

**THE TAXONOMY OF NEIVAMYRMEX TEXANUS,  
N. SP., N. NIGRESCENS AND N. CALIFORNICUS  
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DISTRIBUTION MAP AND KEYS  
TO THE SPECIES OF  
NEIVAMYRMEX OF  
THE UNITED STATES**

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ABSTRACT

A list of species and known castes, distribution map and keys to species of major workers, queens and males of *Neivamyrmex* from the United States are presented. Included are original descriptions of the worker and queen of *Neivamyrmex texanus*, n. sp., and the queen of *N. californicus* (Mayr); and a revised description of the male of *N. nigrescens* (Cresson). Distinctive characteristics, variations, and geographical records are given for the above three species.

INTRODUCTION

The male, *Labidus nigrescens* (= *Neivamyrmex nigrescens*), was described by Cresson (1872) from a specimen collected in Bosque Co., Texas, by G. W. Belfrage. The worker, *Eciton (Acamatus) schmitti* (= *Neivamyrmex nigrescens*), collected from Doniphan, Missouri, was listed in a key in 1894, and a brief description was given in 1895 by C. Emery. Males (collected with workers) were described as *Eciton schmitti* (= *Neivamyrmex texanus*, n. sp.) by Wheeler and Long (1901) from specimens collected near Mt. Bonnel, a few miles from Austin, Texas. Wheeler sent some of these bicolored males to Fox, who compared them with Cresson's type, and said they were different: "too hairy for *nigrescens*, which is entirely brownish." M. R. Smith (1938) synonymized Emery's *schmitti* with Cresson's *nigrescens*, and later (1942) incorrectly included the specimens collected by Wheeler and Long from Mt. Bonnel under *nigrescens*. Borgmeier (1955) redescribed the male from the Mt. Bonnel Collection as *N. nigrescens*.

The primary purpose of this paper is to separate *Neivamyrmex texanus*, n. sp., from *N. nigrescens* (Cresson 1872), and to elucidate the relation of *N. californicus* (Mayr 1870) to the latter species. Since I have not been able to determine which of the above forms of "*N. nigrescens*" are referred to by some authors, I have listed only those taxonomic references which I can clearly assign to one or the other. A more complete listing is given in Borgmeier (1955:494). Also, as several new species, castes and geographical records have been reported

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since Smith (1942); new keys, list of species and known castes, and a distribution map of the species of *Neivamyrmex* from the United States are included.

#### ACKNOWLEDGMENTS

This manuscript was reviewed and valuable suggestions were made by Carl W. Rettenmeyer, Univ. of Connecticut; David R. Smith, U. S. Dept. of Agri.; Robert S. Baldrige, Kansas State Univ.; and Harley W. Reno, Baylor Univ. Figures 23-32, 40-48, 54-56, and 64 were redrawn from Borgmeier (1955), after most were compared with actual specimens.

Specimens for this study were generously provided by David R. Smith, Systematic Entomology Laboratory, U. S. Department of Agriculture, U. S. National Museum (USNM), Washington, D. C.; Jerome G. Rozen, Jr., American Museum of Natural History (AMNH), New York; Howard E. Evans and Richard E. Morel, Museum of Comparative Zoology (MCZ), Harvard University, Cambridge, Mass.; Roy R. Snelling, Los Angeles County Museum of Natural History (LACM), Los Angeles, Calif.; H. R. Roberts and Paulette Jones, Academy of Natural Sciences (PANS), Philadelphia, Penn.; Vincent D. Roth, Southwestern Research Station (SWRS), Portal, Arizona; H. D. Blocker, Entomology Department, Kansas State University (KSU), Manhattan, Kansas; Walter W. Kempf, Borgmeier's Collection (BC), Sao Paulo, Brazil; and Carl W. Rettenmeyer (CWR), University of Connecticut, Storrs, Conn. Additional specimens were from the author's personal collection (JFW), Baylor University, Waco, Texas; and the collection of Robert S. Baldrige (RSB), Kansas State University, Manhattan, Kansas.

#### TERMINOLOGY

The terminology for the male genitalia is from Wheeler (1910:29, 40, Fig. 19). Alitrunk includes the three segments of the thorax plus the fused propodeum.

Key to species of major workers of *Neivamyrmex* from the United States

1. a. Head and gaster brownish black to black ..... 2
- b. Head and gaster dark reddish brown to yellow ..... 3
2. a. Alitrunk same color as head and gaster, smooth and shining, except mesopleura, metapleura and mesopropodeal constriction; petiole with a large acute ventral spine directed posteroventrad ..... *pilosus*
- b. Alitrunk lighter in color than head and gaster, strongly sculptured; petiole with a small ventral slightly acute protuberance directed ventrad ..... *melanocephalus*
3. a. Petiole, from above, distinctly longer than broad (Figs. 2, 5, 8); (caution: petiole of *rugulosus* may sometimes seem

TABLE 1. Species and known castes of *Neivamyrmex* from the United States. (Known caste indicated by ×)

Species	Worker	Queen	Male
<i>agilis</i> Borgmeier <sup>1</sup>	×	—	—
<i>andrei</i> (Emery)	—	—	×
<i>californicus</i> (Mayr)	×	×	—
<i>carolinensis</i> (Emery)	×	×	×
<i>fallax</i> Borgmeier	×	—	—
<i>fuscipennis</i> (Wheeler)	—	—	×
<i>harrisi</i> (Haldeman)	×	×	×
<i>leonardi</i> (Wheeler)	×	—	—
<i>melanocephalus</i> (Emery)	×	—	—
<i>melsheimeri</i> (Haldeman)	—	—	×
<i>microps</i> Borgmeier	—	—	×
<i>minor</i> (Cresson)	—	—	×
<i>mojave</i> (M. R. Smith)	—	—	×
<i>moseri</i> Watkins	×	×	—
<i>nigrescens</i> (Cresson)	×	×	×
<i>opacithorax</i> (Emery)	×	×	×
<i>pauxillus</i> (Wheeler)	×	×	—
<i>pilosus mexicanus</i> (F. Smith)	×	×	×
<i>pilosus mandibularis</i> (M. R. Smith)	—	—	×
<i>rugulosus</i> Borgmeier <sup>2</sup>	×	—	—
<i>swainsoni</i> (Shuckard)	—	—	×
<i>texanus</i> Watkins	×	×	×

<sup>1</sup> Collected by R. Snelling, 15 Aug. 1967, near Paradise, Cochise Co., Arizona. First record from the United States.

<sup>2</sup> Collected by V. Roth, 6 Sept. 1970, and J. F. Watkins II, 14 Aug. 1971, in Cave Creek Canyon, Chiricahua Mts., Cochise Co., Arizona. First records from the United States.

- to be subquadrate, but is always definitely longer than broad) ..... 4
- b. Petiole, from above, subquadrate, robust, sometimes slightly longer than broad (Fig. 53) ..... 9
4. a. Head smooth or weakly reticulated ..... 5
- b. Head densely granulated and often rugose ..... 7
5. a. Basal margin of mandible joining the cutting margin in a convex arc (Fig. 59) ..... *californicus*
- b. Basal margin of mandible straight and forming an acute angle with the cutting margin, usually with a small tooth at the corner (Fig. 60) ..... 6
6. a. Dorsal surface of promesonotum rugose; eye distinct at 10× and located on upper one-half to two-thirds of head; broad geographical range ..... *opacithorax*
- b. Dorsal surface of promesonotum smooth; eye somewhat indistinct at 10× and located about midway of head length; known only from southern Arizona (Cochise County), and Mexico ..... *agilis*

7. a. Basal margin of mandible straight and forming an acute angle with the cutting margin; petiole broad ..... *rugulosus*  
 b. Basal margin of mandible joining the cutting margin in a convex arc; petiole narrow ..... 8
8. a. Basal and sloping surfaces of propodeum joining in an acute angle (Fig. 3) ..... **texanus**  
 b. Basal and sloping surfaces of propodeum joining in a convex arc (Fig. 6) ..... *nigrescens*
9. a. Broad lamella in front of antennal fossa ..... 10  
 b. Lamella in front of antennal fossa narrow or absent ..... 11
10. a. Posterodorsal corners of head forming distinct angular projections when viewed from the front; eyes distinct with convex corneas; major workers 4-5 mm in length ..... *harrisi*  
 b. Posterodorsal corners of head somewhat rounded when viewed from the front; eyes apparently absent, except faint yellowish specks beneath the cuticle of some specimens; major workers 3-4 mm in length ..... *leonardi*
11. a. Eyes absent ..... 12  
 b. Eyes present, although sometimes reduced to indistinct yellowish specks beneath cuticle (*fallax*) ..... 13
12. a. Head shining with sparse small punctations and striations; mandible usually with a basal tooth, plus three or four small teeth and one large apical tooth (Fig. 57) ..... *pauillus*  
 b. Head moderately punctated; mandible usually with a basal tooth, plus two large teeth and a smaller median tooth (Fig. 58) ..... *moseri*
13. a. Head and promesonotum smooth and shining; anteroventral spine of petiole sharp and distinct, projecting posteroventrad; eyes indistinct, reduced to yellowish specks beneath the cuticle ..... *fallax*  
 b. Head and promesonotum densely sculptured; anteroventral projection of petiole somewhat angular, but without a sharp posteroventrally projecting spine; eyes distinct, with raised corneas ..... *carolinensis*

Key to species of *Neivamyrmex* queens from the United States

1. a. Eyes present, although reduced to yellow specks beneath the cuticle of *carolinensis* ..... 2  
 b. Eyes absent ..... 8
2. a. Petiole, from above, trapezoidal (Fig. 54); color reddish black to blackish brown ..... *pilosus*  
 b. Petiole, from above, rectangular or subquadrate (Fig. 12); color reddish brown to yellowish brown ..... 3
3. a. Posterodorsal corners of head, from above, distinctly angular and projecting (Fig. 12) ..... 4  
 b. Posterodorsal corners of head, from above, rounded or not projecting (Figs. 11, 13) ..... 5

4. a. Head and alitrunk densely granulated and/or punctated; promesonotal suture present; petiole slightly wider than long ..... *nigrescens*
- b. Head and alitrunk smooth between scattered punctations; promesonotal suture absent; petiole slightly longer than wide ..... *harrisi*
5. a. Head and promesonotum smooth and shining; eyes indistinct; length (head in hypognathous position, nonphysogastric) less than 10 mm. .... *carolinensis*
- b. Head and promesonotum densely granulated or punctated; eyes distinct; length more than 10 mm ..... 6
6. a. Setae on gastric tergites almost confined to posterior edges; gaster (nonphysogastric) about two and one-half times length of alitrunk ..... *opacithorax*
- b. Setae on gastric tergites scattered over entire surfaces; gaster (nonphysogastric) about two times length of alitrunk ..... 7
7. a. Node of petiole transverse, one and one-half times wider than long (Fig. 11), anterior and dorsal surfaces forming a continuous arc (Fig. 14); frontal ridge not extending below antennal fossa ..... **texanus**
- b. Node of petiole subquadrate, slightly wider than long (Fig. 13), flat dorsal surface (lateral view) forming a rounded corner with anterior surface (Fig. 16); frontal ridge extending below antennal fossa ..... *californicus*
8. a. Mesopropodeal suture, from above, complete; head, in profile, about two times longer than thick; inner margin of mandible convex without teeth ..... *moseri*
- b. Mesopropodeal suture, from above, incomplete; head, in profile, about three times longer than thick; inner margin of mandible with two or more small teeth ..... *pauvillus*

Key to species of *Neivamyrmex* males from the United States

1. a. Mandible sickle-shaped (Fig. 64) ..... 2
- b. Mandible not sickle-shaped (Fig. 19), although narrow and parallel sided in *carolinensis* ..... 8
2. a. Head, from front, with distinct posterior corners visible between the lateral ocelli and compound eyes (Fig. 64) ..... 3
- b. Head, from front, without distinct posterior corners (Fig. 19) ..... 4
3. a. Volsella forked (Fig. 40); body length 9–10 mm ..... *fuscipennis*
- b. Volsella not forked (Fig. 41); body length 7–8 mm ..... *melsheimeri*
4. a. Length more than 10 mm ..... 5
- b. Length less than 10 mm ..... 6

5. a. Diameter of flagellum uniform from second to anteapical segments; apex of stipes with a deep concavity which separates triangular ventral lobe from long rectangular process (Fig. 25) ..... *andrei*
- b. Diameter of flagellum gradually decreases from second to apical segments; apex of stipes somewhat rounded and without a deep concavity (Fig. 26) ..... *swainsoni*
6. a. Distance between lateral ocellus and compound eye less than diameter of median ocellus ..... *minor*
- b. Distance between lateral ocellus and compound eye more than two times diameter of median ocellus ..... 7
7. a. Scape about as long as flagellar segments one through four; stipes with a broad dorsal triangular projection and broadly rounded apex (Fig. 28); known only from Phoenix, Arizona ..... *microps*
- b. Scape about as long as flagellar segments one through three; stipes without a dorsal triangular projection and with a more angular apex (Fig. 29); known only from Mojave Desert, California ..... *mojave*
8. a. Distinct unturned occipital flange present; sloping surface of propodeum with median longitudinal groove ..... 9
- b. Without a distinct upturned occipital flange; sloping surface of propodeum without median longitudinal groove ..... 10
9. a. Mandible longer than scape; inner margin of mandible with a median convex swelling (Fig. 55); stipes with a moderately tall and blunt dorsal projection, and broadly pointed apex (Fig. 31) ..... *pilosus mexicanus*
- b. Mandible about as long as scape; inner margin of mandible without a median convex swelling (Fig. 56); stipes with a short triangular dorsal projection, and blunt apex (Fig. 32) ..... *pilosus mandibularis*
10. a. Ocelli unusually large and on a strongly elevated protuberance, distance between lateral ocellus and compound eye less than diameter of median ocellus ..... *harrisi*
- b. Ocelli small and on a weakly elevated protuberance; distance between lateral ocellus and compound eye at least two times diameter of median ocellus ..... 11
11. a. Apex of stipes with a tall dorsal projection (Figs. 33, 34); length of second submarginal (cubital) cell usually more than 1.4 mm (Fig. 18) ..... **texanus**
- b. Apex of stipes without a tall dorsal projection (Figs. 35-39); length of second submarginal (cubital) cell less than 1.4 mm (Fig. 21) ..... 12
12. a. Mandible narrow, sides almost parallel, not wider in middle than at base; body length 8-10 mm ..... *carolinensis*
- b. Mandible broader, wider in middle than at base; body length 10-13 mm ..... 13



FIG. 1A. Distribution of species of *Neivamyrmex* in the United States: *N. agilis* (1), *N. andrei* (2), *N. californicus* (3), *N. carolinensis* (4), *N. fallax* (5), *N. fuscipennis* (6), *N. harrisi* (7), *N. leonardi* (8), *N. melanocephalus* (9), *N. melsheimeri* (10), *N. microps* (11), *N. minor* (12), *N. mojave* (13), *N. moseri* (14), *N. nigrescens* (15), *N. opacithorax* (16), *N. pauxillus* (17), *N. pilosus mexicanus* (18), *N. pilosus mandibularis* (19), *N. rugulosus* (20), *N. swainsoni* (21), *N. texanus* (22).

13. a. Distinct transverse swelling above antennal fossa; lower half of propleura strongly compressed; head, alitrunk and gaster usually black or dark brown ..... *nigrescens*  
 b. Without a distinct transverse swelling above antennal fossa; lower half of propleura weakly compressed; head and alitrunk black, gaster reddish brown ..... *opacithorax*

*Neivamyrmex texanus* n. sp. ♀ ♂

(Figs. 2-4, 11, 14, 17-19, 33, 34, 49, 61)

*Eciton schmitti*, Wheeler and Long, 1901, Amer. Natur. 35:161, Fig. 1, ♂, Austin, Tex.

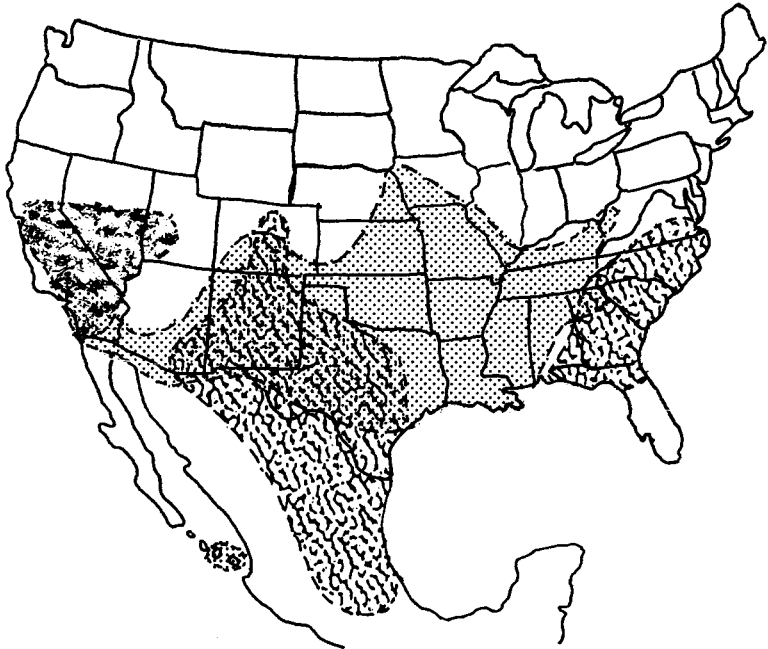
*Eciton (Acamatus) schmitti*, Wheeler, 1908, Bull. Amer. Mus. Natur. Hist. 24:410 (includes *nigrescens*).

*Eciton (Acamatus) nigrescens*, M. R. Smith, 1938, Proc. Entomol. Soc. Wash. 40:157-160 (includes *nigrescens*).

*Eciton (Acamatus) sumichrasti*, Mann, 1926, Psyche 33:99, ♀, Guadaluajara, Jalisco, Mexico.

*Neivamyrmex nigrescens*, Borgmeier, 1955, Stud. Entomol., Nr. 3:496; Pl. 40, Fig. 12; Pl. 50, Figs. 5, 13, 18; Pl. 72, Fig. 2; ♂, Austin, Tex. (The worker described from Laurel, Miss. is *nigrescens*).








**KEY:**  *Neivamyrmex texanus*  
 *N. nigrescens*  
 *N. californicus*

FIG. 1B. Range of *Neivamyrmex texanus*, *N. nigrescens*, and *N. californicus*.

**MAJOR WORKER** (Waco, Texas, colony W-58). Length 5.1 mm. Head (Fig. 4) approximately as long as wide, slightly narrowed posteriorly; median length without mandibles 1.20 mm; greatest width 1.25 mm; sides slightly convex; occipital corners triangular, but not curved outwards. Eyes with distinct corneas. Mandible (Fig. 4) triangular; weakly striated; with a moderately large basal tooth, and with the basal margin curving into the masticatory margin which has three or more small blunt teeth. Antennal fossa with a very weak ridge in front, but with a sharply defined lateral border. Scape widened apically; extending above eye level; length 0.9 mm. Flagellum gradually thickened; length 2.0 mm; segments 3 and 4 approximately as wide as long, 5-10 longer than wide; apical segment two and one-half times longer than wide. Alitrunk (Fig. 3) length 2.1 mm; greatest width 0.8 mm. Pronotum with a prominent transverse ridge on anterior margin, and

a continuous groove near the ventrolateral and posterolateral margins. Promesonotum, in profile, moderately convex. Mesopropodeal indentation strongly impressed. Propodeum with a slightly convex basal surface, and somewhat concave descending surface, which form a distinct corner at their juncture. Petiole (Figs. 2, 3) longer than wide, rectangular, with parallel sides; length 0.6 mm; width 0.4 mm; height 0.45 mm; slightly convex dorsally and more slanted anteriorly; anteroventral projection weak and often covered by the metacoxa. Postpetiole slightly trapezoidal viewed from above, narrowed anteriorly; length 0.45 mm; greatest width 0.5 mm; height 0.5 mm; slightly convex dorsally. Gaster oval and more narrowed posteriorly; length 1.7 mm; greatest width 1.15 mm; greatest height 1.05 mm. Length of meta-femur 1.6 mm, metatibia 1.5 mm. Proximal tarsal segment longer than segments 2-4 combined, segment 4 shortest. Claws without teeth. Head, alitrunk, petiole, and postpetiole thickly granulated and weakly rugate dorsally. Gaster smooth. Setae erect, unequal in length, moderately abundant on all body surfaces. Color dark reddish-brown to blackish-brown, gaster and legs lighter.

QUEEN (Waco, Texas, colony W-157). Nonphysogastric. Length (head in hypognathous position) 10.8 mm. Head (Fig. 61) slightly wider than long with a broad median impression; median length 1.4 mm; greatest width 1.55 mm; sides slightly convex; occipital corners rounded; occipital margin broadly concave. Eyes with distinct convex corneas, located on upper one-third of head. Mandible moderately narrow, slightly thickened about one-third length from base, and gradually tapering apically, with a weakly concave cutting margin. Frontal carinae rounded, with a deep median impression between them, and not extending below antennal fossae. Scape gradually thickened distally, reaching lower eye margin; length 0.9 mm. Flagellum not apically thickened; segment 1 short, 2-10 about equal in diameter, 2 and 3 as wide as long, 4-10 slightly longer than wide; apical segment almost 3 times longer than wide, and two times longer than antepical segment. Alitrunk (Figs. 11, 14) length 3.1 mm; greatest width 1.3 mm at the propodeum; gradually widened posteriorly; without a median longitudinal impression, but with a shallow dorsal concavity on the propodeum. Anterior border of pronotum upturned. Promesonotal suture distinct. Mesopropodeal suture broad and shallow on dorsum. Pronotum with small, but distinct, posterior dorsolateral projections (Fig. 11). Promesonotum, in profile, convex and more strongly sloping anteriorly. Propodeum, in profile, almost flat dorsally and slightly rising posteriorly, with dorsal and sloping surfaces broadly rounded at their juncture. Petiole (Figs. 11, 14) transverse, one and one-half times wider and taller than long; length 0.7 mm; width 1.05 mm; height (including ventral projection) 1.1 mm; dorsal surface with a deep, broad, longitudinal concavity; anterior border, viewed dorsally, almost straight with broadly rounded corners; sides parallel; posterior border slightly concave; anterior and dorsal surfaces, in profile, forming a

continuous arc (Fig. 14); posterior surface slightly concave; anteroventral projection semicircular. Gaster elongate; length 6.2 mm; greatest width 2.4 mm; greatest height 2.0 mm; apical segment strongly tapering with a deep triangular notch in apex of fifth gastric sternite. Length of metafemur 1.6 mm, metatibia 1.5 mm. Proximal tarsal segment two times longer than segment 2, segment 4 shortest. Claws without teeth. Head, alitrunk and petiole finely granulated, and with abundant short, erect setae. Gaster smooth, except for scattered punctations bearing short, appressed setae. Color reddish brown.

MALE (Austin, Texas). Thoroughly described as *Eciton schmitti* by Wheeler and Long (1901:161), and as *Neivamyrmex nigrescens* by Borgmeier (1955:496).

TYPES. Holotype male, length 12.2 mm, red label, collected by W. M. Wheeler, Austin, Texas, U. S. A. ("10-13-00," date on one paratype only) deposited in MCZ. Paratypes, red labels, deposited as follows: 1 (MCZ); 1 (USNM); 1 (LACM); 2, including 1 with two workers on the same pin (AMNH).

TYPE LOCALITY. U. S. A., Texas, Travis County, Austin.

GEOGRAPHICAL DISTRIBUTION (Fig. 1). U. S. A.: south-eastern Arizona, Colorado, northern Florida, Georgia, New Mexico, North Carolina, South Carolina, Texas, Virginia. Mexico: Hidalgo, Jalisco.

#### SPECIMENS STUDIED

##### Workers

U. S. A.: Arizona: Huachuca Mts., 15-XI-1910, W. M. Wheeler (AMNH).

Colorado: Colorado Springs, W. M. Wheeler (AMNH).

Florida: Gainesville, 4-2-46(?), T. H. Hubbell (USNM);

Pensacola, 10-VIII-43, R. M. Lhamon (USNM); Woodville, 4-9-32(?), D. E. Read (USNM).

Georgia: Lumpkin Co., Dahlonega, 17-VII-1953, E. S. Ross (CWR).

New Mexico: Las Vegas, V-1905, W. M. Wheeler (USNM, AMNH).

North Carolina: Black Mts., 24-V-04 (AMNH, USNM); Wilmington, 8-II-32, Vanderford (USNM).

South Carolina: Clemson College, 27-VI-40, J. Berly & M. Smith (USNM).

Texas: Austin, W. M. Wheeler (AMNH, USNM, MCZ); Belton, 21-VII-1968, J. C. Kroll (JFW); 1 mi. west Whitney Dam, 14-IV-1968, R. W. Plsek (JFW); Llano, 25-X-05, A. W. Morrill (USNM); Waco: 1-X-1964, 2-V-1965, 17-VIII-1967, 6-IX-1967, 8-II-1968, 4-VI-1971, J. F. Watkins (JFW); 22-VIII-1965, 21-IX-1966, 8-VIII-1969, 6-II-1970, F. R. Gehlbach (JFW); 24-V-1968, 15-VII-1968, 15-VII-1968, 29-VII-1968, R. W. Plsek (JFW); 16-VII-1968, J. C. Kroll (JFW); 25-VIII-1969, L. Har-

rell (JFW); Victoria Co., Coletto Creek, 11-III-16, J. D. M. (AMNH); Victoria (USNM); Lubbock, 7-X-71, R. S. Baldrige (JFW).

Virginia: Norfolk, 27-VIII-32, Vanderford (USNM); Waywick, 1-15-X-1956, Bond & Coly (USNM).

Mexico: Hidalgo: San Miguel, W. M. Mann (LACM); Guerrero Mill, W. M. Mann (AMNH).

Jalisco: Guadalajara, XII-1923, W. M. Mann (USNM).

#### *Queens*

U. S. A.: Texas: Waco: 2-V-1965, J. F. Watkins (JFW); 6-II-1970, F. R. Gehlbach (JFW); Lubbock, 7-X-71, R. S. Baldrige (JFW).

#### *Males*

U. S. A.: Arizona: Brown Canyon, Baboquivari Mts., 7-IX-1938, Menke & Stange, *atypical specimen* or undescribed form (LACM).

Texas: Austin, 13-X-00 (date on one specimen only), W. M. Wheeler (MCZ, AMNH, USNM, LACM); Waco: 1-X-1964, J. F. Watkins (JFW); 18-X-1969, J. Briga (JFW); 15-XI-1969, Nicholson (JFW).

Virginia: Waywick, 1-15-X-1956, Bond & Coly (USNM).

**DISTINCTIVE CHARACTERISTICS.** *Worker*: Petiole distinctly longer than broad; head, alitrunk, petiole and postpetiole densely granulated; basal and sloping surfaces of propodeum joining in an acute angle; occipital corners usually angular but not curved outwards. *Queen*: Eyes distinct; petiole rectangular, one and one-half times wider than long, with the anterior and dorsal surfaces (in profile) forming one continuous arc; posterodorsal corners of head rounded; head and alitrunk finely granulated; setae scattered over all body surfaces. *Male*: apex of stipes with a tall dorsal projection; ocelli small and widely separated from compound eyes; mandibles not sickle-shaped; head and alitrunk black, gaster rusty-brown.

**VARIATION.** *Workers*: Length 2.5–5.1 mm. Occipital corners usually triangular, but are somewhat rounded in specimens studied from Black Mts., North Carolina. Basal tooth of mandible varies from moderately large to indistinct. Basal and sloping surfaces of propodeum usually form a distinct corner at their juncture, but a few specimens have more rounded propodea, especially those studied from Colorado Springs, Colorado, and Las Vegas, New Mexico. *Queens*: (Two specimens examined). Length (nonphysogastric, head deflected) 9.5–10.8 mm. Head length 1.4–1.6 mm, width 1.55–1.7 mm. Dorsal surface of promesonotum may or may not have a shallow concavity. Mesopropodeal suture broad and shallow or incomplete dorsally. Petiole 1.5–1.6 times wider than long. *Males*: Length (head deflected) 11–13 mm. Dorsal projection of stipes usually angular (Fig. 33), but the projections are truncated in three males studied from Waywick, Virginia (Fig. 34). Setae usually long, semierect, and thickly distributed over

the body, but are short, sparse, and appressed on a few specimens. Borgmeier (1955), in his key to *nigrescens* (= *texanus*) indicated that the terminal branch of the radial wing vein is shorter than the branch to the stigma; however, I found this highly variable—sometimes the terminal branch is longer, sometimes the branch to the stigma is longer, and sometimes the two branches are about equal in length. The length of the second submarginal (cubital) wing cell varies from 2.4 to 3.2 times longer than wide. Wings vary from slightly to strongly infuscated. One male from Brown Canyon, Baboquivari Mts., Arizona, (LACM) is very atypical and could be the undescribed male of *N. rugulosus*. It is unusually small (length 10.2 mm), with a darker gaster (blackish instead of rusty-brown as in all other specimens of this species examined), with more transparent wings, and truncated dorsal projection of the stipes.

*Neivamyrmex nigrescens* (Cresson) ♀ ♀ ♂  
(Figs. 5-7, 12, 15, 20-22, 35-37, 50, 59, 62)

*Labidus nigrescens* Cresson, 1872, Trans. Amer. Entomol. Soc. 4:194, ♂, Bosque County, Tex.; 1887, Trans. Amer. Entomol. Soc. Suppl.: 259.

*Eciton nigrescens*, Dalla Torre, 1893, Cat. Hymen. hucusque desc. Syst. et syn. 7:5.

*Eciton (Labidus) nigrescens*, Emery, 1895, Zool. Jahrb. Syst. 8:261.

*Eciton (Acamatus) nigrescens*, Wheeler, 1908, Bull. Amer. Mus. Natur. Hist. 24:417, Pl. 26, Fig. 7, ♂, Kansas; M. R. Smith, 1938, Proc. Entomol. Soc. Wash. 40:157-160 (includes *texanus*).

*Eciton (Neivamyrmex) nigrescens*, M. R. Smith, 1942, Amer. Midl. Natur. 27:550, Figs. 4, 10, 23, ♀ ♀ ♂ (Variations and specimens studied include *texanus*).

*Eciton sumichrasti*, Wheeler, 1900, Amer. Natur. 34:564, Fig. 2, ♀.

*Eciton (Acamatus) sumichrasti*, Leonard, 1911, Trans. San Diego Soc. Natur. Hist. 1:85-113, ♀, Point Loma, Calif.

*Eciton (Acamatus) schmitti*, Emery, 1894, Bull. Soc. Entomol. Ital. 26:183, ♀, Doniphan, Missouri; 1895, Zool. Jahrb. Syst. 8:258, ♀, Doniphan, Missouri; Wheeler, 1908, Bull. Amer. Mus. Natur. Hist. 24:410 (includes *texanus*).

*Neivamyrmex nigrescens*, Borgmeier, 1955, Stud. Entomol., Nr. 3:494, Pl. 27, Fig. 3, ♀, Laurel, Miss. (specimens studied include *texanus* and *californicus*, the male is *texanus*).

MAJOR WORKER. Adequately described by Borgmeier (1955: 494).

QUEEN. Adequately described by Smith (1942:551-552) and Borgmeier (1955:495), except that the occipital corners are usually somewhat angular and projecting in dorsal view, and only rarely rounded as noted by Borgmeier.

MALE (Waco, Texas, colony W-172). Length (head deflected) 10.7 mm. Head (Fig. 22) length (including ocellar protuberance)

1.1 mm, width (including compound eyes) 1.9 mm. Ocelli small, on a moderately elevated protuberance which is slightly concave between the lateral ocelli. Margin between lateral ocellus and dorsal border of compound eye weakly convex (almost straight), and the distance between the lateral ocellus and dorsal border of compound eye is more than two times the diameter of the median ocellus. Posterior border of occiput not upturned. Anterior border of clypeus slightly concave, but straight in the middle. Frontal carinae sharp anteriorly and rounding into prominent transverse swellings above the antennal fossae. Lateral border of carina concave in middle, and forming a weak ridge below the antennal fossa. Area between carinae deeply impressed with a groove extending to the median ocellus. Mandible moderately broad; inner and outer margins of basal two-thirds almost parallel, slightly broader beyond the middle, then tapering to the apex. Scape short (0.6 mm), almost straight, gradually widened distally. Flagellum long (4.3 mm), weakly tapering distally; segment 1 short, broader than long; segments 2-12 longer than broad, 2-5 broadest, 7-11 two times longer than broad; apical segment two and one-half times longer than broad. Alitrunk (Fig. 20) length 3.8 mm, greatest width 2.4 mm, greatest height 2.7 mm, moderately gibbose anteriorly. Pronotum extends forward above head, and has sharply defined ventrolateral impressions. Scutum, in profile, arched anteriorly and somewhat level posteriorly; from a dorsal view, with a thin median longitudinal ridge extending from the anterior border about one-third the distance to the posterior border, and with two thin lateral longitudinal ridges beginning about one-third the distance from the anterior border and extending to the posterior border. Paraptera well defined. Scutellum, from a dorsal view, narrowed and rounded posteriorly, below which can be seen the rounded metanotum. Posterior margin of propodeum appears truncated without a median groove from a dorsal view, but the sloping surface is concave in profile. Wings (Fig. 21) length (mesowing) 8.2 mm, greatest width 2.3 mm, slightly brownish infuscated, with brown veins. Terminal branch of radial vein longer than branch to stigma. Second submarginal (cubital) cell 2.8 times longer than wide; length 1.2 mm, width 0.425 mm. Metacoxa length 0.7 mm, almost two times length of mesocoxa. Length of metafemur 1.6 mm, metatibia 1.4 mm, metatarsus 2.0 mm. Metatarsal segment 1 longest, longer than 2-4 combined, 4 shortest. Claw curved with a small tooth near center of inner margin. Petiole two and one-half times wider than long; median length 0.6 mm; width 1.5 mm, height 1.0 mm; anterior margin (dorsal view) slightly concave with rounded corners; sides straight; posterior margin concave in middle, with almost square corners; anterior margin (in profile) straight ventrally, then forming a convex arc with dorsal margin; posterior margin straight dorsally and slanted ventrally with rounded posterodorsal corners; ventral surface convex. Gaster elongate; length 6.0 mm, greatest width 2.2 mm, greatest height 2.4 mm. Subgenital plate widened apically, with three teeth, the median tooth short-

est. Stipes (Fig. 35), in profile, broad; ventroapical corner rounded; dorsoapical surface slanted, with a short dorsal triangular projection. Volsella (Fig. 50) dorsally curved, with pointed apex, and not forked. Entire body surface smooth, except for numerous coarse punctations bearing short appressed, yellowish setae. Head, alitrunk, petiole and gaster black, with brownish borders along posterior edges of gastric sclerites.

**TYPES.** Holotype male, length 10.6 mm, type No. 1855 [red label], Tex., in Academy of Natural Sciences, Philadelphia, Pennsylvania, U. S. A.

**TYPE LOCALITY.** Bosque County, Texas, U. S. A.

**GEOGRAPHICAL DISTRIBUTION** (Fig. 1). U. S. A.: Arkansas, Alabama, southern Arizona, southern California, Colorado, northern Georgia, Illinois, Iowa, Kansas, Kentucky, Louisiana, Mississippi, Missouri, eastern Nebraska, New Mexico, Oklahoma, Tennessee, Texas, western West Virginia. MEXICO: northern Sonora; Nayarit (Isla Maria Magdalena, Isla Maria Cleopa).

**SPECIMENS STUDIED.**

*Workers*

U. S. A.: Alabama: Decatur, 31-V-33, Murphree (USNM).

Arizona: Ramsey Canyon, Huachuca Mts., W. M. Mann (AMNH, USNM); Tucson, 16-VIII-1946, R. H. Crandall (LACM); Madera Cyn. Sta., Rita Mts., 1-6-VIII-1965, R. H. Crandall (LACM); Douglas, 4-VII-43, W. W. Jones (USNM); Sta. Catalina Mts., 26-VII-15, M. Chrisman (USNM); Cave Creek Canyon, Chiricahua Mts., 14-VIII-1971, J. F. Watkins (JFW).

California: Eaton Cyn. Park, Los Angeles Co., 3-IX-1965, R. H. Crandall (LACM); Point Loma, San Diego, P. Leonard (AMNH); Perris, X-1939, Mallis-Zschokke-Schwartz (USNM); Millard Canyon, San Gabriel Mts., 15-VIII-1955, R. H. Crandall (LACM).

Colorado: Salida, 4-VII-1906, W. M. Wheeler (AMNH); Salida (USNM); Mesa Verde Natl. Prk., 24-VII-1945, E. V. Gregg (LACM).

Georgia: Commerce, 5-12-32(?), Vanderford (USNM).

Illinois: Quincy, 3-IX-36, T. E. Musselman (USNM).

Iowa: Sioux City, 12-VII-1924, C. N. Ainslie (USNM); Sioux City, 24-VII-40, W. F. Buren (USNM); Little Sioux, 13-VI-1940, W. F. Buren (USNM).

Kansas: Riley Co.: 7-VIII-1961 to 21-IX-1963 (19 colonies), J. F. Watkins, (JFW); 22-VII-1962 to VI-1970 (7 colonies), C. W. Rettenmeyer (CWR); 27-IX-?, 28-IV-?, J. B. Norton (USNM); 24-VI-1939, 1-VI-1939, A. J. Mattis (USNM); Summer, 1930, R. C. Smith (USNM, KSU); 16-VI-1940, 15-VI-1940 (KSU): Douglas Co., Lone Star Lake, 8-VII-1958, J. W. Hanson (CWR): Jef-

- erson Co., 10-V-40 (KSU): Lawrence, K. U. Nat. Hist. Res., 30-VI-55, 4-V-57, 21-VII-1959, C. W. Rettenmeyer (CWR): Onaga, F. F. Crevecoeur (USNM): Sedwick, I, 4-X-1961, A. J. McCurry (CWR): Topeka, 25-IX-1957; H. Hastings (CWR): McPherson, W. Knaus (USNM): Valley Falls, 10-V-40, A. Mattis (USNM): Wichita, III-1927, J. R. Horton (USNM); X-1949 (KSU).
- Louisiana: Alexandria, 30-VII-08, E. S. Tucker (USNM); Baton Rouge, 17-IX-1915, T. H. Jones (USNM); Buras, IX-1913, J. R. Horton (USNM); Crowley, 31-V-'11, C. E. Hood (USNM); De Ridder, 24-VII-1942, Wm. Burren (USNM); Lafayette, 22-VIII-08, E. S. Tucker (USNM); Naomie, 10-IX-1913 (AMNH).
- Mississippi: Agr. Col. M. R. Smith (USNM); Bond, 26-V-32, Murphree (USNM); Landon, Murphree (USNM); Laurel, M. R. Smith (LACM, USNM); Maben, L. C. Murphree (USNM) Starkville, 22-VI-27 M. R. Smith (USNM); Starkville, W. W. Love (USNM); Wiggins, 24-V-33, Murphree (USNM).
- Missouri: Cape Girardeau, 8-12-32(?), D. E. Read (USNM); Columbia, 20-IV-30, 20-IV-30, 22-V-30, M. Talbot (USNM); Doniphan, "type" (AMNH, USNM); Doniphan, Ripley Co., 11-VII-?, Cotype (USNM); Jefferson City, 6-VI-29, A. C. Burrill (USNM); Miller Co., Lake of Ozarks, 17-X-1965, George L. Rotromel (CWR); Poplar Bluff, 15-IX-32, D. E. Read (USNM); S. Missouri, VI-46, A. C. Burrill (USNM).
- New Mexico: Clayton, 9-VII-03 (AMNH); Clayton (USNM).
- Oklahoma: Ponca City, A. C. Burrill (AMNH).
- Tennessee: Athens, 30-VI-32, Murphree (USNM); Clifton, 4-VIII-32, Murphree (USNM); Henderson, 10-VIII-32, Murphree (USNM); Memphis, 22-VIII-32, Murphree (USNM); Nashville, XI-'39, A. R. Laskey (USNM); near Nashville, L. Wesson (USNM).
- Texas: Anderson Co., 10-IV-1970, F. R. Gehlbach (JFW); Austin, W. M. Wheeler (AMNH); Bell Co., Bowmer Ranch, 1-VIII-1965 to 17-V-1971 (8 colonies), J. F. Watkins (JFW); Bosque Co., 9-VI-1968, J. F. Watkins (JFW); Burnet Co., Inks Lake State Park, 26-III-1968, 27-III-1968, J. F. Watkins (JFW); Dallas: 30-X-05, F. C. Bishop (USNM); 17-V-12, Pierce & Schmitte (USNM); 17-V-12, W. D. Pierce (USNM); 1-III-32, Vanderford (USNM); Del Rio, 2-VI-02 (AMNH, USNM); Denton, W. H. Long (AMNH); Ft. Davis, 8-VI-1902 (AMNH); Houston, 23-VII-31, H. C. Millen-



der (USNM); Paris, A. Ruckes (AMNH); Port Lavaca, II-33, McGehee (USNM); 20 mi. S. San Antonio, 1-XI-1942, E. S. Ross (LACM); Travis Co., T. S. N. L., 18-V-1971, J. F. Watkins (JFW); Waco and vicinity, 24-V-1964 to 9-V-1971 (29 colonies), J. F. Watkins (JFW); Willis, J. C. Bridwell (USNM).

West Virginia: W. Columbia, 18-II-33, McGehee (USNM).

Mexico: Nayarit: Isla Maria Cleopha, 30-III-1964, R. R. Snelling (LACM); Isla Maria Magdalena, 23-III-1964, R. R. Snelling (LACM).

Sonora: 5 mi. S. Cananea, 27-VIII-1970, V. Roth (LACM); 37 mi. N. Hermosillo, 12-III-1969, R. R. Snelling (LACM).

### *Queens*

U. S. A.: Kansas: Lawrence, K. U. Nat. Hist. Res., 30-VI-1955, C. W. Rettenmeyer (CWR); Riley Co., 2-VII-1962, 23-VII-1962, 17-VII-1963, 21-VIII-1963, 21-IX-1963, J. F. Watkins (JFW).

Louisiana: Tallulah, 11-10-31(?), McGehee (USNM).

Mississippi: Starkville, W. W. Love (USNM); Starkville, M. R. Smith (USNM).

Texas: Bosque Co., Valley Mills, 9-VI-1968, J. F. Watkins (JFW); Burnet Co., Inks Lake State Park, 26-III-1968, 27-III-1968, J. F. Watkins (JFW); Houston, 23-VII-31, H. C. Millender (USNM); Waco, 12-IV-1965, 5-VI-1968, J. F. Watkins (JFW); McLennan Co., Nix-Sims Ranch, 20-III-1969, J. F. Watkins (JFW); Travis Co., 22-II-1902, McNeil (AMNH); Willis, 11-III-1903, Bridwell (USNM).

### *Males*

U. S. A.: Alabama: Birmingham, 21-X-40, R. D. Jordan (USNM); Florence, 9-11-30(?), Mrs. F. Moore (USNM).

Arizona: Pinal Mts., 16-VIII-32, R. A. Flock (USNM); S.W.R.S., Cochise Co., 22-VIII-1968 (SWRS).

Arkansas: Pulaski Co., IX-1954 (USNM).

Illinois: Quincy, 3-IX-36, T. E. Musselman (USNM).

Kansas: Riley Co.: 27-IX-?; J. B. Norton (USNM); Sept., F. Marlatt (USNM, KSU); 19-IX-1963, N. Marston (CWR); 21-VIII-1963 (larvae), 29-VIII-1963, J. F. Watkins (JFW); Sedwick, 1-X-1961, 4-X-1961, Mrs. A. J. McCurray (CWR); Wichita, X-1949 (KSU).

Kentucky: Albany, 7-X-55 (USNM).

Missouri: Columbia, 13-X-43, L. Haseman (USNM).

Tennessee: Nashville, XI-39, A. R. Laskey (USNM); Nashville, L. Wesson (USNM).

Texas: Type No. 1855 (Bosque Co., G. W. Belfrage—not on label) (PANS); Dallas, 22-IX-1955, E. W. Laake

(USNM); Waco, 21-X-1970, J. F. Watkins, R. S. Baldrige (JFW, RSB, LACM, CWR, AMNH, USNM, KSU, MCZ).

**DISTINCTIVE CHARACTERISTICS.** *Worker.* Petiole distinctly longer than broad; head, alitrunk, petiole and postpetiole densely granulated; basal and sloping surfaces of propodeum rounded at their juncture; occipital corners angular and often curved outwards. *Queen.* Eyes distinct; petiole subquadrate, only slightly broader than long, with perpendicular anterior surface (in profile) which forms a rounded corner with the level dorsal surface; posterodorsal corners of head usually strongly projecting; head and alitrunk granulated; setae scattered over all body surfaces. *Male.* Stipes (in profile) broad, with a low triangular dorsoapical projection; ocelli moderate in size, and widely separated from compound eyes; mandibles not sickle-shaped; entire body usually blackish.

**VARIATIONS.** *Workers.* Length (defected head) 3.0–5.5 mm. Occipital corners usually angular and projecting, but sometimes are only slightly angular and not projecting. Occipital projections may or may not be turned outwards. Although usually absent, a low basal tooth is present on the mandible of some majors. Most *nigrescens* have strongly granulated heads and alitrunks, but specimens from California are extremely variable in sculpture, varying from strongly granulated to almost smooth, sometimes within the same colony; therefore, some California specimens cannot be separated from *californicus*. Three workers examined from Perris, California, have unusually long petioles, but otherwise resemble typical *nigrescens*. *Queens.* Length (non-physogastric, head more or less deflected) 11–14 mm. The 18 specimens examined are surprisingly uniform in structure. Although the posterodorsal corners of the heads are usually strongly projecting, they occasionally project only slightly and may be angular or somewhat rounded. *Males.* Length 10–13 mm. Entire body usually blackish, but a few specimens have reddish-brown gasters. Although the holotype was described as “black” by Cresson (1872), it now has a reddish tinge, perhaps due to ageing. The wings vary from hyaline to brownish infuscated. The second submarginal cell varies from 2.0 to 2.8 times longer than wide. The setae are usually short and closely appressed on the gasters, but sometimes are moderately long and semierect. The posterior border of scutellum (dorsal view) usually rounded, but sometimes has a weak groove, and rarely a deep notch. The shapes of the stipes vary in details, but the general shapes are usually similar; a specimen from Quincy, Illinois, has the dorsoapical projection somewhat taller than usual.

*Neivamyrmex californicus* (Mayr) ♀♀  
(Figs. 8–10, 13, 16, 63)

*Eciton californicum* Mayr, 1870, Verh. z.b. Ges. Wien 20:969, ♀, San Francisco, Calif.; 1886, Wien Ent. ztg. 5:121; Forel, 1899, Biol. Centr. Amer. Hym. 3:28.

*Eciton (Acamatus) californicum*, Emery, 1894, Bull. Soc. Ent. Ital. 26:184; 1895, Zool. Jahrb. Syst. 8:259; 1900, Mem. Acc. Bologna 8:523; 1910, Genera Insect., Fasc. 102:24; Mallis, 1941, Bull. S. Calif. Ac. Sci. 40:62.

*Eciton (Acamatus) californicum* var. *obscura* Forel, 1914, Bull. Soc. Vaud. Sci. Nat. 50:265, ♀, Vista, Calif.

*Eciton (Neivamyrmex) californicum*, Creighton, 1950, Bull. Mus. Com. Zool. 104:70.

*Neivamyrmex californicus*, Borgmeier, 1953, Stud. Entomol., Nr. 2:11; 1955, Stud. Entomol., Nr. 3:517, Pl. 33, Fig. 3, ♀.

MAJOR WORKER. Adequately described by Borgmeier (1955: 517), except the sculpture is highly variable. See VARIATIONS below.

QUEEN (Davis, Calif.). Nonphysogastric. Length (head not deflected) 11.1 mm. Head (Fig. 63) slightly wider than long, narrowed posteriorly; median length 1.6 mm; greatest width 1.7 mm; sides convex; occipital corners rounded, and not projecting; occipital margin somewhat broadly "V" shaped, with concave middle. Eyes with distinct convex corneas, located near upper one-third of head. Inner margin of mandible strongly convex near middle, then gradually tapering to a sharp apex. Cutting margin of left mandible smooth, and of right mandible with irregular teeth. Frontal carinae rounded, with a deep median impression between them, and extending below antennal fossae. Scape thickened distally; length 0.9 mm. Flagellum not apically thickened; length 2.3 mm; segment 1 shortest, about as long as wide; 2-5 slightly longer than wide; 6-7 as long as wide; 8-10 slightly longer than wide; apical segment 3 times longer than wide, gradually tapering toward apex, and more than 2 times length of antepical segment. Alitrunk (Figs. 13, 16) length 3.2 mm; greatest width 1.2 mm at base of propodeum. Promesonotum rounded without a median impression from a dorsal view. Propodeum somewhat flattened, with a median longitudinal groove. Pronotum strongly narrowed anteriorly. Base of propodeum only slightly wider than mesonotum. Promesonotal and mesopropodeal sutures distinct. Promesonotum, in profile, convex and sloping anteriorly. Mesonotum and propodeum almost flat in profile. Dorsal surface of propodeum, in profile, more than 2 times length of sloping surface which forms a 45 degree angle with the dorsal surface at the mid-line. Petiole (Fig. 13, 16) subquadrate, slightly wider than long, and elevated above the alitrunk; length 0.85 mm; width 1.0 mm; height (including ventral projection) 1.1 mm; dorsal surface with a broad, shallow, longitudinal concavity; anterior, posterior and lateral borders, viewed dorsally, almost straight with rounded corners; flat dorsal surface, in profile, forming a rounded corner with perpendicular anterior surface (Fig. 16); posterior surface of node perpendicular and forming a square corner with the dorsal surface; anteroventral projection large, somewhat conical with a broadly rounded apex. Gaster elongate; length 5.6 mm; greatest width 2.4 mm; apical segment gradually tapering with a deep, broad, triangular notch in apex of fifth gastric

sternite. Length of metacoxa 0.7 mm, narrower and slightly longer than pro- and mesocoxae; length of metafemur 1.4 mm, metatibia 1.4 mm, metatarsus 2.5 mm. Proximal tarsal segment 2 times length of segment 2; segment 4 shortest. Claws without teeth. Head, alitrunk and petiole very finely granulated between numerous coarse, shallow punctations which bear short, erect setae. Gaster smooth, except for scattered punctations bearing appressed setae which are more than two times length of setae on head and alitrunk. Color reddish brown with blackish mottling, especially on the gaster.

MALE. Unknown. Borgmeier (1955:531) suggested that the three specimens which he described as "*Neivamyrmex* species c" were probably the males of *N. californicus*; however, I believe they could just as easily be variants of *N. opacithorax*. The specimen from Pasadena, California, is almost identical to two specimens which I have considered *N. opacithorax*, from Waco, Texas. The two specimens from Baja, California, described by Borgmeier are somewhat more different from the typical *N. opacithorax*, especially the genitalia.

TYPES. Syntype workers deposited in Natural History Museums of Vienna, Austria; Geneva, Switzerland; Genoa, Italy; London, England; and Borgmeier's Collection, Sao Paulo, Brazil (red label "cotype").

TYPE LOCALITY. San Francisco, California, U. S. A.

GEOGRAPHICAL DISTRIBUTION (Fig. 1). U. S. A.: California, Nevada, Utah.

SPECIMENS STUDIED.

#### *Workers*

U. S. A.: California: Arcadia (USNM); Davis, 15-IV-1936, J. J. du Bois (LACM), 1939, VII-36, A. Mallis (USNM); La Jolla (USNM); La Verne, 26-VIII-1931, A. C. Oberle (MCZ, USNM); Los Angeles, 18-IV-39, A. Mallis, 15-VI-42, A. Mallis & J. Swartz (USNM); Natl. City, 7-VI-1959, K. Ross (USNM); Paraiso Spg. (USNM); San Francisco, Schaufuss (BC); Vista, 24-IV-09 (USNM); Nice-Bartlett Spgs., Lake Co., V-1967, A. Andres Falvy (LACM); Camp Pendleton, San Diego Co., 16-VII-1971, J. H. Hunt (LACM).  
Utah: White Valley, Millard Co., 27-V-40, R. W. Fautin (USNM).

#### *Queen*

U. S. A.: California: Davis, 1939, A. Mallis (USNM).

DISTINCTIVE CHARACTERISTICS. *Worker*. Petiole distinctly longer than broad; head smooth or weakly reticulated; basal margin of mandible joining the cutting margin in a convex arc. *Queen*. Eyes distinct; petiole subquadrate, slightly broader than long, perpendicular anterior surface (in profile) forming a rounded corner with flat dorsal surface; posterodorsal corners of head rounded and not projecting; head

and alitrunk very finely granulated; setae scattered over entire surface of gastric tergites; frontal carinae extending in front of antennal fossae.

**VARIATIONS.** *Workers.* Length (deflected head) 2.4–5.0 mm. Occipital corners vary from broadly rounded to slightly angular. Petioles vary from 1.3 to 1.8 times longer than wide. Although the petioles are usually similar in shape to those of *nigrescens*, one large worker (5.0 mm long) from La Jolla, Calif. (USNM) has an unusually broad petiole. The sculpture of the heads varies from smooth to thickly reticulated. The sides of the pronotum and mesonotum may be smooth, weakly reticulated, or deeply reticulated, with some granular areas; most of the reticular impressions are usually somewhat elongate oval. Some workers examined appear to be intermediate between *californicus* and *nigrescens*, but workers of both species can be separated from *opacithorax* by the shapes of the mandibles. *Queens.* (Known from only one specimen.)

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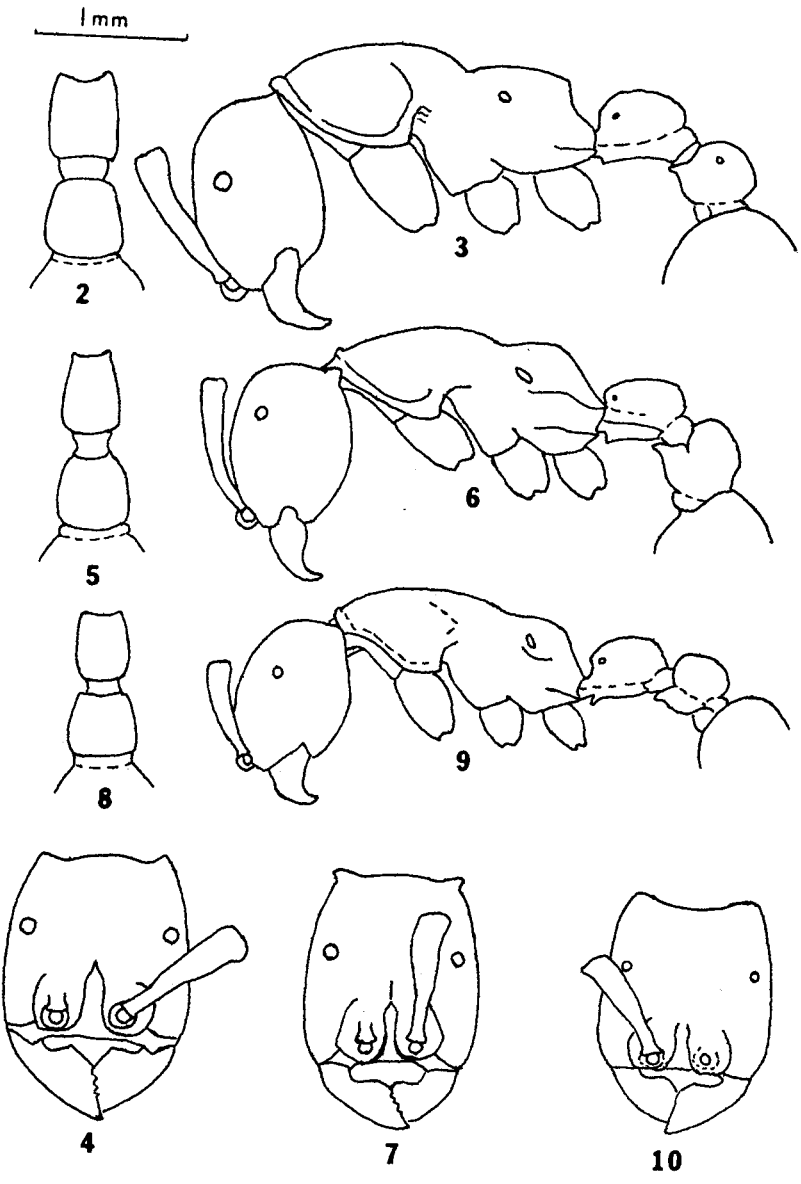
FIGS. 2–10, major workers of *Neivamyrmex*: 2–4, *N. texanus*; 5–7, *N. nigrescens*; 8–10, *N. californicus*.

FIGS. 11–16, queens of *Neivamyrmex*: 11, 14, *N. texanus*; 12, 15, *N. nigrescens*; 13, 16, *N. californicus*.

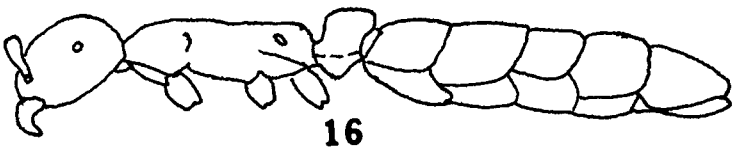
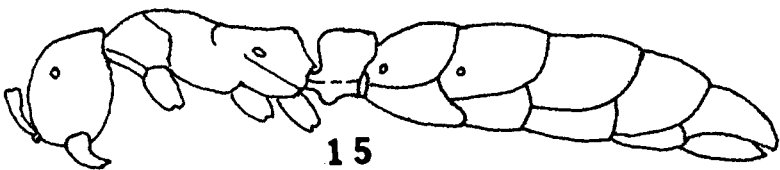
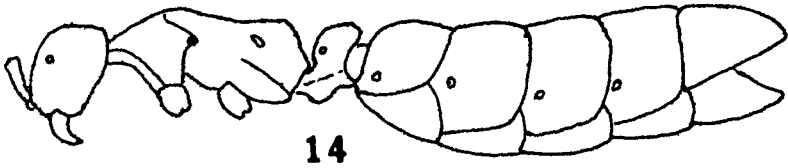
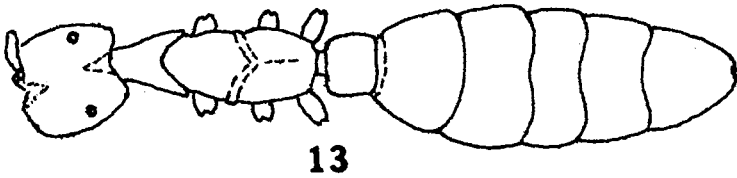
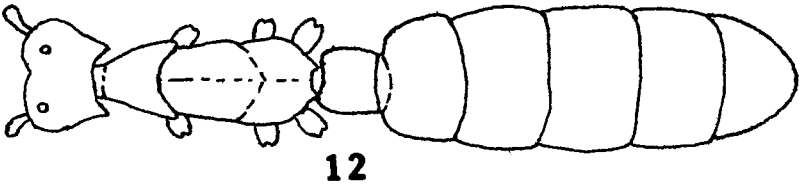
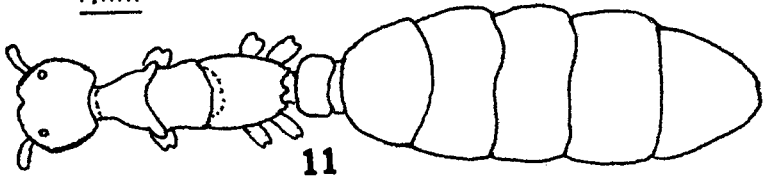
FIGS. 17–22, males of *Neivamyrmex*: 17–19, *N. texanus*; 20–22, *N. nigrescens*.

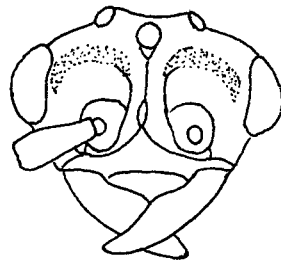
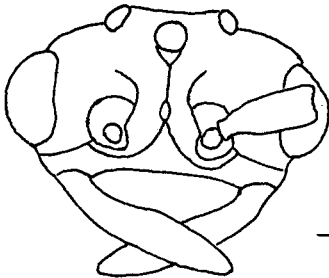
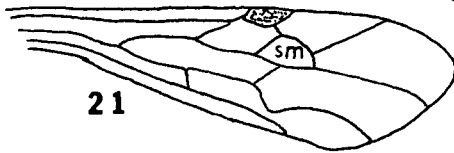
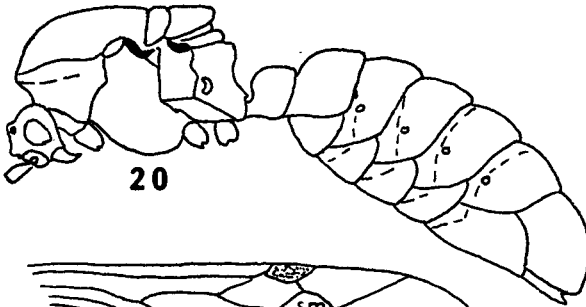
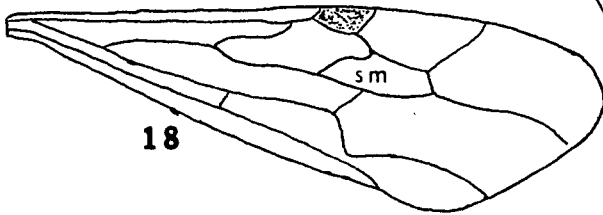
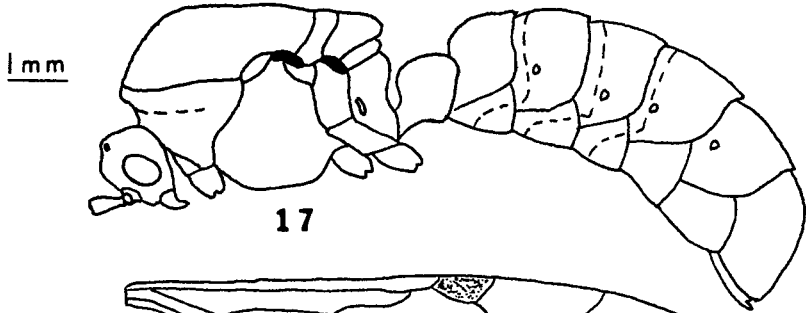
FIGS. 23–38, stipples of *Neivamyrmex* males: 23, *N. fuscipennis*; 24, *N. melsheimeri*; 25, *N. andrei*; 26, *N. swainsoni*; 27, *N. minor*; 28, *N. microps*; 29, *N. mojave*; 30, *N. harrisi*; 31, *N. pilosus mexicanus*; 32, *N. pilosus mandibularis*; 33, 34, *N. texanus*; 35–37, *N. nigrescens*; 38, *N. opacithorax*.

FIG. 39, stipes of *N. carolinensis* male. FIGS. 40–52, volsellae of *Neivamyrmex* males: 40, *N. fuscipennis*; 41, *N. melsheimeri*; 42, *N. andrei*; 43, *N. swainsoni*; 44, *N. minor*; 45, *N. mojave*; 46, *N. pilosus mexicanus*; 47, *N. pilosus mandibularis*; 48, *N. harrisi*; 49, *N. texanus*; 50, *N. nigrescens*; 51, *N. opacithorax*; 52, *N. carolinensis*. FIG. 53, petiole and postpetiole of *N. harrisi* worker. FIG. 54, petiole of *N. pilosus* queen. FIGS. 55–60, mandibles: 55, *N. pilosus mexicanus* male; 56, *N. pilosus mandibularis* male; 57, *N. pauxillus* worker; 58, *N. moseri* worker; 59, *N. nigrescens* worker; 60, *N. opacithorax* worker. FIGS. 61–63, heads of *Neivamyrmex* queens: 61, *N. texanus*; 62, *N. nigrescens*; 63, *N. californicus*.



1mm



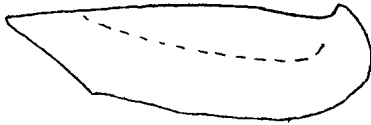


1 mm

19

22

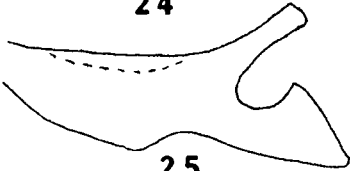




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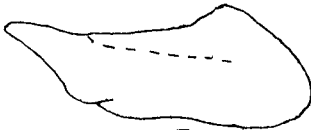
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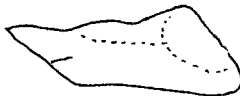
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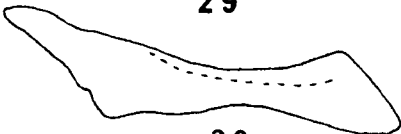
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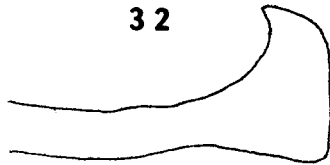
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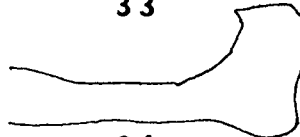
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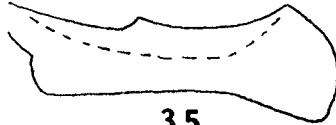
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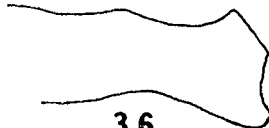
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34



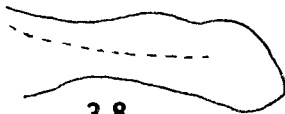
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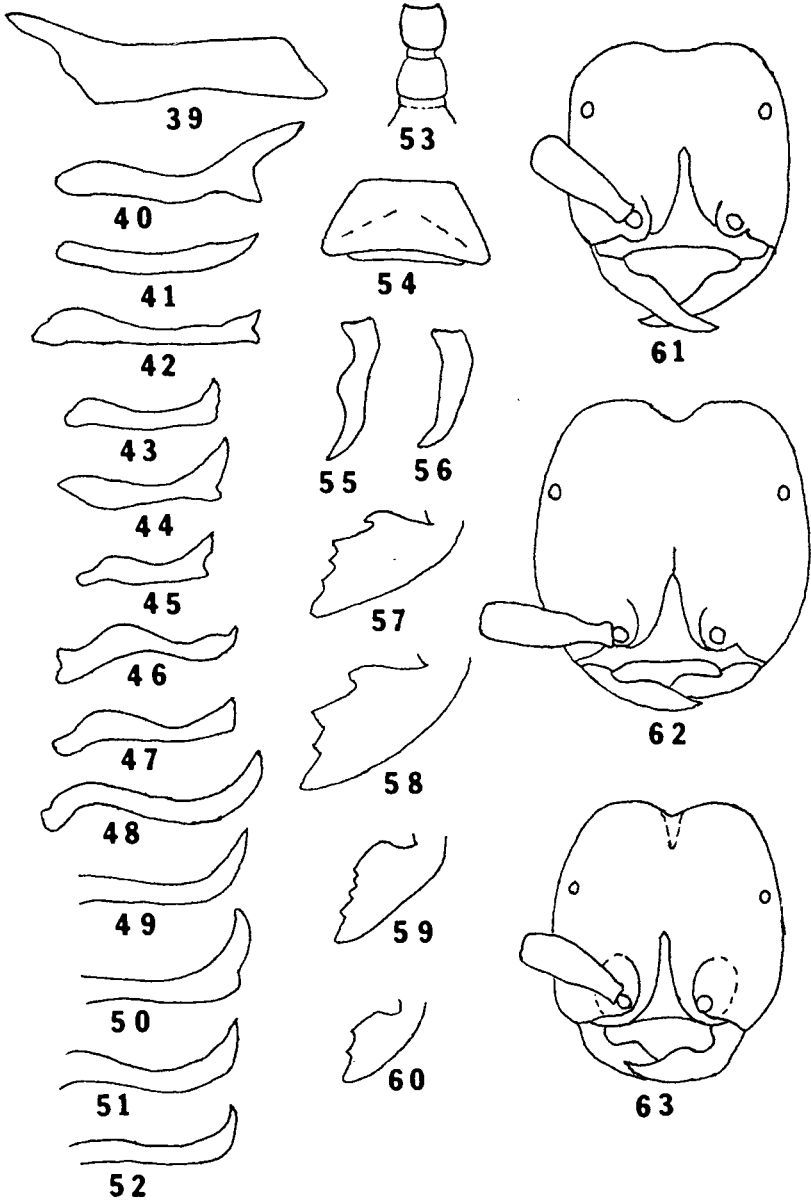
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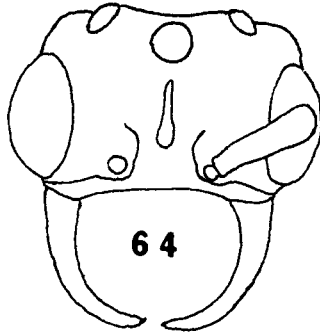


FIG. 64, head of *Neivamyrmex fuscipennis* male.