The World of the Harvester Ants

by Stephen Welton Taber

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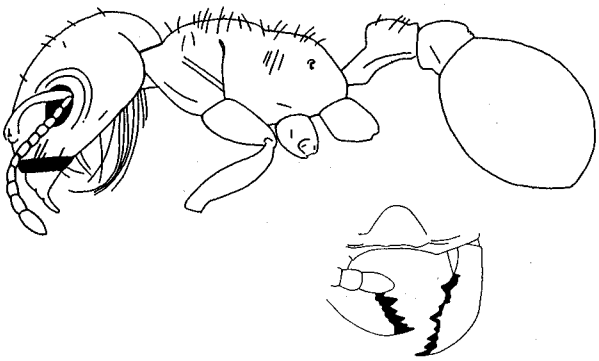


Pogonomyrmex snellingi. *Reddish brown. A new species. The jaws resemble those of the closest relative of the harvesters,* Hylomyrma. *This is a type specimen. Snelling's harvester.*

Pogonomyrmex subdentatus. *Small, reddish brown, and primitive in appearance.*

Keys to the Nonparasitic Species of EPHEBOMYRMEX and POGONOMYRMEX

I. KEY TO *EPHEBOMYRMEX* (ALL SPECIES)

1. a. dorsum of basal segment of gaster with longitudinal rugae or striae 2
   b. dorsum of basal segment of gaster without longitudinal rugae or striae 5
2. a. dorsum of basal segment of gaster entirely or mostly covered by rugae or striations ..... *mayri* (Colombia, Guyana) L = 7.6–9.0 mm
   b. rugae or striae of dorsum of basal segment of gaster confined to basal half of segment, sometimes found only near insertion of postpetiole 3
3. a. anterior margin of clypeus convex, with small median triangular tooth ..... *sylvestris* (Venezuela) L = 5.0 mm
   b. anterior margin of clypeus slightly excised or almost straight, but not broadly convex, margin without a small median triangular tooth 4
4. a. petiole and postpetiole not massive (see species drawing) ..... *naegelii* (much of South America) L = 4.0–5.0 mm
   b. petiole and postpetiole massive (see species drawing) ..... *abdominalis* (southern South America) L = 4.0–4.5 mm
5. a. maxillary palps with 5 segments, labial palps with 4 segments 6
   b. maxillary palps with 4 segments, labial palps with 3 segments 8
6. a. head and alitrunk yellow or reddish, but not black ..... *odoratus* (Argentina, Chile) L = 4.4–4.8 mm
   b. head and alitrunk black or blackish 7
7. a. occiput and much of thoracic dorsum smooth, shining, few if any reticulations present, same for dorsum of petiolar node ..... *laevigatus* (Argentina, Chile) L = 4.5–5.0 mm
   b. occiput with prominent reticulations and areolations, same for dorsum of thorax and petiolar node ..... *angustus* (Argentina, Chile) L = 4.6–6.0 mm
8. a. alitrunk in profile with distinct mesopropodeal depression, so that profile is not broadly convex (South America) .. 9

b. alitrunk in profile without distinct mesopropodeal depression, so that profile is broadly convex 10

9. a. head and alitrunk yellow, orange, or red, but not black.. ..... *cunicularius* (southern South America) L = 6.2–9.4 mm (worker), L = 12.0 mm (ergatogyne)

b. head and alitrunk black or blackish red .... *brevibarbis* (Argentina) L = 5.0–7.0 mm

10. a. anterior margin of clypeus broadly convex, head and alitrunk blackish or blackish red, setae of dorsum of basal segment of gaster erect or semierect and black (Haiti) 11

b. anterior margin of clypeus excised or straight, but not broadly convex, head and alitrunk yellow, red, or reddish brown, but never blackish (not Haiti) 12

11. a. petiolar node in dorsal view fan-shaped or shaped like baseball catcher's mitt (rugae present but rather sparse) ..... *saucius* (Haiti) L = 5.0–5.5 mm

b. petiolar node in dorsal view miter-shaped (node covered with coarse rugae) ..... *schmitti* (Haiti) L = 3.5–4.5 mm

12. a. lateral clypeal projections prominent 13

b. lateral clypeal projections absent or very weak 14

13. a. propodeal spines absent, dorsum of petiolar node with little or no rugae, the surface almost smooth .... *laevinodis* (Baja California) L = 3.5 mm

b. propodeal spines present, dorsum of petiolar node with conspicuous rugae .... *imberbiculus* (U.S., Mexico) L = 4.0–4.8 mm

14. a. dorsum of basal segment of gaster with fine and appressed setae (lying flat or nearly so against the surface), dorsum of segment smooth and shining (not shagreened) .... *tenuipubens* (Argentina, Paraguay) L = 5.0 mm

b. setae on dorsum of basal segment of gaster erect or suberect (not appressed), dorsum of gaster at least lightly shagreened ..... *pima* (U.S., Mexico) L = 3.5–4.0 mm

KEY TO NORTH AMERICAN *POGONOMYRMEX*

1. a. thoracic setae dark (brownish black), propodeum unarmed (lacking spines or tubercles), clypeal apron strongly bidentate .... *guatemaltecus* (Guatemala, Mexico) L = 5.0–5.5 mm

b. thoracic setae clear or whitish 2

2. a. venter of petiolar peduncle (near area that is or would be occupied by the ventral process) with one or more distinct setae (*barbatus* species complex) 3

b. venter of petiolar peduncle (near area that is or would be occupied by the ventral process) without distinct seta(e) 11

3. a. occipital corners with conspicuous rugae or striae 4

b. occipital corners without conspicuous rugae or striae (smooth and shining) 7

4. a. rugae of thoracic dorsum with conspicuous reticulation, cephalic and thoracic rugae coarse, widely spaced, head and/or thorax usually blackish or dark brown ..... *rugosus* (U.S., Mexico) L = 7.0–9.5 mm

b. rugae of thoracic dorsum without conspicuous reticulation, color red or brownish red, but not blackish 5

5. a. very large ants (9.5–11.5 mm), red, scape base strongly compressed (almost spatulate) and usually with pubescence, scape shaft with a few rugae or striae ..... *wheeleri* (Mexico)

b. lacking the above character combination 6

6. a. scape base strongly developed (flared) with a trough or concavity, lateral clypeal lobes conspicuous, basal mandibular tooth slightly offset ..... *barbatus* (U.S., Mexico) L = 7.0–9.5 mm

b. scape base only moderately developed, lacking conspicuous trough or concavity, lateral clypeal lobes absent or inconspicuous, basal mandibular tooth not slightly offset, gaster often (but not always) blackish ..... *bicolor* (U.S., Mexico) L = 7.2–8.2 mm

7. a. propodeum unarmed (lacking spines or tubercles) 8

b. propodeum armed (with spines or tubercles) 10

8. a. mandible with less than 7 teeth, basalmost tooth strongly offset from margin, in full-face view cephalic rugae often sparse, base of antenna scape weakly developed, hardly flared ..... *bigbendensis* (U.S., Mexico) L = 5.5–6.0 mm

b. lacking the above character combination 9

9. a. declivious face of propodeum without rugae or striae, color usually orange-yellow, but sometimes deep red, clypeal

margin deeply excised... *texanus* (U.S.) L = 9.0–10.0 mm

b. declivious face of propodeum with rugae or striae, color usually red, clypeal margin very strongly excised, sometimes almost to the frontal lobes ..... *apache* (U.S., Mexico) L = 7.5–9.0 mm

10. a. lateral clypeal projections prominent, base of antenna scape with conspicuous trough or depression ..... *tenuispina* (U.S., Mexico) L = 6.5–8.5 mm

b. lateral clypeal projections absent or inconspicuous, base of antenna scape without conspicuous trough or depression ..... *desertorum* (U.S., Mexico) L = 5.5–6.5 mm

11. a. with head in full-face view, sides of head behind eyes converging posteriorly, propodeum unarmed, with head in lateral view, eye located distinctly below midpoint of side of head ..... *badius* (U.S.) L = 7.0–11.0 mm (including major)

b. lacking the above character combination 12

12. a. mandible with 6 teeth 13

b. mandible with 7 or more teeth 14

13. a. eye surrounded by whorled rugae (circumocular whorls), propodeum unarmed ..... *anzensis* (U.S.) L= 6.0 mm

b. eye without circumocular whorls, propodeum armed ..... *huachucanus* (U.S., Mexico) L = 4.5–5.0 mm

14. a. cephalic interrugal sculpture beaded, dorsum of petiolar node not distinctly flattened 15

b. cephalic interrugal sculpture not presenting a beaded appearance, or if beaded, then dorsum of petiolar node is distinctly flattened 20

15. a. basal mandibular tooth strongly offset from basal margin ..... *occidentalis* (U.S., Canada, Mexico) L = 6.5–8.5 mm

b. basal mandibular tooth not strongly offset 16

16. a. eyes with circumocular whorls, dorsum of both petiolar and postpetiolar nodes with few or no rugae, propodeal spines (if present), usually little more than tubercles ..... *maricopa* (in part) (U.S., Mexico) L = 6.0–9.0 mm

b. eyes without circumocular whorls, or if whorls are present, then conspicuous propodeal spines are also present, dorsum of petiolar and postpetiolar nodes usually with at least a few distinct rugae 17

17. a. alitrunk profile rather convex in outline, ventral process of petiole very well developed, ventral process of postpetiole robust ..... *subdentatus* (U.S.) L = 6.0 mm
    b. lacking the above character combination 18
18. a. frontal lobes large, broadly and evenly convex, scape base very well developed, propodeal spines (if present) short, ventral process of petiolar peduncle absent or weak .... *brevispinosus* (U.S.) L = 5.5–6.0 mm
    b. lacking the above character combination 19
19. a. base of antenna scape angular and dorsum of petiolar and postpetiolar nodes with 5 or more rugae on posterior half ..... *montanus* (U.S.), length = 6.0–6.5 mm
    b. base of antenna scape rounded or angular, if angular then dorsum of petiolar and postpetiolar nodes with less than 5 distinct rugae on posterior half .... *salinus* (U.S., Canada) L = 5.0–7.0 mm
20. a. propodeal spines present 21
    b. propodeal spines absent (tubercles at best) 23
21. a. eyes with circumocular whorls, basal face of propodeum in profile not roughly horizontal, but sloping so that alitrunk is rather broadly convex, basal margin of mandible at least weakly convex (not straight) 22
    b. eye usually not surrounded by unbroken circumocular whorls, but if whorls are present then basal margin of mandible is roughly straight, basal face of propodeum in profile is almost horizontal so that alitrunk profile is not broadly convex, propodeal spines are well developed .... *subnitidus* (U.S., Mexico) L = 7.0 mm
22. a. dorsum of petiolar node (in profile) conspicuously flattened and covered with conspicuous rugae, propodeal spines well developed ..... *comanche* (U.S.) L = 6.5–8.0 mm
    b. lacking above character combination .... *maricopa* (in part) (U.S., Mexico) L = 6.0–9.0 mm
23. a. dentary margin of mandible not roughly transverse but oblique, basal tooth strongly offset from basal margin, which is short ..... *snellingi* (Mexico) L = 6.5 mm
    b. lacking above character combination 24
24. a. dorsum of first gaster segment smooth and shiny (lacking shagreen), circumocular whorls few and weak, basal man-

dibular tooth slightly offset from margin, alitrunk in profile without conspicuous mesopropodeal depression, propodeum unarmed ..... species B (U.S.) L = 4.0 mm

b. lacking above character combination 25

25. a. eye very large (eye length roughly equal to distance between eye and mandible insertion), small ants (4.7–5.2 mm) ..... *magnacanthus* (U.S., Mexico)

b. eye not unusually large (eye length clearly less than distance between eye and mandible insertion) 26

26. a. cephalic interrugal areolation absent to moderate (never beaded), interrugal areolation of mesopleuron and pronotal sides very weak to absent, interrugal spaces shiny .... *californicus* (U.S., Mexico) L = 5.5–8.7 mm

b. cephalic interrugal areolation of head, mesopleuron, and pronotal sides moderate to strong, interrugal spaces subopaque .... *maricopa* (in part) (U.S., Mexico) L = 6.0–9.0 mm

KEY TO SOUTH AMERICAN *POGONOMYRMEX*

1. a. interrugal areolation dense, presenting a beaded appearance 2

b. interrugal areolation not dense enough to present a beaded appearance 17

2. a. propodeum unarmed (with tubercles at best) 3

b. propodeum armed with short or long spines 4

3. a. dorsum of first gaster segment partly or entirely covered with conspicuous longitudinal rugae ..... *longibarbis* (in part) (Argentina, Bolivia) L = 6.0–7.0 mm

b. dorsum of first gaster segment without rugae .... *inermis* (Argentina) L = 5.0–6.5 mm

4. a. humeral angles rounded, not sharp 5

b. humeral angles sharp (not smoothly rounded) 6

5. a. scape base strongly developed, trumpet-shaped .... *bispinosus* (Chile) L = 7.8–8.0 mm

b. scape base only moderately developed, not flared into trumpet-shape ....*uruguayensis* (Argentina, Uruguay) L = 5.5–6.5 mm

6. a. head, alitrunk, and abdomen all black or blackish (I have heard that red-headed *P. carbonarius* workers exist, but I

have not seen any nor have I encountered them in a published report.) 7

b. of head, alitrunk, and abdomen, at least one not black or blackish 9

7. a. propodeal spines connected by prominent keel, dorsum of first segment of gaster mostly or entirely covered by conspicuous longitudinal rugae .... *carbonarius* (Argentina) L = 6.5–7.0 mm

b. propodeal spines lacking a prominent connecting keel 8

8. a. basal margin of mandible roughly straight, not convex, at least one mandible with 7–8 teeth .... *atratus* (Argentina) L = 6.5–7.0 mm

b. basal margin of mandible at least slightly convex, usually at least one mandible with only 6 teeth ..... *vermiculatus* (in part) (Argentina, Chile) L = 4.9–7.5 mm

9. a. metasternal flanges absent, weak, or difficult to discern with alitrunk in profile view 10

b. metasternal flanges at least moderately developed, clearly visible with alitrunk in profile (more typical of the genus) 11

10. a. dorsum of first gaster segment without rugae .... *laticeps* (Argentina) L = 8.0–8.5 mm

b. dorsum of first gaster segment entirely or mostly covered with longitudinal rugae ..... *longibarbis* (in part) (Argentina, Bolivia) L = 6.0–7.0 mm

11. a. metasternal flanges very large (reminiscent of some *Ephebomyrmex* species), head and gaster orange, alitrunk black, basal face of propodeum in profile almost horizontal, rugae covering dorsum of first gaster segment .... *rastratus* (Argentina) L = 6.0–7.8 mm

b. lacking above character combination 12

12. a. antenna scape short, in repose not greatly surpassing posterior corner of eye .... *meridionalis* (Argentina) L = 6.5 mm

b. antenna scape long, in repose approaching or exceeding midpoint between corner of eye and occiput 13

13. a. head red or reddish 14

b. head black 15

14. a. ammochaetae of psammophore long .....

longibarbis (in part) (Argentina, Bolivia) L = 6.0–7.0 mm

b. ammochaetae of psammophore short ..... *vermiculatus* (in part) (Argentina, Chile) L = 4.9–7.5 mm

15. a. in full-face view, conspicuous interrugal reticulation covering most of head, head and alitrunk black, gaster orange or red 16

b. in full-face view, any conspicuous interrugal reticulation is confined to posterior half of head ..... *vermiculatus* (in part) (Argentina, Chile) L = 4.9–7.5 mm

16. a. dorsum of first segment of gaster entirely covered by longitudinal rugae ..... *catanlilensis* (Argentina) L = 7.0–8.0 mm

b. dorsum of first segment of gaster without rugae ..... *pronotalis* (Argentina) L = 7.0 mm

17. a. propodeum lacking spines (tubercles at best), rugae or striae present on dorsum of first gaster segment at insertion of postpetiole, basal margin of mandible roughly straight .. *theresiae* (Ecuador) L = 4.5–5.5 mm

b. propodeum with spines, rugae or striae absent from dorsum of first gaster segment, basal margin of mandible at least slightly convex 18

18. a. scapes long, in repose approaching or exceeding midpoint between corner of eye and occiput ..... *lobatus* (Argentina, Brazil, Uruguay) L = 7.5–9.0 mm

b. scapes short, in repose not greatly surpassing posterior corner of eye 19

19. a. metasternal flanges in profile poorly developed, inconspicuous or absent 20

b. metasternal flanges in profile conspicuous, more typical of the genus 21

20. a. scape base with conspicuous depression or trough, femur of foreleg weakly incrassate at best, propodeal spines without connecting keel, worker caste strongly polymorphic with big-headed majors ..... *coarctatus* (Argentina, Uruguay) L = 7.5–12.0 mm (including major)

b. scape base trough absent or weak, femur of foreleg strongly incrassate, propodeal spines with connecting keel, worker caste weakly polymorphic ..... *bruchi* (Argentina) L = 7.2–9.0 mm

21. a. occipital corners with conspicuous rugae or striae, lateral clypeal projections only moderately developed .... *micans* (Argentina, Brazil) L = 6.5–8.0 mm

b. occipital corners without conspicuous rugae or striae, lateral clypeal projections strongly developed ....*marcusi* (Bolivia) L = 7.0–9.0 mm

Appendix 4

A New Harvester Ant

When a new species is discovered, its description must be formal and technical. Almost nothing is known about the biology of this new harvester ant except that it lives in the sand dunes of Baja California. See figures A4.1, A4.2, and A4.3.

Pogonomyrmex snellingi Taber new species

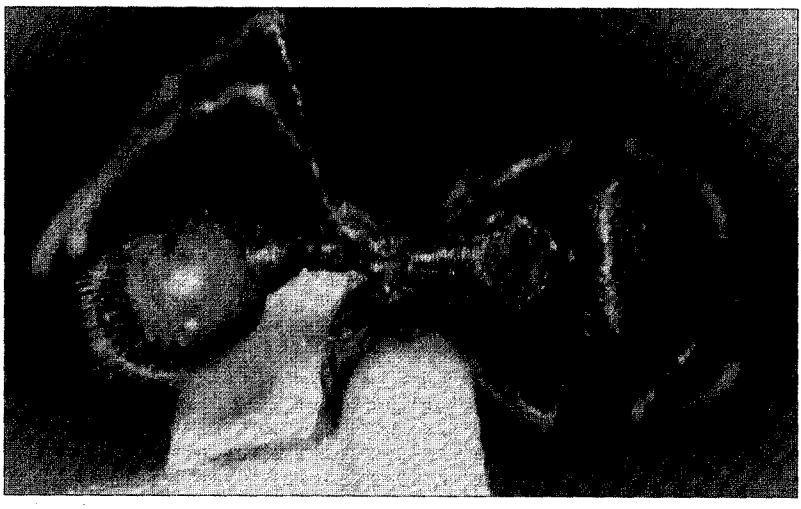
1. Distribution: Mexico
2. Habitat preference: sand dunes at 0–8 m elevation
3. Type material: this species is known from six workers collected by Roy R. Snelling, for whom it is named

Description

The jaws of this species are so distinctive that the insect can be described as the most unusual member of its genus in North America. Nothing is known of the biology of this myrmicine ant except that six workers were collected in 1977 among sand dunes at low elevation in Baja California. It has been kept in the Los Angeles County Natural History Museum (LACNHM).

The description of the new species follows the terminology and abbreviations of Cole (1968), with modifications by Snelling (1981):

A4.1 A new harvester ant species. Pogonomyrmex snellingi *of Baja California, in lateral view (worker).*



A4.2 Snelling's harvester in dorsal view (worker).

CI (cephalic index) = (HW [head width])(100/HL [head length])
EL (eye length) = maximum length of compound eye in lateral view
EW (eye width) = maximum width of compound eye in lateral view
HL = length of head in full-face view, from occiput to anteriormost tip of clypeus
HW = maximum width of head in full-face view, excluding the eyes

A4.3 The unique jaws of Snelling's harvester. They look much like those of Hylomyrma *and are perhaps a throwback or atavism of evolution.*

OI (ocular index) = (EL)(100/HL)
PNL (petiolar node length) = length of the node of the petiole in lateral view
PNW (petiolar node width) = maximum width of petiole node in dorsal view
PPL (postpetiole length) = maximum length of postpetiole in dorsal view
PPW (postpetiole width) = maximum width of postpetiole in dorsal view
SI (antenna scape index) = (SL)(100/HW)
SL (antenna scape length) = maximum length of scape, exclusive of condyle
WL (Weber's length) = length of alitrunk in lateral view, from the anterior declivity of the pronotum to the tip of the metasternal lobe

HOLOTYPE (worker caste): Mexico, Baja California, 8 km N Guerrero Negro, altitude 0–8 m; sand dunes, 24 August 1977, R. Snelling (collector) (Holotype location and designation: LACNHM Taber/1).

DESCRIPTION: CI 114.3, EL 0.46 mm, EW 0.28 mm, HL 1.47 mm, HW 1.68 mm, OI 31, PNL 0.49 mm, PNW 0.35 mm, PPL 0.49 mm, PPW 0.60 mm, SI 75, SL 1.26 mm, WL 1.82 mm.

Mandible with seven teeth; apical tooth longest; subapical about equal in length to first basal; second basal (middle tooth) half or less than half the length of first basal; third basal a little longer than subapical and first basal; penultimate tooth length less than or equal to second basal; ultimate tooth strongly offset, about equal in length to subapical, separated from penultimate tooth by a large gap; basal margin of mandible short and almost straight. Dentary margin of mandible not transverse as in all congeners, but oblique, as in *Hylomyrma* Forel. Base of antenna moderately developed, but rather large for a member of the *P. californicus* species complex; basal flange thin; lip weak and curved distad; point weak. Longitudinal cephalic rugae diverging from frontal lobes to occiput, coarseness and spacing of cephalic rugae moderate in comparison with the extremes displayed within the genus; interrugal areolation distinct but not presenting a beaded appearance; circumocular whorls present (common feature in *P. californicus* complex); in lateral view, eye situated approximately in the center of the side of the head; frontal area shallow; lateral lobe of clypeus without projection below antenna fossa. Mesopropodeal depression weak, propodeum with small tubercles, but no spines; rugae of thoracic dorsum coarse, interrugal spaces shining; apex of petiolar node rounded, nipple absent; ventral process of anterior peduncle of petiole weak, the process lacking setae (setae present in *P. barbatus* species complex); ventral process of postpetiole node weak; dorsal rugae of petiolar node sparse and confined to posterior half, surface of node shagreened; a very few rugae on dorsum of postpetiolar node, these confined to extreme posterior of node, the surface of the node shagreened. Dorsum of gaster very lightly shagreened. Setae of head, alitrunk and gaster coarse and clear; psammophore well developed. Body color dark reddish brown.

PARATYPES (worker caste): Five specimens, with same collection data as holotype (location and designation of paratypes: LACNHM Taber/2, Taber/3; MCZ [Museum of Comparative Zoology (Harvard)] Taber/4; USNM [United States National Museum] Taber/5; personal collection of the author Taber/6).

VARIATIONS IN PARATYPE SERIES: CI 100.0–119.0, EL 0.35–0.42 mm, EW 0.25–0.28 mm, HL 1.47–1.65 mm, HW 1.65–

1.75 mm, OI 23.4–26.7, PNL 0.46–0.53 mm, PNW 0.35–0.39 mm, PPL 0.42–0.49 mm, PPW 0.56–0.63 mm, SI 62.7–65.2, SL 1.05–1.12 mm, WL 1.75–1.89 mm.

The propodeal armature varies from very short spines to a complete absence of either spines or tubercles. The paratypes are otherwise similar to the holotype.

DIAGNOSIS: The oblique dentary margin of the mandible (similar to that of *Hylomyrma* Forel) is sufficient for the identification of this species, as all congeners have a roughly transverse margin. Furthermore, no other *Pogonomyrmex* species has the following combination of characters: distinct gap between the ultimate and penultimate mandibular teeth, offset ultimate tooth, short basal mandibular margin, and circumocular whorls. The oblique dentary margin and the presence of circumocular whorls readily distinguish this ant from both *Pogonomyrmex apache* Wheeler and *Pogonomyrmex occidentalis* (Cresson).

DISTRIBUTION: Known only from the type locality.

ETYMOLOGY OF SPECIFIC EPITHET: The new species is dedicated to Roy R. Snelling, accomplished hymenopterist and collector of the ant named in his honor.

DISCUSSION: *Pogonomyrmex snellingi* belongs to the *P. californicus* species complex and is most closely related to *Pogonomyrmex comanche* Wheeler. The species appear as sister taxa in the phylogeny of the genus, sharing as synapomorphies a basal mandibular tooth that is at least slightly offset, and only a moderate amount of areolation on the dorsum of the petiolar node. The dorsum of this node is flattened in *P. comanche* but it is not flattened in *P. snellingi.* Both species occur only in sand, but the distributions of these two ants are widely separated.