

**THE ANTS (HYMENOPTERA, FORMICIDAE)  
OF WESTERN TEXAS. PART III. ADDITIONS  
AND CORRECTIONS**

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## INTRODUCTION

This contribution is the third and last part to a study on the ants of western Texas. The first part (Moody and Francke, 1982) dealt with ants of the subfamily Myrmicinae, the second part (Cokendolpher and Francke, 1989) dealt with the remaining five subfamilies, and this contribution corrects earlier errors and provides new records.

The objectives of this study are the same as those stated in Part I: to determine which ant species inhabit western Texas, to define geographic regions in which they occur, and to explore some of the abiotic factors correlated with their distributions.

## RESULTS AND DISCUSSION

### *Additions and Corrections to Myrmicinae*

Since the publication of the first part in this series, many papers have appeared that deal with species of Myrmicinae in western Texas. A revised listing of species of Myrmicinae from western Texas can be found in Appendix 1. Neece and Bartell (1982) reported on the insects and mites associated with ants in western Texas. Their study was extensive and many new records of myrmecophiles were recorded. Twenty-nine species of Myrmicinae in nine genera were listed. Their collections were from 577 localities in 98 western Texas counties.

Van Pelt (1983) published a paper dealing with extensive collections of ants from the Chisos Mountains, Brewster County. In addition to providing new habitat and biological information, he reported several myrmecines for the first time for western Texas (listed below under the appropriate generic headings).

Wheeler and Wheeler (1985) published a checklist of the ants of Texas. They added several new records for Myrmicinae from that state which are discussed below under the appropriate generic headings. They also provided a synopsis of the various vegetational areas in Texas.

### Genus *Myrmica* Latreille

André Francoeur recently has studied many of the specimens of *Myrmica* collected in western Texas. The two samples reported by Moody and Francke (1982:fig. 2) and Wheeler and Wheeler (1985) as *Myrmica emeryana* Forel are actually representatives of an undescribed species and are to be described by Francoeur. I am not aware of a valid record of *M. emeryana* from Texas. The species listed by Moody and Francke (1982) and Wheeler and Wheeler (1985) as *Paramyrmica colax* Cole now is placed in combination with *Myrmica* (Francoeur, 1968; Bolton, 1988).

### Genus *Pogonomyrmex* Mayr

Taber *et al.* (1987b) and Taber and Cokendolpher (1988) reported on scanning electron microscopic and karyotypic studies, respectively, of all the species of *Pogonomyrmex* (except *P. bigbendensis* Francke and Merikel and *P. texanus* Francke and Merikel) known from western Texas. Taber (1988) provided the description of the gyne of *P. texanus*.

Wheeler and Wheeler (1985) and some other recent authors (see Taber *et al.*, 1987b; Taber and Cokendolpher, 1988) have regarded *Ephebomyrmex* Wheeler as a genus separate from *Pogonomyrmex*. Only a single species, *E. imberbiculus* (Wheeler), of what they referred to *Ephebomyrmex* occurs in western Texas. *Ephebomyrmex* is not herein considered to be a valid genus.

#### Genus *Aphaenogaster* Mayr

Van Pelt (1983) reported the first *Aphaenogaster boulderensis smithi* Gregg from western Texas. His specimens were from the Chisos Mountains, Brewster County, at 1100 meters elevation in grasslands. Nests were rare and found under rocks.

#### Genus *Pheidole* Westwood

Van Pelt (1983) reported the first *Pheidole clydei* Gregg and *Pheidole vallicola* Wheeler from western Texas. His specimens were from the Chisos Mountains, Brewster County. *Pheidole clydei* nests were in soil and under rocks in grasslands and pinyon areas at 1600 to 1900 meters in elevation.

Wheeler and Wheeler (1985) added a new western Texas record (Hale County) for *Pheidole sitarches campestris* Wheeler. A gynandromorphic *Pheidole dentata* Mayr was reported from western Texas (Lubbock County) by Jones and Phillips (1985). Beckham *et al.* (1982) found microbial association with ants extremely low. They stated that an examination of 2525 nest series, from 404 sites in western Texas, revealed only one ant, *Pheidole bicarinata vinelandica* Forel, that contained resting spores of the fungus *Entomophthora* sp.

#### Genus *Crematogaster* Lund

Richerson and Jones (1982) reported on aphid tending by *Crematogaster punctulata* Emery in the Davis Mountains area. The aphids (*Aphis lugentis* Williams) were feeding on the treadleaf groundsel, *Senecio douglassii* DC. var. *longilobus* (Benth.).

#### Genus *Stenammas* Westwood

Van Pelt (1983) reported the first *Stenammas huachuacanum* Smith from Texas. His material was collected at 1900 meters in elevation in the Chisos Mountains, Brewster County. Nests of this species were under rocks in high forest characterized by Douglas fir, *Pseudotsuga Menziesii* (Mirb.), Arizona cypress, *Cupressus arizonica* Genee, and ponderosa pine, *Pinus ponderosa* Laws.

#### Genus *Monomorium* Mayr

Jones *et al.* (1982) reported on alkaloids found in venom from several species of *Monomorium*. One species, *M. cyaneum* Wheeler (reported as "*M. near emersoni*") was from Lubbock, Lubbock County. DuBois (1986) revised the native New World *Monomorium* species. The taxonomic changes proposed in this work require a revised account of this genus in western Texas. *Monomorium minimum* (Buckley) has winged queens. The workers have a smooth mesopleuron and more than 10 erect to suberect setae on the thoracic dorsum. This is the common species of *Monomorium* in the

erect to suberect setae on the thoracic dorsum. This is the common species of *Monomorium* in the midwestern and eastern United States. *Monomorium cyaneum* queens are wingless and thus lack alar sclerites, a feature detectable even in pupae. The workers of *M. cyaneum* have a punctate mesopleuron with four to eight erect setae on the thoracic dorsum. This species is widely distributed in México and also occurs in Arizona, New Mexico, and Texas. In Texas, the distributions of *M. minimum* and *M. cyaneum* overlap (DuBois, 1986), although the two species were not distinguished in Part I. *Monomorium viride peninsulatum*, according to DuBois, is a clear synonym of *M. viride* which does not occur in Texas. The sample reported by Moody and Francke (1982) as *M. viridum* has been examined by Dr. DuBois and found to be *M. cyaneum*.

Wheeler and Wheeler (1985) recorded the first *Monomorium pharaonis* (Linné) from Taylor County. Since the publication of the first part of this series, several additional collections of this species have been made in Lubbock, Lubbock County. This ant has become a pest in several apartment buildings in Lubbock and in at least one dorm building on the Texas Tech University campus.

#### Genus *Solenopsis* Westwood

The fire ants of the genus *Solenopsis* have received considerable attention in the past several years. Francke *et al.* (1983) reported the distribution of members of the genus in Texas, included maps, and county records for the four species found in western Texas. Updated maps and new county records for the red imported fire ant, *Solenopsis invicta* Buren, were provided by Cokendolpher and Phillips (1989). Studies relating the effects of temperature and humidity on four species of *Solenopsis* in western Texas have been reported by Potts *et al.* (1984), Cokendolpher and Francke (1985), Francke *et al.* (1985, 1986), Francke and Cokendolpher (1986), Taber *et al.* (1987a), and Braulick *et al.* (1988). Cokendolpher and Phillips (1989) reported on the current distribution and range expansion of *S. invicta* in western Texas. A gynandromorphic *Solenopsis aurea* Wheeler from western Texas (Garza County) was reported by Cokendolpher and Francke (1983).

#### Genus *Leptothorax* Mayr

Since the publication of Part I, Dr. André Francoeur has studied many of the species of *Leptothorax* collected in western Texas. The sample reported from Jeff Davis County as *Leptothorax schauvi* Roger was misidentified. These ants are properly *Leptothorax carinatus* Cole, which is already known from Jeff Davis County. Of the five samples of *Leptothorax nitens* Emery reported (Moody and Francke, 1982:fig. 23), only one series from El Paso County was correctly identified. The remaining samples from Lubbock, Randall, and Potter counties are *Leptothorax obliquicanthus* Cole and represent the first records of this species from Texas. It was formerly known only from New Mexico and Colorado (Smith, 1979). A single founder queen of *Leptothorax hispidus* Cole not previously identified nor reported by Moody and Francke (1982) has now been identified. The queen

was collected at the type locality for the species, Limpia Canyon in the Davis Mountains.

Van Pelt (1983) reported four additional species of *Leptothorax* from western Texas. *Leptothorax pergandei pergandei* Emery, *Leptothorax rugatulus rugatulus* Emery, *Leptothorax terrigena* Wheeler, *Leptothorax tricarinatus neomexicanus* Wheeler all were collected from the Chisos Mountains, Brewster County. *Leptothorax pergandei pergandei* was collected at 1600 to 2000 meters in elevation, occasionally in grasslands, abundantly in the pinyon area, and commonly in the canyons. Nests were in open soil. *Leptothorax rugatulus rugatulus* was collected at 1600 to 2300 meters in elevation with nests being in the soil, under rocks, and in arboreal situations. This species was rare in the pinyon area and abundant in the high forest and canyons. *Leptothorax terrigena* was located in all habitats except the grasslands. Nests were in soil, under rocks, or in arboreal habitats at elevations of 1600 to 2200 meters. *Leptothorax tricarinatus neomexicanus* was rarely found in grasslands and pinyon areas with nests being in arboreal habitats at 1700 to 1900 meters in elevation.

#### Genus *Tetramorium* Mayr

In Part I of this series, *Tetramorium spinosus insons* (Wheeler) was reported from 19 counties in western Texas. A reexamination of those specimens revealed that two species are present, following Bolton's (1979) revision. The two species can be separated by the following couplet which is slightly modified from the key given by Bolton (1979):

Eyes relatively large, maximum diameter at least (usually more than) 0.26 of maximum head width; hairs on pronotal dorsum and on upper frontal carinae short and straight, usually stubblelike, shorter than the maximum diameter of the eye. . . . . *T. hispidum*

Eyes relatively small, maximum diameter at most (usually less than) 0.25 of maximum head width; hairs on pronotal dorsum and on upper frontal carinae long, fine, and often curved, many of them longer than the maximum diameter of the eye. . . . . *T. spinosum*

#### *Tetramorium spinosum* (Pergande)

Bolton (1979) reported the range of this ant as western states and Nuevo León in México, Texas, and Arizona. In western Texas, the range of *T. spinosum* overlaps that of *T. hispidum*, but the former species is less abundant in the Trans-Pecos region and *T. spinosum* is found alone in the Rio Grande Plains region. Seventeen series of this species were collected in western Texas from 11 localities in 10 counties—Brewster, Concho, Dimmit, Kimble, Maverick, Nolan, Reagan, Scurry, Val Verde, and Webb. The collection localities (number of series in parentheses) were at 160 to 244 (three), 518 to 853 (seven), and 1204 (one) meters in elevation and soils were sandy loam (two), sandy clay loam (one), clay loam (two), silty clay loam (one), and clay (five). Twelve nests were found in open, fully exposed situations. All nests were on level to slightly sloping (zero to five degrees) ground. Bolton (1979) recorded this species from two additional counties; Crockett and Kinney.



*Tetramorium hispidum* (Wheeler)

This ant is known only from western Texas and Arizona (Bolton, 1979). As already noted above, the range of this ant overlaps that of *T. spinosum*; however, *T. hispidum* also is found alone in the southern High Plains region. Fifteen series from 14 localities were collected in 12 counties of western Texas—Brewster, Crane, Crosby, Garza, Howard, Irion, Jeff Davis, Lubbock, Midland, Scurry, Sterling, and Terrell. The collection localities (number of series in parentheses) are at 640 to 1006 (11), 1204 (one), 1341 (one), and 1493 (one) meters in elevation. The soils at these localities are fine sandy loam (one), sandy loam (one), loam (seven), silt loam (one), clay loam (three), and clay (one). Seven nests were located on level, open ground; one nest was on open ground with a 10 degrees slope, and two nests were on level ground under rocks.

Genus *Trichoscapa* Emery

Members of this monotypic genus have been spread around the tropical regions of the world by commerce. Introductions to temperate zone localities also have been recorded (Smith, 1979).

*Trichoscapa membranifera* (Emery)

A single dealate female of this minute ant was collected in a yard in Lubbock, Lubbock County. The ant was collected in early September along with Collembola from under a wooden rail partially buried in moist, humic, garden soil. This is the first record of this genus and species in Texas. Previously, this species was recorded in the United States from California, and along the coastal states from Louisiana to Florida (Smith, 1979; Ward, 1988).

Genus *Trachymyrmex* Forel

Van Pelt (1983) reported the first *Trachymyrmex arizonensis* (Wheeler) from western Texas. His samples were from 1600 meters in elevation in the Chisos Mountains, Brewster County. Nests were occasionally found in pinyon areas under rocks.

## REVISED KEY TO WORKERS OF WESTERN TEXAS MYRMICINAE

With the addition of two genera (*Stenammas* and *Trichoscapa*) and the deletion of one genus (*Paramyrmica*), the key to the genera in Part I of this series is obsolete. The following key incorporates these changes as well as some minor changes correcting problems in terminology.

1. Antennae with six segments . . . . . 2  
    Antennae with more than six segments . . . . . 3
2. Mandibles short and triangular with uniformly sized denticles distally. . . . . *Trichoscapa*  
    Mandibles long and slender, with distal two teeth enlarged. . . . . *Strumigenys*
3. Postpetiole attached to dorsal surface of first gastric segment; gaster flattened dorsally but much more convex ventrally, acutely pointed behind. . . . . *Crematogaster*  
    Postpetiole attached to anterior end of first gastric segment; gaster about equally convex above and below, not notably pointed behind. . . . . 4
4. Antennae with 10 segments, the last two forming a distinct club . . . . . *Solenopsis*  
    Antennae with more than 10 segments, the club, if present, only rarely of two segments. . . . . 5

- 5. Antennae with 11 segments. . . . . 6
- Antennae with 12 segments. . . . . 12
- 6. Dorsum of the pronotum, mesonotum, and propodeum with spines, teeth, rounded bosses, or prominent ridges; antennal fossa always bounded by a delicate carina that extends diagonally inward from the insertion of the mandible past the inner border of the eye. . . . . 7
- Dorsum of the pronotum and mesonotum without spines, projecting bosses, or ridges (spines and teeth, when present, confined to the propodeum); antennal fossa only rarely bordered by a diagonal carina and, if present, the size of the worker does not exceed 2 millimeters. . . . . 10
- 7. Frontal carinae projecting forward above clypeus, largely or entirely concealing lateral portions of clypeus when head is viewed from above; thoracic spines, when present, short and dentiform . . . . . *Cyphomyrmex*
- Frontal carinae shorter, not projecting above clypeus or at most projecting above its posterior half, the full width of clypeus visible from above; thoracic spines long and prominent . . . . . 8
- 8. Thoracic dorsum armed with three pair of spines; large, highly polymorphic species, the length of workers ranging from 2 to 12 millimeters. . . . . *Atta*
- Thoracic dorsum armed with more than three pair of spines; less polymorphic or monomorphic species of smaller size, length 6 millimeters or less. . . . . 9
- 9. Entire ant, including antennal scapes and legs, covered with numerous small tubercles; frontal carinae extending almost to occipital corners; occipital emargination shallow. . . . . *Trachymyrmex*
- Tubercles confined mostly to gaster, postpetiole, and tops of occipital lobes; frontal carinae indistinct behind and not extending to occipital corners, occiput deeply emarginate in the largest workers . . . . . *Acromyrmex*
- 10. Antennal club quite distinct and consisting of two segments that are notably broader and longer than the seven smaller, more proximal segments that precede them . . . . . *Oligomyrmex*
- Antennal club, if present, usually indistinct, consisting of more than two segments. . . . . 11
- 11. Frontal carinae extending posteriorly at least two-thirds of the distance to posterolateral angles of the head, and each bordering a shallow scrobe for reception of the antennal scape, the latter often flat. . . . . *Tetramorium*
- Frontal carinae short, no antennal scrobes present, antennal scape not flattened . . . . . *Leptothorax*
- 12. Middle and hind tibial spurs finely pectinate, teeth distinct and regular but usually too small to be detected unless a magnification of 100 X or more is used. . . . . 13
- Middle and hind tibial spurs simple or absent, rarely with a few barbules but never pectinate. . . 14
- 13. Thoracic dorsum with sutures reduced or absent; thorax not impressed between mesonotum and propodeum; psammophore usually present . . . . . *Pogonomyrmex*
- At least mesopropodeal suture present and distinct on thoracic dorsum; thorax impressed at mesopropodeal suture; psammophore absent. . . . . *Myrmica*
- 14. Petiole subcylindrical, without a distinct node above. . . . . *Myrmecina*
- Petiole with a distinct node, anterior peduncle distinct even when short. . . . . 15
- 15. Propodeum without spines or teeth, basal face at same level as dorsum of mesonotum. *Monomorium*
- Propodeum usually with spines or teeth; but, if unarmed, basal face is distinctly below level of dorsum of mesonotum . . . . . 16
- 16. Worker caste dimorphic (rarely polymorphic) with head of the major disproportionately large. . . . . *Pheidole*
- Worker caste monomorphic, or if polymorphic, head of the major worker is not disproportionately large. . . . . 17
- 17. Thoracic dorsum with mesopropodeal suture absent or poorly defined. . . . . 18
- Thoracic dorsum with mesopropodeal suture well marked . . . . . 19
- 18. 10 to 12 millimeters in length; antennal scapes projecting well beyond occipital border. . . . . *Aphaenogaster*
- Not more than 4 millimeters in length and often less; antennal scapes usually not surpassing occipital border and never projecting much beyond it . . . . . *Leptothorax*
- 19. Eyes small; antennae with last four segments enlarged but not forming a club; small (2 to 25 millimeters), slender ants. . . . . *Stenammas*
- Eyes larger; antennal club indistinct with three to five segments, medium-sized ants . . . . . 20

20. Propodeum depressed well below level of pronotum, in profile mesonotum forming a sloping declivity between them; antennal club indistinct, of four or five segments . . . . . *Aphaenogaster*  
 Thorax seen in profile with propodeum as high as promesonotum, thoracic dorsum usually forming an unbroken plane, more rarely with the propodeum separated from the mesonotum by a deep impression; antennal club of three segments . . . . . *Leptothorax*

## ANT FAUNA

Moody and Francke (1982) reported the subfamily Myrmicinae as represented in western Texas by 17 genera and 89 species. Herein, the addition of two genera and 14 species, with the deletion of one genus and two species, results in the recognition of 18 genera and 101 species of Myrmicinae from western Texas. In Part II, 24 genera and 83 species were recorded from western Texas in the subfamilies Ecitoninae, Ponerinae, Pseudomyrmecinae, Dolichoderinae, and Formicinae. Thus, the known formicid fauna of western Texas currently consists of six subfamilies, 42 genera, and 184 species. A revised listing of all ant taxa from this region are listed in Appendix I. Two additional species (*Formica neoclara* and *Hypoponera punctatissima*) probably also are present, based on their known distributions elsewhere in Texas and surrounding states.

Although several species are wide ranging, most are restricted to one or two vegetative regions. Twenty-four wide ranging species are present in all of the western Texas vegetative regions: *Brachymyrmex depilis*, *Camponotus discolor*, *C. festinatus*, *Conomyrma bicolor*, *C. flava*, *C. insana*, *Crematogaster laeviuscula*, *Forelius foetidus*, *F. pruinus*, *Formica gnava*, *Labidus coecus*, *Monomorium minimum*, *Myrmecocystus placodops*, *Odontomachus clarus*, *Paratrechina vividula*, *Pheidole bicarinata longula*, *P. dentata*, *P. sitarches soritis*, *Pogonomyrmex apache*, *P. barbatus*, *P. imberbiculus*, *Solenopsis aurea*, *S. xyloni*, and *Trachymyrmex turrifex turrifex*.

Twenty-three other species are relatively common and were found in four of the five regions sampled: *Aphaenogaster cockerelli*, *Camponotus sansabeanus*, *C. vicinus*, *Crematogaster minutissima missouriensis*, *C. punctulata*, *Hypoponera opacior*, *Myrmecocystus depilis*, *M. mendax*, *M. mimicus*, *Neivamyrmex nigrescens*, *Paratrechina terricola*, *Pheidole cockerelli*, *P. crasicornis tetra*, *P. hyatti hyatii*, *P. pilifera coloradensis*, *P. porcula*, *Pogonomyrmex desertorum*, *P. rugosus*, *P. texanus*, *Solenopsis molesta*, *S. salina*, *Tetramorium hispidum*, and *T. spinosum*.

Many more species were encountered in the Trans-Pecos region than in any other "region" in western Texas. As noted by Wheeler and Wheeler (1985), this region is not truly a single vegetational area. It is a group of areas that ecologists have not clearly defined. Of the 132 species recorded from this region, 59 are restricted to the Trans-Pecos region in Texas: *Acanthomyops arizonicus*, *Acromyrmex versicolor chisosensis*, *Amblyopone pallipes*, *Aphaenogaster albisetosa*, *A. boulderensis smithi*, *Camponatus abdominalis transvectus*, *C. cuauhtemoc*, *C. ocreatus*, *C. ulcerosus*, *Cerapachys davisi*, *Colobopsis pylartes*, *Crematogaster browni*, *C. colei*, *C. depilis*, *C. emeryana*, *C. hespera*, *C. isolata*, *C. larreae*, *Formica nitidiventris*, *F. puberula*, *Hypoponera opaciceps*, *Lasius sitiens*, *Leptothorax carinatus*, *L. hispidus*, *L. nitens*, *L. pergandei pergandei*, *L. rugatulus brunnescens*, *L. rugatulus rugatulus*, *L. terrigena*, *L. tricarinatus neomexicanus*, *Liometopum luctuosum*, *Myrmecocystus melliger*, *Myrmica* sp., *M. colax*, *M. striolagaster*, *Neivamyrmex fallax*, *N. macropterus*, *N. minor*, *N. pauxillus*, *Paratrechina austroccidua*, *P. bruesii*, *Pheidole ceres*, *P.*

*clydei*, *P. marcidula*, *P. micula*, *P. militicida*, *P. pilifera artemisia*, *P. pinealis*, *P. sciophila*, *P. titanis*, *P. vallicola*, *P. xerophila tucsonica*, *Pogonomyrmex bigbendensis*, *P. californicus*, *Pseudomyrmex pallidus*, *Solenopsis* sp. B., *S. tennesseensis*, *Stenamamma huachuacanum*, *Trachymyrmex arizonensis*, and *T. smithi smithi*. The wide variety of habitats from lowland deserts to highland coniferous forests certainly accounts for much of this diversity in ants.

Approximately the same numbers of ant species occur in the High Plains, Rolling Plains, and portion of the Edwards Plateau in western Texas; 71, 80, 86, respectively. The numbers of species restricted to these areas (nine, six, nine, respectively) is about 13 percent that of the number restricted to the Trans-Pecos region. Those species restricted to the High Plains of western Texas include *Formica bradleyi*, *F. gynocrates*, *F. montana*, *Formica* sp. (near *integroides*), *Myrmecocystus romainei*, *Neivamyrmex leonardi*, *Pheidole senex*, *P. tysoni*, and *Trichoscapa membranifera*. Species recorded only from the Rolling Plains are *Acanthomyops interjectus*, *Aphaenogaster tennesseensis*, *Crematogaster lineolata*, *Formica pallidefulva*, *F. subsericea*, and *Myrmecocystus navajo*. Species recorded from the portion of the Edwards Plateau that is included in western Texas are *Myrmecina americana*, *Neivamyrmex melsheimeri*, *Oligomyrmex longii*, *Pheidole* sp. B, *P. casta*, *P. lamia*, *P. metallescens splendidula*, *Proceratium compitale*, and *Solenopsis* sp. A.

Only 48 species are recorded from that portion of the Rio Grande Plains that extends into western Texas. Of those species, only seven do not occur elsewhere in western Texas—*Cyphomyrmex rimosus*, *Neivamyrmex fuscipennis*, *N. texanus*, *Pachycondyla villosa*, *Pheidole* sp. A, *P. humeralis*, and *P. ridicula*.

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APPENDIX 1.—*Ants of western Texas: number of series collected and number of localities, counties, and vegetational regions (see Cokendolpher and Francke, 1989:fig. 1) in which each species was found during this study. Ants recorded in other studies but not recollected during this study are listed, followed by dashes and numbers in brackets. Ants suspected as occurring in western Texas, but not actually recorded, are listed followed by dashes and a question mark under regions.*

Taxa	Series	Localities	Counties	Regions
<b>MYRMICINAE</b>				
<i>Myrmica colax</i>	-	-	-	[4]
<i>Myrmica striolagaster</i>	3	2	2	4
<i>Myrmica</i> sp.	2	1	1	4
<i>Pogonomyrmex apache</i>	32	25	17	1-5
<i>Pogonomyrmex barbatus</i>	551	313	87	1-5
<i>Pogonomyrmex bigbendensis</i>	2	2	1	4
<i>Pogonomyrmex californicus</i>	8	7	2	4
<i>Pogonomyrmex comanche</i>	15	8	5	1,2
<i>Pogonomyrmex desertorum</i>	86	50	20	1-4
<i>Pogonomyrmex imberbiculus</i>	112	77	31	1-5
<i>Pogonomyrmex maricopa</i>	89	63	22	1,2,4
<i>Pogonomyrmex occidentalis</i>	26	13	8	1,2,4
<i>Pogonomyrmex rugosus</i>	356	217	66	1-4
<i>Pogonomyrmex texanus</i>	22	17	14	1-4
<i>Stenamma huachucanum</i>	-	-	-	[4]
<i>Aphaenogaster albisetosa</i>	28	21	4	4
<i>Aphaenogaster boulderensis smithi</i>	-	-	-	[4]
<i>Aphaenogaster cockerelli</i>	140	102	35	1-4
<i>Aphaenogaster tennesseensis</i>	3	2	1	2
<i>Aphaenogaster texana</i>	12	6	4	2,4
<i>Pheidole bicarinata longula</i>	9	8	8	1-5
<i>Pheidole bicarinata vinelandica</i>	72	103	49	1-3
<i>Pheidole casta</i>	-	-	-	[3]
<i>Pheidole ceres</i>	3	1	1	4
<i>Pheidole clydei</i>	-	-	-	[4]
<i>Pheidole cockerelli</i>	28	23	16	1-3,[4]
<i>Pheidole crassicornis crassicornis</i>	6	6	5	1,4
<i>Pheidole crassicornis tetra</i>	19	16	15	1-4
<i>Pheidole dentata</i>	136	83	43	1-5
<i>Pheidole desertorum</i>	20	12	7	2,4
<i>Pheidole humeralis</i>	4	1	1	5
<i>Pheidole hyatti hyatti</i>	97	70	3	1-4
<i>Pheidole lamia</i>	4	3	3	3
<i>Pheidole macclendoni</i>	3	2	2	3,5
<i>Pheidole marcidula</i>	1	1	1	4
<i>Pheidole metallescens metallescens</i>	10	8	7	2,3,5

APPENDIX 1.—*Continued.*

Taxa	Series	Localities	Counties	Regions
MYRMICINAE ( <i>continued</i> )				
<i>Pheidole metallescens splendidula</i>	1	1	1	3
<i>Pheidole micula</i>	1	1	1	4
<i>Pheidole militicida</i>	4	1	1	4
<i>Pheidole pilifera artemisia</i>	2	2	2	4
<i>Pheidole pilifera coloradensis</i>	32	24	14	1,2,4,5
<i>Pheidole pinealis</i>	3	3	3	4
<i>Pheidole porcula</i>	68	37	23	2-5
<i>Pheidole ridicula</i>	2	1	1	5
<i>Pheidole rugulosa</i>	27	20	10	1,3,4
<i>Pheidole sciara</i>	12	10	9	1,3,4
<i>Pheidole sciophila</i>	1	1	1	4
<i>Pheidole senex</i>	2	2	2	1
<i>Pheidole sitarches campestris</i>	15	11	10	[1],2,3
<i>Pheidole sitarches sitarches</i>	6	6	5	1,3,5
<i>Pheidole sitarches sortis</i>	71	53	36	1-5
<i>Pheidole tepicana</i>	26	14	10	2,3,5
<i>Pheidole texana</i>	2	2	2	3,5
<i>Pheidole titanis</i>	-	-	-	[4]
<i>Pheidole tysoni</i>	1	1	1	1
<i>Pheidole vallicola</i>	-	-	-	[4]
<i>Pheidole xerophila tucsonica</i>	2	1	1	4
<i>Pheidole xerophila xerophila</i>	68	39	13	3,4
<i>Pheidole</i> sp. A	11	3	3	5
<i>Pheidole</i> sp. B	1	1	1	3
<i>Crematogaster browni</i>	7	5	2	4
<i>Crematogaster colei</i>	3	2	2	4
<i>Crematogaster depilis</i>	10	10	6	4
<i>Crematogaster emeryana</i>	17	6	3	4
<i>Crematogaster hespera</i>	1	1	1	4
<i>Crematogaster isolata</i>	5	3	2	4
<i>Crematogaster laeviuscula</i>	38	33	22	1-5
<i>Crematogaster larreae</i>	1	1	1	4
<i>Crematogaster lineolata</i>	1	1	1	2
<i>Crematogaster minutissima missouriensis</i>	14	11	10	1-4
<i>Crematogaster punctulata</i>	400	214	78	1-4
<i>Monomorium cyaneum</i>	1	1	1	[1]3
<i>Monomorium minimum</i>	174	119	52	1-5
<i>Monomorium pharaonis</i>	1	1	1	1[2,3]
<i>Solenopsis aurea</i>	107	73	32	1-5

## APPENDIX 1.—Continued.

Taxa	Series	Localities	Counties	Regions
MYRMICINAE (continued)				
<i>Solenopsis geminata</i>	17	9	6	3,5
<i>Solenopsis invicta</i>	-	-	-	[1,2]
<i>Solenopsis kroekowi</i>	9	8	7	1,3,4
<i>Solenopsis molesta</i>	23	22	12	1-4
<i>Solenopsis salina</i>	43	29	20	1-4
<i>Solenopsis tennesseensis</i>	1	1	1	4
<i>Solenopsis xyloni</i>	322	158	58	1-5
<i>Solenopsis</i> sp. A	1	1	1	3
<i>Solenopsis</i> sp. B	1	1	1	4
<i>Oligomyrmex longii</i>	1	1	1	3
<i>Leptothorax carinatus</i>	-	-	-	[4]
<i>Leptothorax hispidus</i>	1	1	1	4
<i>Leptothorax nitens</i>	1	1	1	4
<i>Leptothorax obliquicanthus</i>	5	4	4	1,2
<i>Leptothorax obturator</i>	2	2	2	3,5
<i>Leptothorax pergandei pergandei</i>	-	-	-	[4]
<i>Leptothorax rugatulus brunnescens</i>	3	2	1	4
<i>Leptothorax rugatulus rugatulus</i>	-	-	-	[4]
<i>Leptothorax schaumii</i>	6	4	3	2,3,[4]
<i>Leptothorax terrigena</i>	-	-	-	[4]
<i>Leptothorax tricarinatus neomexicanus</i>	-	-	-	[4]
<i>Myrmecina americana</i>	1	1	1	3
<i>Tetramorium hispidum</i>	15	14	12	1-4
<i>Tetramorium spinosum</i>	17	11	10	2-5
<i>Strumigenys louisianae</i>	3	3	3	3,4
<i>Trichoscapa menbranifera</i>	1	1	1	1
<i>Cyphomyrmex rimosus</i>	1	1	1	5
<i>Cyphomyrmex wheeleri</i>	11	8	7	2-4
<i>Trachymyrmex arizonensis</i>	-	-	-	[4]
<i>Trachymyrmex septentrionalis</i>	1	1	1	2,[4]
<i>Trachymyrmex smithi smithi</i>	12	8	4	4
<i>Trachymyrmex turrifex turrifex</i>	41	31	22	1-5
<i>Acromyrmex versicolor chisosensis</i>	-	-	-	[4]
<i>Atta texana</i>	11	9	4	3,5
ECITONINAE				
<i>Labidus coecus</i>	18	16	14	1-5
<i>Neivamyrmex fallax</i>	-	-	-	[4]
<i>Neivamyrmex fuscipennis</i>	1	1	1	5



APPENDIX 1.—*Continued.*

Taxa	Series	Localities	Counties	Regions
<b>ECITONINAE (continued)</b>				
<i>Neivamyrmex harrisii</i>	6	6	6	1,3,4
<i>Neivamyrmex leonardi</i>	1	1	1	1
<i>Neivamyrmex macropterus</i>	1	1	1	4
<i>Neivamyrmex melsheimeri</i>	-	-	-	[3]
<i>Neivamyrmex minor</i>	5	5	3	4
<i>Neivamyrmex nigrescens</i>	14	13	11	1-4
<i>Neivamyrmex opacithorax</i>	3	3	3	3,[4],5
<i>Neivamyrmex paucillus</i>	-	-	-	[4]
<i>Neivamyrmex pilosus mexicanus</i>	2	2	2	2,4
<i>Neivamyrmex swainsonii</i>	5	5	4	1,4
<i>Neivamyrmex texanus</i>	3	3	2	5
<b>PONERINAE</b>				
<i>Amblyopone pallipes</i>	1	1	1	4
<i>Ceratopachys augustae</i>	2	2	2	2,3,[4]
<i>Ceratopachys davisi</i>	-	-	-	[4]
<i>Hypoponera inexorata</i>	7	5	4	2,[3],4
<i>Hypoponera opaciceps</i>	-	-	-	[4]
<i>Hypoponera opacior</i>	26	21	12	1-4
<i>Hypoponera punctatissima</i>	-	-	-	?
<i>Leptogenys elongata</i>	37	22	11	2,3,5
<i>Odontomachus clarus</i>	110	70	31	1-5
<i>Pachycondyla harpax</i>	18	10	5	3,5
<i>Pachycondyla villosa</i>	1	10	1	5
<i>Ponera pennsylvanica</i>	1	1	1	2,[4]
<i>Proceratium compitale</i>	-	-	-	[3]
<b>PSEUDOMYRMECINAE</b>				
<i>Pseudomyrmex apache</i>	2	2	2	3,4
<i>Pseudomyrmex pallidus</i>	-	-	-	[4]
<b>DOLOCHODERINAE</b>				
<i>Liometopum apiculatum</i>	52	25	9	3,4
<i>Liometopum luctuosum</i>	-	-	-	[4]
<i>Forelius foetidus</i>	321	210	81	1-5
<i>Forelius pruinosus</i>	380	230	76	1-5
<i>Conomyrma bicolor</i>	156	116	49	1-5
<i>Conomyrma flava</i>	549	297	79	1-5
<i>Conomyrma insana</i>	210	151	60	1-5
<i>Tapinoma sessile</i>	5	3	3	3,4

## APPENDIX 1.—Continued.

Taxa	Series	Localities	Counties	Regions
FORMICINAE				
<i>Brachymyrmex depilis</i>	28	25	21	1-5
<i>Paratrechina arenivaga</i>	5	4	3	1,2
<i>Paratrechina austroccidua</i>	-	-	-	- [4]
<i>Paratrechina bruesii</i>	6	4	2	4
<i>Paratrechina terricola</i>	43	27	19	1-3,5
<i>Paratrechina vividula</i>	86	59	-	30 1-5
<i>Prenolepis imparis</i>	10	5	2	2-4
<i>Camponotus abdominalis transvectus</i>	-	-	-	[4]
<i>Camponotus acutirostris</i>	3	3	3	3,4
<i>Camponotus americanus</i>	11	8	5	3,4
<i>Camponotus cuauhquemoc</i>	-	-	-	[4]
<i>Camponotus decipiens</i>	15	13	12	2-4
<i>Camponotus discolor</i>	22	16	13	1-3,[4],5
<i>Camponotus festinatus</i>	104	74	33	1-5
<i>Camponotus nearcticus</i>	8	7	6	3,4
<i>Camponotus ocreatus</i>	-	-	-	[4]
<i>Camponotus pennsylvanicus</i>	4	4	3	1,2
<i>Camponotus sansabeanus</i>	38	21	13	1-4
<i>Camponotus semitestaceus</i>	2	2	2	4,5
<i>Camponotus texanus</i>	4	4	3	3,4
<i>Camponotus ulcerosus</i>	-	-	-	[4]
<i>Camponotus vicinus</i>	25	17	14	1-4
<i>Colobopsis impressa</i>	14	8	6	3,5
<i>Colobopsis pylartes</i>	-	-	-	[4]
<i>Lasius neoniger</i>	54	27	15	1,2
<i>Lasius sitiens</i>	-	-	-	[4]
<i>Acanthomyops arizonicus</i>	1	1	1	4
<i>Acanthomyops interjectus</i>	2	2	1	2
<i>Acanthomyops latipes</i>	4	3	3	2,4
<i>Myrmecocystus depilis</i>	112	74	24	1-4
<i>Myrmecocystus melliger</i>	11	10	4	4
<i>Myrmecocystus mendax</i>	39	35	31	1-3,5
<i>Myrmecocystus mexicanus</i>	13	12	8	3,4
<i>Myrmecocystus mimicus</i>	117	76	36	1-4
<i>Myrmecocystus navajo</i>	1	1	1	2
<i>Myrmecocystus placodops</i>	22	19	13	1-5
<i>Myrmecocystus romainei</i>	7	4	2	1
<i>Formica bradleyi</i>	2	1	1	1
<i>Formica gnava</i>	45	30	20	1-5
<i>Formica gynocrates</i>	2	2	2	1

APPENDIX 1.—*Continued.*

Taxa	Series	Localities	Counties	Regions
FORMICINAE ( <i>continued</i> )				
<i>Formica montana</i>	1	1	1	1
<i>Formica neoclara</i>	-	-	-	?
<i>Formica nitidiventris</i>	2	1	1	4
<i>Formica pallidefulva</i>	1	1	1	2
<i>Formica perpilosa</i>	69	39	23	1,2,4
<i>Formica puberula</i>	-	-	-	[4]
<i>Formica schaufussi</i>	2	2	1	1,2
<i>Formica subsericea</i>	2	2	1	2
<i>Formica</i> sp. (near <i>integroides</i> )	5	3	3	1