions close to posterior clypeal margin (Fig. 6B); workers monomorphic; metanotal groove distinct.....**8**

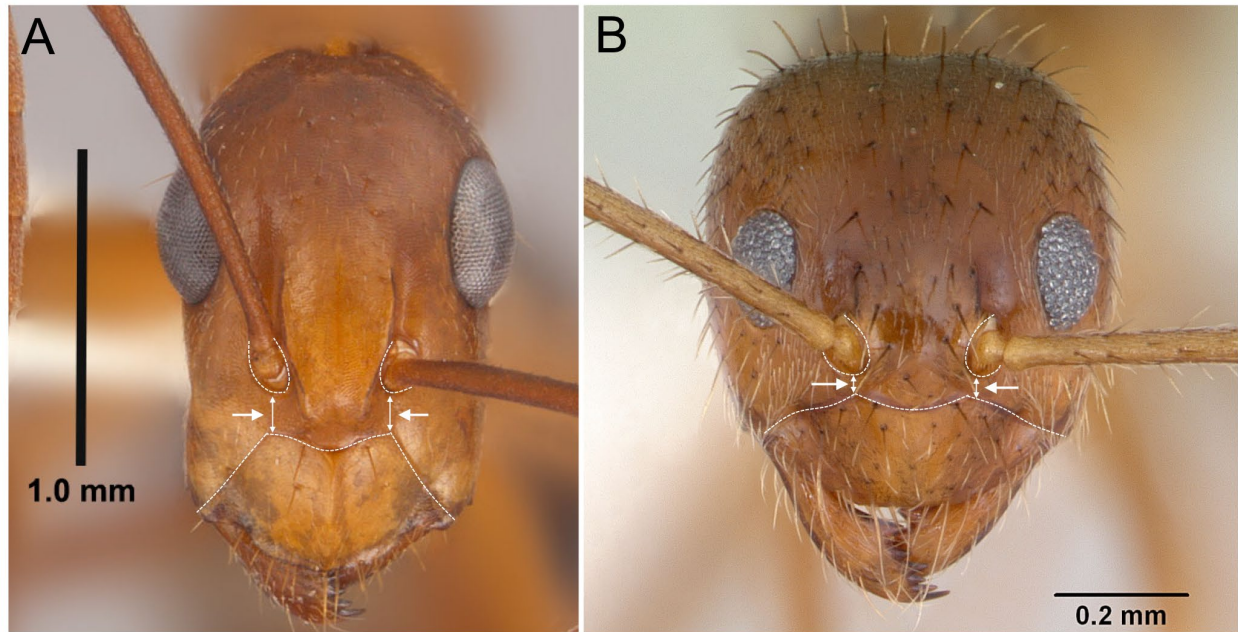


Figure 6. Head in full-face view. **(A)** *Camponotus tortuganus*; **(B)** *Nylanderia fulva*.

- 7 (6)** Workers smaller (minors 3.5–4.0 mm; majors 5.0–6.0 mm); head in full-face view about as broad as long, widest posteriorly and narrowing anteriorly (Fig. 7A); mesosoma compact, humeral angles distinct; abundant long, whitish erect setae (Fig. 7B).....***Camponotus planatus*** (compact carpenter ant)
- Workers larger (minors 6.5–8.0 mm; majors 8.5–10.0 mm); head distinctly longer than broad (Fig. 7C); mesosoma elongate, humeral angles rounded; head, especially cheeks, with fewer erect setae; body relatively shiny (Fig. 7D).....***Camponotus cf. tortuganus*** (Tortugas carpenter ant)

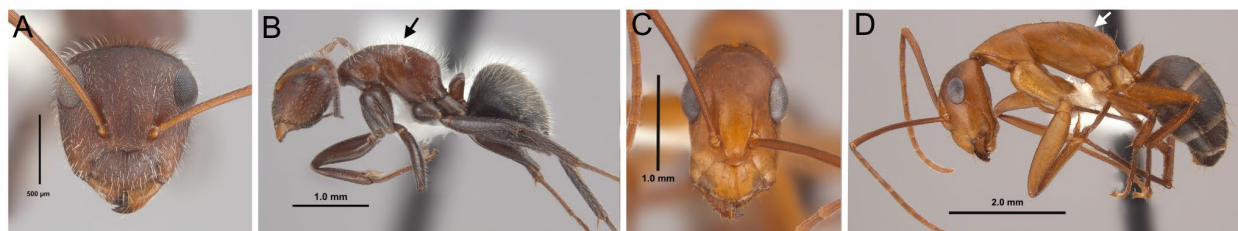


Figure 7. Head in full-face view and body in lateral view. **(A, B)** *Camponotus planatus*; **(C, D)** *Camponotus cf. tortuganus*.

- 8 (6)** Scapes and legs extremely long (Fig. 8A); body slender; scapes lacking conspicuous erect macrosetae; body usually dark brown to blackish (Fig. 8B).....***Paratrechina longicornis*** (longhorn crazy ant)
- Scapes and legs shorter (Fig. 8C); body more robust; scapes with conspicuous erect macrosetae; body generally reddish brown (Fig. 8D).....***Nylanderia fulva*** (tawny crazy ant*)

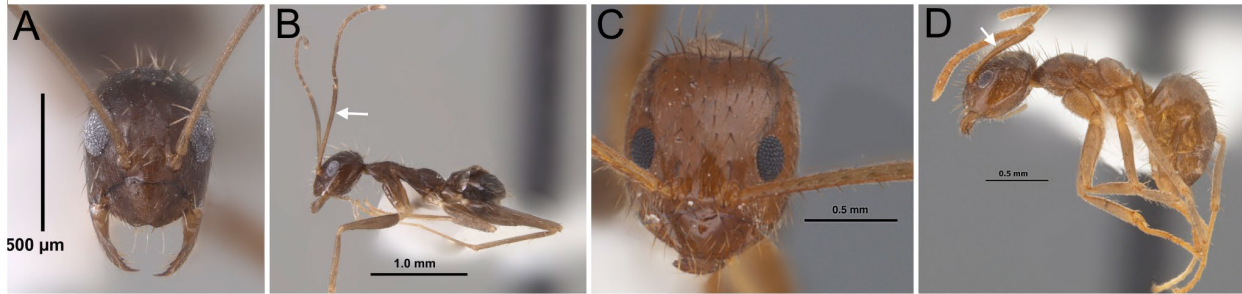


Figure 8. Head in full-face view and body in lateral view. **(A, B)** *Paratrechina longicornis*; **(C, D)** *Nylanderia fulva*.

- 9 (3)** Petiole strongly reduced, without an upright node and usually hidden beneath anterior gaster; head and mesosoma dark brown, gaster and legs conspicuously pale (Fig. 9A, B).....***Tapinoma melanocephalum*** (ghost ant)
- Petiole with a distinct upright scale visible in profile, not concealed by gaster; body relatively uniformly brown (Fig. 9C, D).....***Linepithema humile*** (Argentine ant)

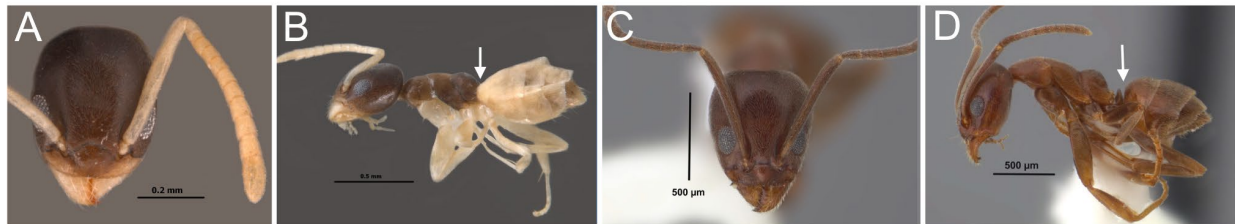


Figure 9. Head in full-face view and body in lateral view. **(A, B)** *Tapinoma melanocephalum*; **(C, D)** *Linepithema humile*.

- 10 (2)** Tergite of abdominal segment IV with coarse longitudinal costae; hind coxa with dorsal spine; pretarsal claw with subapical tooth (Fig. 10A, B).....***Poneracantha triangularis*** (South American grooved ant)
- [Ectatomminae]**
- Tergite of abdominal segment IV smooth or finely sculptured, lacking strong longitudinal costae; hind coxa without dorsal spine (Fig. 10C, D).....**11**

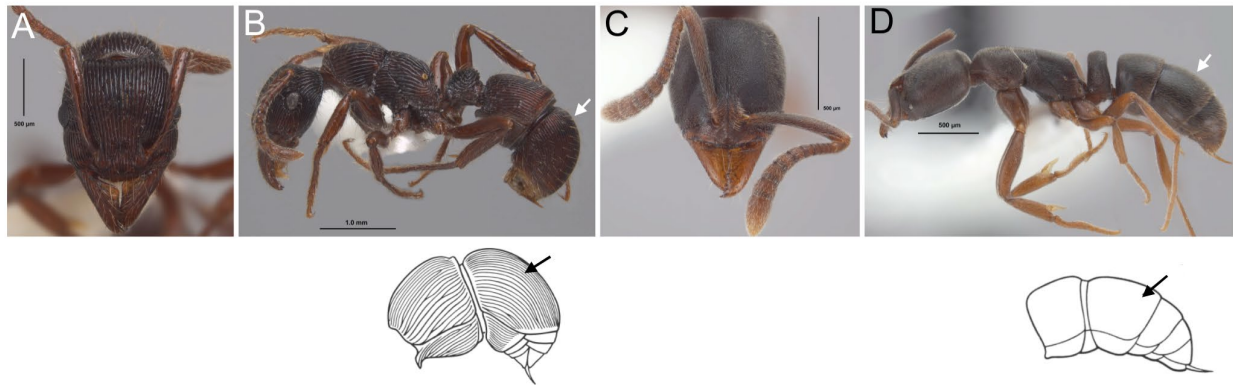


Figure 10. Head in full-face view and body in lateral view. **(A, B)** *Poneracantha triangularis*; **(C, D)** *Hypoponera opacipes*.

- 11(10)** Mandibles very long and linear, inserted close together near middle of anterior head margin (Fig. 11A); petiolar node with prominent terminal spine; workers large, about 9–11 mm (Fig. 11B).....***Odontomachus haematodus*** (two-spined trap-jaw ant)
- Mandibles triangular, inserted near anterolateral corners of head (Fig. 11C); petiole without elongate terminal spine (Fig. 11D); workers smaller.....**12**

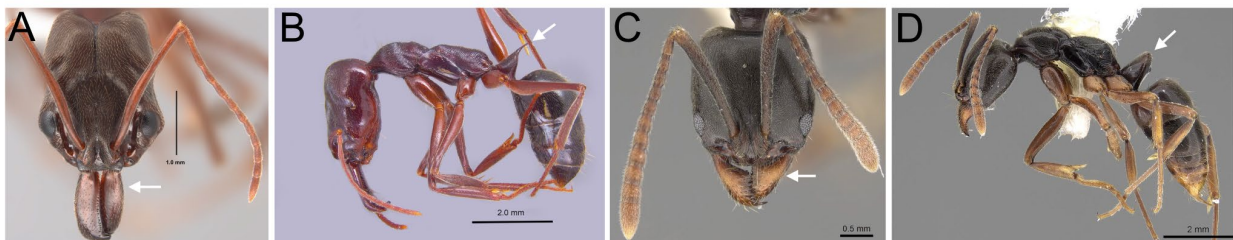


Figure 11. Head in full-face view and body in lateral view. **(A, B)** *Odontomachus haematodus*; **(C, D)** *Brachyponera chinensis*.

- 12 (11)** Workers relatively large, about 4–5 mm; eyes small but distinct (Fig. 12A); body dark brown to blackish; promesonotum distinctly differentiated from propodeum (Fig. 12B).....***Brachyponera chinensis*** (Asian needle ant)
- Workers smaller, usually 2–3 mm; eyes minute, with few facets; promesonotum not strongly differentiated from propodeum (Fig. 12C).....**13**



Figure 12. Head in full-face view and body in lateral view. (A, B) *Brachyponera chinensis*; (C) *Hypoponera punctatissima*.

- 13 (12)** Mesopleuron partly to entirely granulate or punctate; body densely punctate-granulate, dull to subopaque; anterior and posterior faces of petiolar node nearly parallel (Fig. 13A, B).....***Hypoponera opaciceps*** (granulate mini-ponerine ant)
- Mesopleuron mostly smooth and shiny; body generally more shining; petiolar node relatively high and short in profile (Fig. 13C, D).....***Hypoponera punctatissima*** (pantropical mini-ponerine ant)



Figure 13. Head in full-face view and body in lateral view. (A, B) *Hypoponera opaciceps*; (C, D) *Hypoponera punctatissima*.

- 14 (1)** Antenna 6-segmented; workers minute, often with specialized hairs and spongiform tissue on waist (Fig. 14A).....**15**
- Antenna 10–12-segmented; combination of characters otherwise not as above (Fig. 14B, C).....**19**

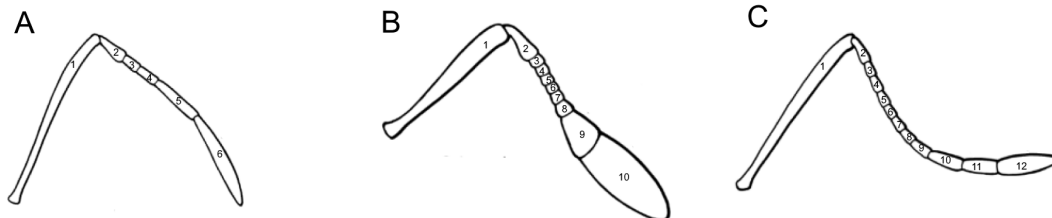


Figure 14. Antennae with (A) 6, (B) 10, and (C) 12 segments.

- 15 (14)** Mandibles long and narrow, sublinear to linear, touching only near apices when closed (Fig. 15A).....**16**
 – Mandibles triangular to elongate-triangular, meeting along at least apical half when closed (Fig. 15B).....**17**

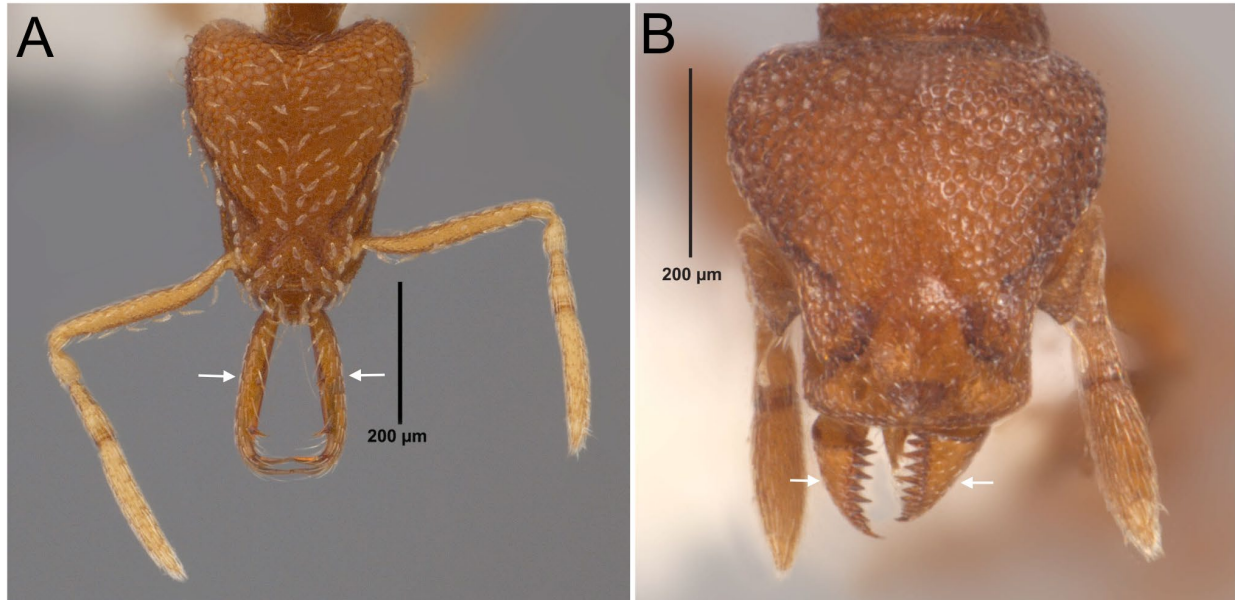


Figure 15. Head in full-face view. (A) *Strumigenys silvestrii*; (B) *Strumigenys membranifera*.

- 16 (15)** Apicodorsal mandibular teeth extremely long, crossing opposite mandible; facial hairs large, flat, and circular; scapes short (Fig. 16A, B).....***Strumigenys hexamera*** (Japanese mini trap-jaw ant)
 – Apicodorsal teeth shorter and not crossing; one elongate preapical tooth; facial hairs clavate; scapes longer (Fig. 16C, D).....***Strumigenys silvestrii*** (Silvestri's mini trap-jaw ant)

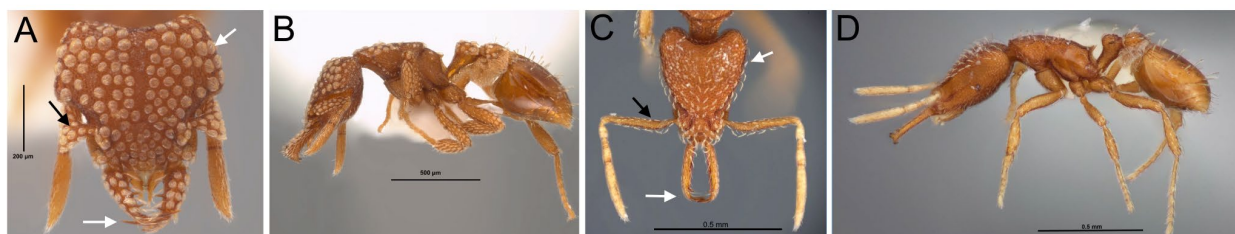


Figure 16. Head in full-face view and body in lateral view. (A, B) *Strumigenys hexamera*; (C, D) *Strumigenys silvestrii*.

- 17 (15)** Ventral petiole without spongiform tissue; first gastral tergite densely sculptured throughout (Fig. 17A, B).....***Strumigenys margaritae*** (Margaret's mini trap-jaw ant)

- Ventral petiole with conspicuous spongiform tissue; first gastral tergite mostly smooth beyond basal costulae (Fig. 17C).....18



Figure 17. Head in full-face view and body in lateral view. (A, B) *Strumigenys margaritae*; (C) *Strumigenys epinotalis*.

- 18 (17)** Mandibles lacking basal transverse rim (Fig. 18A); pronotum with a curved row of spoon-shaped hairs on arched transverse ridge (Fig. 18B).....***Strumigenys epinotalis*** (tree-hole mustache ant)
- Mandibles with sharp basal transverse rim immediately anterior to clypeal margin (Fig. 18C); pronotum without such a row of hairs (Fig. 18D).....***Strumigenys membranifera*** (membranous mini trap-jaw ant)

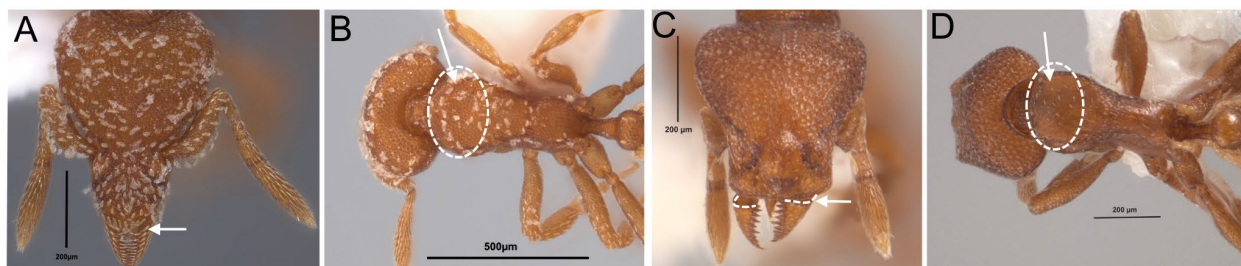


Figure 18. Head in full-face view and body in lateral view. (A, B) *Strumigenys epinotalis*; (C, D) *Strumigenys membranifera*.

- 19 (14)** Antenna 10- or 11-segmented (Fig. 19A, B).....20
- Antenna 12-segmented (Fig. 19C).....22

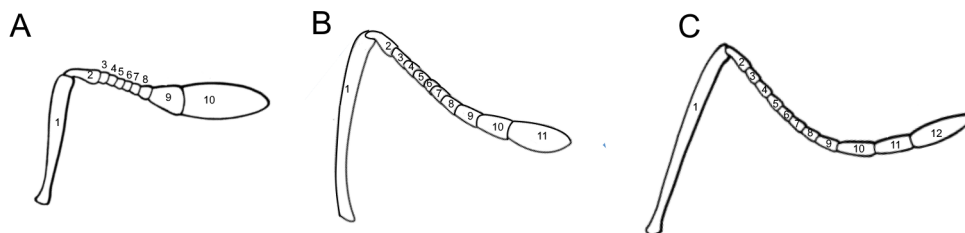


Figure 19. Antennae with (A) 10, (B) 11, and (C) 12 segments.

- 20 (19)** Antenna 10-segmented; workers polymorphic; body without scale-like hairs (Fig. 20A, B).....**21**
 – Antenna 11-segmented; workers monomorphic, with appressed scale-like hairs; frontal lobes expanded; mesosoma tuberculate (Fig. 20C, D).....**Cyphomyrmex rimosus** (rimose fungus ant)

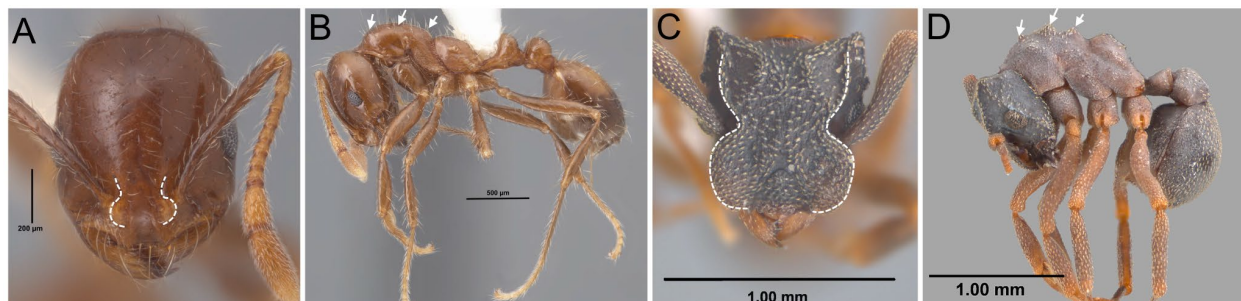


Figure 20. Head in full-face view and body in lateral view. (A, B) *Solenopsis invicta*; (C, D) *Cyphomyrmex rimosus*.

- 21 (20)** Head and mesosoma usually reddish brown, gaster darker; scapes brown; pronotal humeral angles weak (Fig. 21A, B).....**Solenopsis invicta** (red imported fire ant)
 – Head and mesosoma dark brown to blackish; scapes black; pronotal humeral angles distinct (Fig. 21C, D).....**Solenopsis richteri** (black imported fire ant)

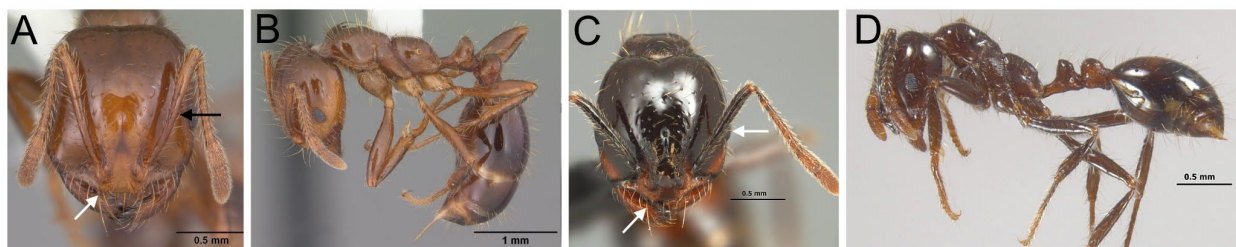


Figure 21. Head in full-face view and body in lateral view. (A, B) *Solenopsis invicta*; (C, D) *Solenopsis richteri*.

- 22 (19)** Body elongate and slender; eyes large and elongate; frontal carinae close together, antennal insertions nearly touching (Fig. 22A, B).....**Pseudomyrmex gracilis** (graceful twig ant)
 – Body more compact; eyes smaller; frontal carinae and antennal insertions more widely separated (Fig. 22C, D).....**23**

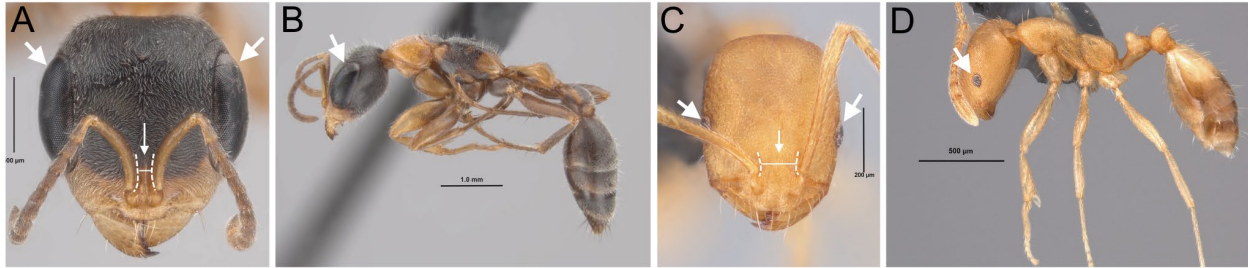


Figure 22. Head in full-face view and body in lateral view. **(A, B)** *Pseudomyrmex gracilis*; **(C, D)** *Monomorium pharaonis*.

- 23 (22)** Propodeum unarmed, without spines or teeth (Fig. 23A).....**24**
 – Propodeum with a pair of distinct spines or teeth (Fig. 23B).....**25**

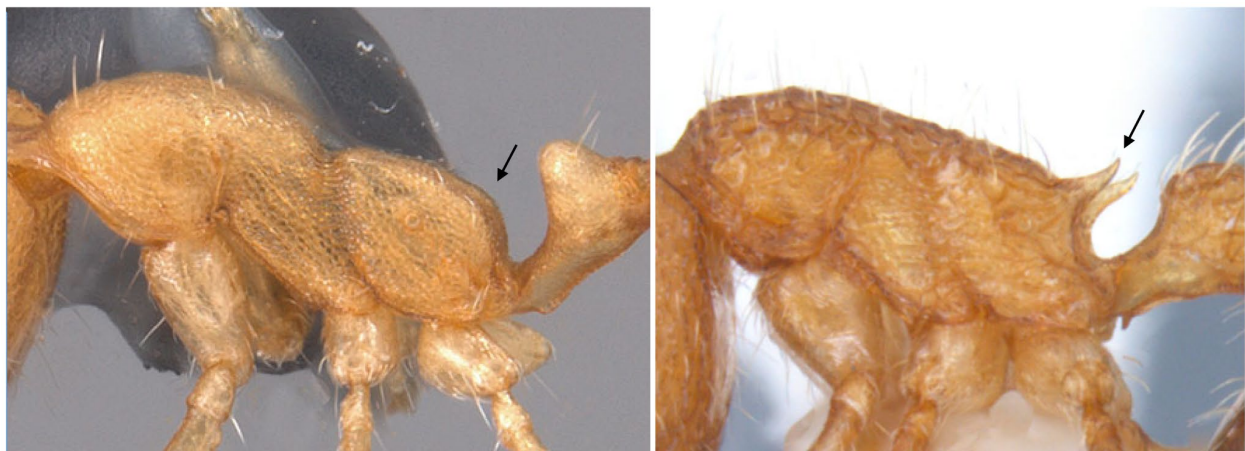


Figure 23. Mesosoma in lateral view. **(A)** *Monomorium pharaonis*; **(B)** *Tetramorium bicarinatum*.

- 24 (23)** Body yellow to golden yellow, posterior gaster usually darker; petiolar node relatively high and narrow (Fig. 24A, B).....***Monomorium pharaonis***
 (pharaoh ant)
 – Body distinctly bicolored, head and gaster dark, mesosoma yellow to orange-brown; petiolar node lower and broader (Fig. 24C, D)..***Monomorium floricola***
 (flower ant)

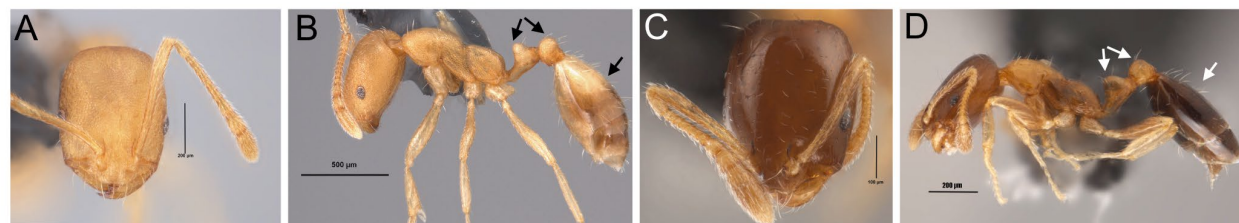


Figure 24. Head in full-face view and body in lateral view. **(A, B)** *Monomorium pharaonis*; **(C, D)** *Monomorium floricola*.

- 25 (23)** Lateral clypeal margins immediately anterior to antennal insertions raised into distinct sharp carinae, partially enclosing antennal sockets (Fig. 25A); middle and hind tibial spurs simple or absent; petiolar node rounded to subquadrate in profile.....**26**
- Lateral clypeal margins anterior to antennal insertions flat or weakly elevated, without sharp carinae around antennal sockets (Fig. 25B); if clypeal ridges present, middle and hind tibial spurs pectinate and petiolar node triangular in profile.....**28**

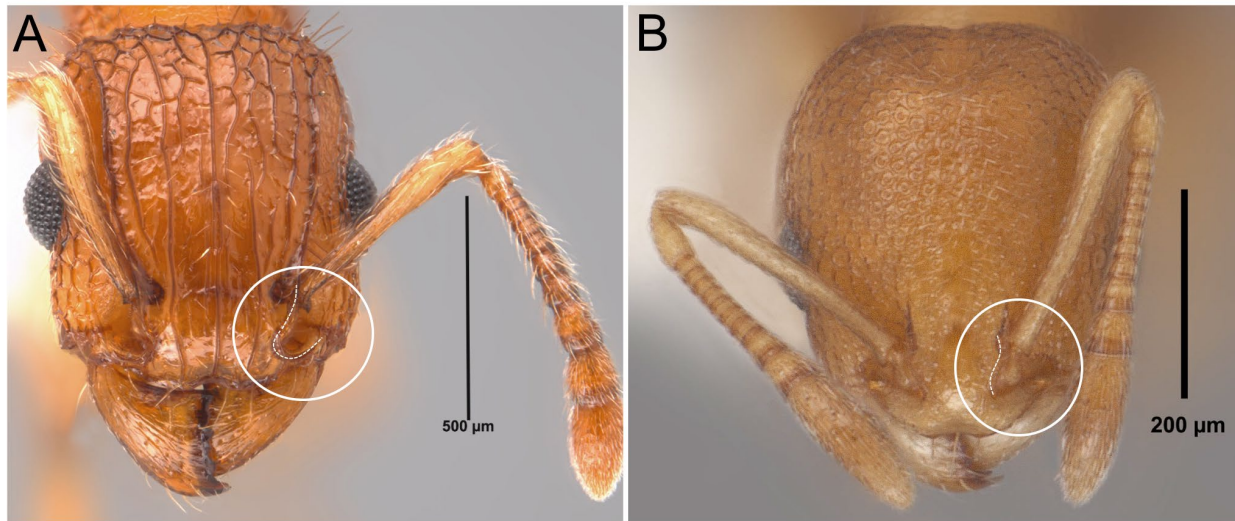


Figure 25. Head in full-face view. **(A)** *Tetramorium bicarinatum*; **(B)** *Cardiocondyla wroughtonii*.

- 26 (25)** Dorsal setae dense, many bifid or trifid, giving body a woolly appearance (Fig. 26A, B).....***Tetramorium lanuginosum*** (woolly pavement ant)
- Dorsal setae simple, never branched (Fig. 26C, D).....**27**



Figure 26. Head in full-face view and body in lateral view. **(A, B)** *Tetramorium lanuginosum*; **(C, D)** *Tetramorium immigrans*.

- 27 (26)** Head and mesosoma yellow- to orange-brown, contrasting with dark gaster; mandibles with conspicuous longitudinal striae; posterior head coarsely reticulate (Fig. 27A, B)...***Tetramorium bicarinatum*** (bicolored pavement ant)
- Body more uniformly reddish to dark brown; mandibles without conspicuous longitudinal striae; posterior head predominantly with longitudinal rugae (Fig. 27C, D).....***Tetramorium immigrans*** (immigrant pavement ant)

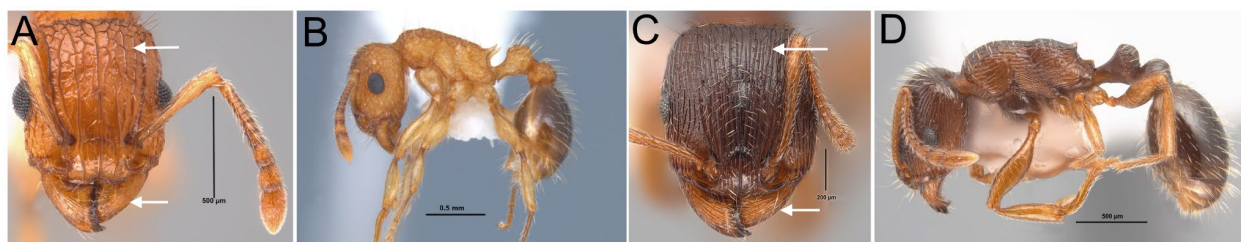


Figure 27. Head in full-face view and body in lateral view. **(A, B)** *Tetramorium bicarinatum*; **(C, D)** *Tetramorium immigrans*.

28 (25) Anterior clypeal margin with a single long median seta projecting over mandibles; lateral clypeal portions flattened and projecting over mandibular bases (Fig. 28A); postpetiole broadly rounded and wider than petiole in dorsal view (Fig. 28B); head and mesosoma without erect setae; body yellowish brown, first gastral tergite often darkened.....***Cardiocondyla wroughtonii*** (Wroughton's sneaking ant)

– Anterior clypeal margin lacking a single projecting median seta; lateral clypeal portions not projecting over mandibular bases (Fig. 28C); postpetiole variable (Fig. 28D); erect setae usually present on head and mesosoma; workers typically dimorphic, majors with enlarged heads.....**29**

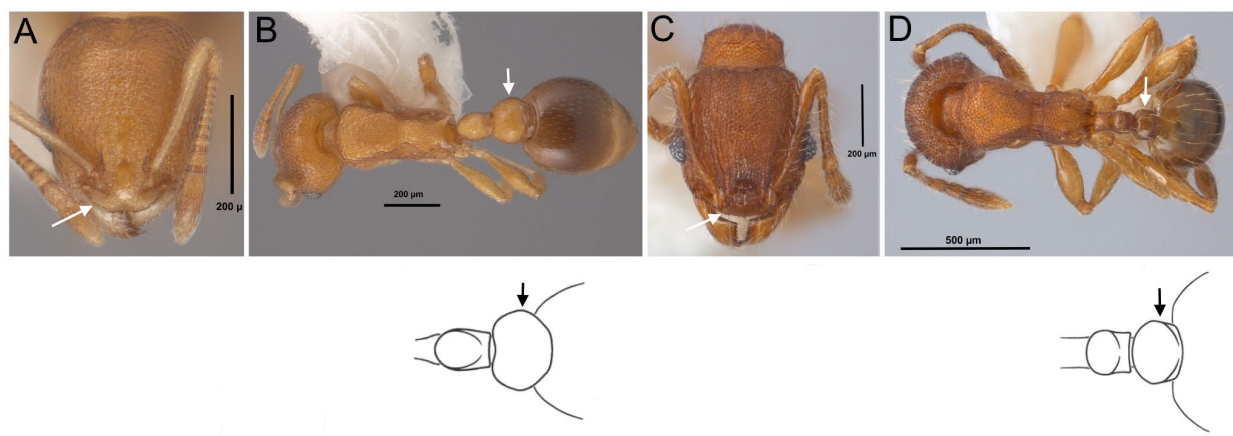


Figure 28. Head in full-face view and body in dorsal view. **(A, B)** *Cardiocondyla wroughtonii*; **(C, D)** *Pheidole navigans*.

29 (28) Major: Large (5–6 mm); head densely rugoreticulate, antennal scrobes absent (Fig. 29A). **Minor:** Head smooth and shiny, posterior margin strongly convex; scapes extending beyond posterior head margin by more than twice eye length (Fig. 29B); pronotum raised above mesonotum, producing a stepped profile (Fig. 29C).....***Pheidole obscurithorax*** (dark-bodied big-headed ant)

– **Major:** Small (2–3 mm); head predominantly longitudinally rugose; antennal scrobes narrow, shallow, and smooth (Fig. 29D). **Minor:** Head densely

punctate and dull; scapes barely surpassing posterior head margin (Fig. 29E); promesonotum evenly convex, without a distinct step (Fig. 29F).....***Pheidole navigans*** (navigating big-headed ant)

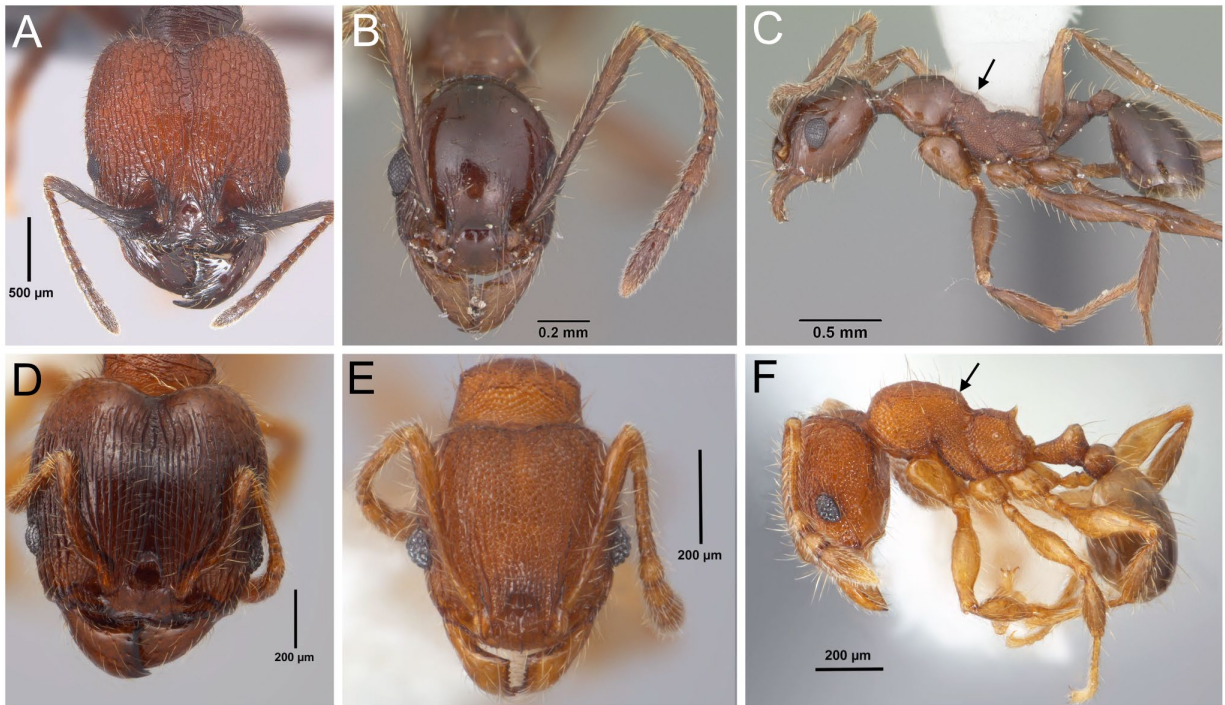


Figure 29. Head in full-face view and mesosoma in lateral view. **(A–C)** *Pheidole obscurithorax*; **(D–F)** *Pheidole navigans*.

Acknowledgments

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