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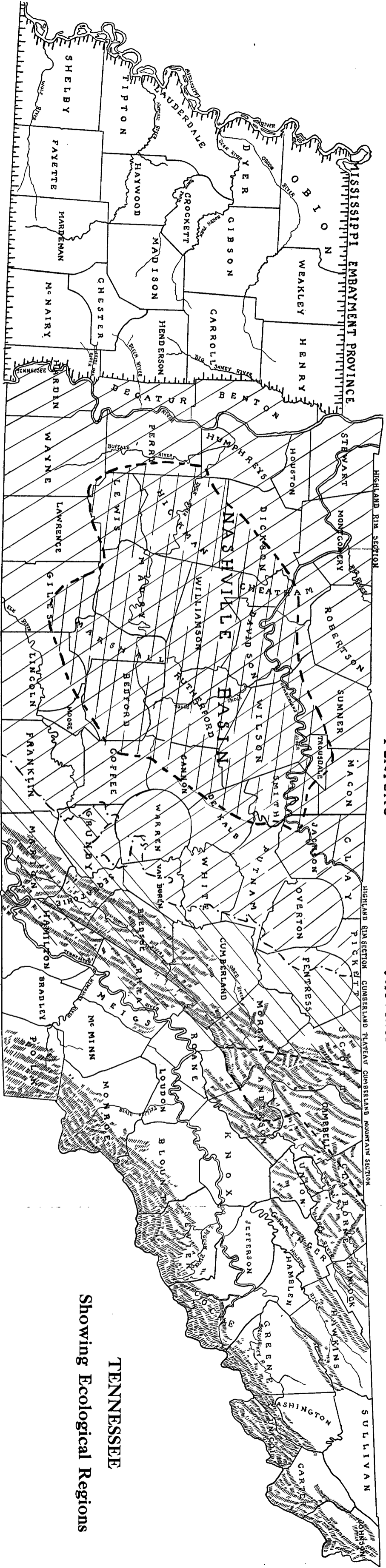
The Distribution of Ant Species in Tennessee With Reference to Ecological Factors

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By

CLYDE A. DENNIS

REPRINTED FROM
ANNALS OF THE ENTOMOLOGICAL SOCIETY OF AMERICA
Vol. XXXI, No. 2, June, 1938



TENNESSEE
Showing Ecological Regions

MISSISSIPPI EMBAYMENT PROVINCE PLATEAU PROVINCE APPALACHIAN VALLEY PROVINCE BLUE RIDGE PROVINCE

THE DISTRIBUTION OF ANT SPECIES IN TENNESSEE WITH REFERENCE TO ECOLOGICAL FACTORS

CLYDE A. DENNIS,
Tusculum College,
Greeneville, Tenn.

This study was undertaken with two ideas in mind: (1) To get a list including as many species as possible of the ants occurring in Tennessee. (2) To determine what ecological factors influence their distribution.

The plan for collecting was to cover as many ecological situations as seemed advisable; at different altitudes, on dry ridges and in wet ravines, open situations and those of dense shade, hill and mountain slopes of all directions, different forest types, and substrata.

GENERAL DESCRIPTION OF REGION

Topographically the State of Tennessee can be divided into three main regions: (See map.)

The eastern or Highland region consisting of the Great Smoky Mountain Range on the south and eastern border, with the Tennessee Valley lying between the Smokies and the Cumberland Mountains on the north.

The central or Plateau region divided into the Cumberland Plateau on the east and the Highland Rim which circles the Nashville Basin to the west of the Cumberland Plateau.

The western portion from about the Tennessee River west, which is the Mississippi Alluvial Plain or sometimes called the Mississippi Embayment.

The eastern or Highland Province has an altitude of around 1500 feet in the valleys to more than 6,000 feet on the highest peaks of the Great Smoky Range. The rainfall averages about 45 inches in the valleys and from 55 to 60 inches in the mountains. The average summer temperature runs between 70° F. and 80° F. with the exception of a few areas in the mountains where it runs between 65° and 75°. The average winter temperature is around 40°. Since extremes are more important from the ecological standpoint than the average, the extremes of temperature for both winter and summer are noted. The highest temperature recorded for Tennessee is 105° and the lowest, -20°.

Tennessee is unglaciated. The parent soil of the eastern half of the Highland Region is sandstone and shale, while the western half is limestone.

The forest in this region is mostly mixed mesophytic and it is very difficult to pick out any forest type in many cases. In a rough way

the following classification is true of the mountain portion; starting at the bottom and in an ascending order, Oak-Hickory (scarce), Hemlock-White Pine (lower valleys), Oak-Pine (*Pinus rigida* and *Pinus echinata*) with Table Mountain Pine on the dry ridges, Oak-Chestnut, Tulip-Hemlock, Maple-Pea Wood, and above 5,000 feet, Spruce followed by Fir at an altitude of 6,000 feet or more.

In the valleys the first in importance is Oak-Chestnut followed by Oak-Pine and Beech-Maple (scarce).

The central or Plateau Province of the state has an altitude around 1,000 feet in the Nashville Basin to 2,000 feet in the eastern Highland Rim section. The annual rainfall averages 40 inches in the Basin and around 55 inches in the Highland Rim. The average summer temperature is between 70° and 80° and the winter average is 40°.

The parent material of the soil in the Nashville Basin is limestone while in the Highland Rim and Cumberland Plateau it is sandstone and shale.

The forest type predominant in the Nashville Basin is Red Cedar with a scattering of scrubby Yellow Oak and Winged Elm. In the eastern Highland Rim the predominant type is Oak-Hickory on the upland and exposed slopes while in the narrow valleys there is a mixed mesophytic forest. On the western portion of the Highland Rim the forest is Oak-Hickory with scattered *Pinus virginiana* and mixed mesophytic in the ravines. On the Cumberland Plateau Oak-Hickory is the predominating type. Here, however, there is a greater predominance of Oak than on the Rim. The Oaks are chiefly Post and Black. The soil here is sand which is several feet deep, thus the area is very well drained.

The western section, the Mississippi Alluvial Plain has an altitude of around 500 feet. The average annual rainfall is from 40 to 50 inches. The average summer temperature is between 70° and 80° and the average winter temperature is 40°.

The parent soil of the region just west of the Tennessee River is sand, clay and limestone, while the territory west of this region, almost to the Mississippi River, is loess and the region bordering the river is river alluvium.

In the counties bordering the Mississippi River the forest is a typical Swamp Forest type. On the bluffs it is mixed mesophytic, while back from the bluffs and along the streams, Pin Oak, Red Gum, Cypress and Cottonwood are common; while farther away from the Mississippi River on the better drained upland alluvial plain the forest is Oak-Hickory. The Oaks are Black, Post, Black Jack, Willow and Scarlet with a few White scattered throughout. Next to the Tennessee River on the cherty, well drained soil with greater relief, there is a drier type of forest consisting chiefly of Black Jack, Post, Black and Scarlet Oak. In the moist ravines are Tulip, Poplar, Beech, Hard Maple (northern) and Red Oak (southern).

METHODS AND POINT OF VIEW

Ants were collected over a period of five years. Since the writer lives at Tusculum College near Greeneville, Tennessee, rather intensive

collecting was done in that area, and he feels that most of the species in that area were taken. Collecting was done in several localities in other parts of the state. In June of 1935 the Mississippi Embayment region was worked but due to very wet weather just before and during the collecting time it was impossible to get into some areas of this region. In June of 1936, collecting was done in the Nashville area and due to the extreme dry weather at that time collecting was very poor, so without a doubt it will be found that there are several species in both these areas that the writer did not take. Data from collections made by C. H. Kennedy in the Great Smokies in Blount County are included.

W. M. Wheeler's keys were used in classifying many of the ants.¹

Wheeler ('32) states that "Ants are so extremely sensitive to the degrees of temperature and humidity of their environment and to the character of its vegetation that many species or subspecies are confined to very narrow ecological habitats." With this in mind, in the following pages each species, subspecies and variety (where enough collections were made) is discussed in relation to the above ecological factors.

GENERAL DISCUSSION OF ECOLOGY AND DISTRIBUTION

It is apparent from the data on the different species, subspecies and varieties that Tennessee is an overlapping area of the northern and southern species of ants of the Eastern United States, as is true in any area as large as a state. It marks the southern limit of several northern species and the northern limit of several southern species.

Due to the mountains whose altitude provides temperature near that of the states farther north, many northern forms are common that are not found at the same latitude at lower altitude. Examples are: *Aphenogaster fulva aquia picea* Emery, *Aphenogaster tennesseensis* Mayr, *Formica sanguinea rubicunda* Emery, *Formica fusca subaenescens* Emery, *Leptothorax longispinosus* Roger, *Myrmica punctiventris pinetorum* Wheeler, and *Myrmica scabrinodis sabuleti* Meinert.

The Mississippi Embayment region and the Nashville Basin include some southern forms not reported from farther north. Examples are: *Aphenogaster texana carolinensis* Wheeler, *Crematogaster opaca depilis punctulata* Emery, *Camponotus caryae rasilis pavidus* Wheeler, *Camponotus (C) mississippiensis* Smith, *Strumigenys louisianae laticephala* Smith, *Strumigenys creightoni* Smith, *Strumigenys dietrichi* Smith and *Trachymyrmex septentrionalis obscurior seminole* Wheeler.

Temperature and humidity certainly seem to be the two most important ecological factors in the distribution of ant species in Tennessee.

Temperature may be more important at times indirectly as a factor in controlling evaporation than as a direct factor. Shelford states in

¹Identifications of many of the ants were kindly checked by Dr. M. R. Smith. I wish also to express my appreciation for help from Dr. C. H. Kennedy and Dr. Mary Talbot.

I am also greatly indebted to Dr. E. N. Transeau and Dr. P. B. Stockdale of Ohio State University, and Mr. Aaron Sharp of the University of Tennessee, for their help on the map of plant ecology of Tennessee.

"Animal Communities in Temperate America" that "The distribution and succession of animals is clearly correlated with the evaporation power of air." Temperature however must in itself be a factor in many cases where there is plenty of moisture regardless of temperature.

The amount of moisture certainly plays equally as important a part as temperature. Talbot ('34) says in regard to six species of *Formica*: "It was found that those living in drier places (black oak, dunes, parities, etc.) were more resistant to dryness than those living where the moisture supply is more constant." In general ants are insects of rather dry situations but in such areas they are sensitive to minor differences in moisture. However, there are a few species in our area, usually found in very shady woods, that can endure a wet habitat during winter and early spring before the season of heavy brood rearing.

Food must play an important part, but many ants are able to use a great variety of food so this factor is hard to analyze.

Sunshine is perhaps a factor in some cases. It seems to attract some species to open and exposed places. It repels others which prefer to nest in shady woods.

Substratum is evidently a factor in a few instances. Sand seems to be necessary for the nesting site of at least one species. (*Pheidole morrissi*). Wood is necessary for several species of *Camponotus*. Very rotten wood is used by *Proceratium*.

Nesting sites in several cases seems to be an important factor. Several species are confined to logs: *Proceratium silaceum* Roger, *Aphenogaster tennesseensis* Mayr, *Aphenogaster lamellidens nigripes* Smith, *Strumigenys dietrichi* Smith, while some others only nest in the ground: *Trachymyrmex septentrionalis obscurior seminole* Wheeler, *Stigmatomma pallipes* Haldeman, *Syphincta pergandei* Emery, *Crematogaster victima missouriensis* Pergande, *Dorymyrmex pyramicus* Roger and *Dorymyrmex flavus* McCook.

In the case of the slave making ants it is necessary for them to be in close proximity to the species which they enslave and thus their distribution is wholly determined by the distribution of the enslaved species.

Although the notes were searched closely the writer was unable to see that the type of ecological forest had any appreciable effect upon the distribution of any ant species.

One very interesting fact brought out in the collecting is the scarcity of ant mounds in Tennessee. In five years of collecting only one small mound was found. This was made by a colony of *Pheidole morrissi*. The nest was located at the foot of Graystone Mountain near Greeneville. It was in a burned over area and the second growth was Laurel and small oak (4-5 feet high). The substratum was sandy loam.

The reason for this scarcity of mounds may be due to two facts: (1) The soil is warmed to such a depth that mounds are unnecessary for incubation of the brood. (2) The state as a whole is well drained. The highland region due to the slopes, the Nashville Basin due to its underground drainage and the Mississippi Embayment due to its sandy soil.

For this reason the ants are not often forced out by the water table coming to the surface as it does in some of the low poorly drained prairie regions. Ants in regions that are flooded several times each summer get away from the water by building mounds into which they can move when their galleries are flooded.

The fact that ants are scarce on the slopes of the mountains is a very interesting one. The base and the tops of the mountains have a rather abundant ant fauna, but there is very poor collecting on the slopes. It may be due to the rather rapid wearing or movement of the soil on these slopes. It may be due to some lack of foods.

The distribution of *Pheidole* and *Aphenogaster fulva aquia picea* are significant enough to bear mentioning. In the valleys several species (*Pheidole commutata*, *vinelandica* and *crassicornis*) are very common, but above the base of the mountains they are absent. Diligent search produced no results even 100 feet above the valley floor. Their absence may be due to the rapid wearing of the slopes and to temperature.

Aphenogaster fulva aquia picea was limited to the tops of the mountains above 5,000 feet, and was most plentiful at 6,000 feet or more. This is a common ant in northern Ohio and other northern states and is probably limited to the high altitudes by the low temperature.

A number of ants seem to be able to thrive in cultivated fields although the top soil may be broken up several times every summer. A few are listed below:

Monomorium minimum Buckley
Pheidole dentata commutata Mayr
Pheidole vinelandica Forel
Crematogaster victima missouriensis Pergande
Aphenogaster treatae Forel
Dorymyrmex pyramicus Roger
Dorymyrmex pyramicus flavus McCook
Iridomyrmex pruinosus analis André
Prenolepis imparis Mayr
Prenolepis (N) *parvula* Mayr
Lasius niger americana Emery
Lasius niger neoniger Emery
Formica pallide-fulva schaufussi Mayr
Formica pallide-fulva schaufussi dolosa Wheeler

A number of ants are found in houses and sometimes may become serious enough to be classed as pests. Several are listed below:

Monomorium pharaonis Linnaeus
Monomorium minimum Emery
Solenopsis molesta Say
Crematogaster lineolata Say
Prenolepis imparis Say
Lasius niger neoniger Emery
Lasius niger americana Emery
Camponotus herculeanus pennsylvanicus DeGeer

Some of the species were well distributed over the state, while others seemed to be limited to certain areas. A list of those with state wide distribution are:

Ponera coarctata pennsylvanica Emery
Ponera trigona opacior Forel
Monomorium minimum Emery
Solenopsis molesta Say
Pheidole dentata commutata Mayr
Pheidole crassicornis Emery
Pheidole vinelandica Forel
Crematogaster lineolata Say
Crematogaster laeviuscula Mayr
Crematogaster victima missouriensis Pergande
Aphenogaster treatae Forel
Aphenogaster lamellidens nigripis Smith
Aphenogaster fulva Roger
Aphenogaster fulva aquia Buckley
Leptothorax curvispinosus Mayr
Leptothorax pergandi floridanus Emery
Dorymyrmex pyramicus Roger
Iridomyrmex pruinosus analis André
Prenolepis imparis Say
Prenolepis (N) *parvula* Mayr
Lasius niger americanus Emery
Lasius umbratus mixtus aphidicola Walsh
Formica pallide-fulva schaufussi incerta Emery
Camponotus castaneus americanus Mayr
Camponotus herculeanus pennsylvanicus DeGeer
Camponotus caryae decipiens Emery

Several species seemed to be confined to the eastern or highland section of the state. They are as follows:

Stigmatomma pallipes Haldeman
Proceratium silaceum Roger
Euponera gilva Roger
Eciton schmitti Emery
Eciton carolinensis Emery
Aphenogaster fulva aquia picea Emery
Aphenogaster tennesseensis Mayr
Myrmica brevinodis Emery
Myrmica scabrinodis fracticornis Emery
Myrmica punctiventris pinetorum Wheeler
Myrmica scabrinodis sabuleti Meinert
Leptothorax longispinosus Roger
Strumigenys creightoni Smith
Strumigenys dietrichi Smith
Tapinoma sessile Say
Brachymyrmex heeri depilis Emery
Lasius interjectus Mayr

Lasius claviger Roger
Formica sanguinea rubicunda Emery
Formica pallide-fulva schaufussi Mayr
Formica subaenescens Emery
Camponotus herculeanus pennsylvanicus ferrugineus Fabr
Camponotus caryae Fitch

Two species appeared to be limited to the Nashville Basin, namely:

Crematogaster opaca depilis punctulata Emery
Leptothorax (D) pergandei Emery

The following seem to be limited to the Mississippi Embayment region:

Aphenogaster texana carolinensis Wheeler
Formica pallide-fulva succinea Wheeler
Camponatus caryae rasilis pavidus Wheeler

Those found on the high mountain peaks are:

Stigmatomma pallipes Haldeman
Ponera coarctata pennsylvanica Emery
Crematogaster lineolata Say
Aphenogaster fulva Roger
Aphenogaster fulva aquia Buckley
Aphenogaster fulva aquia picea Emery
Myrmica scabrinodis sabuleti Meinert
Tapinoma sessile Say
Lasius niger americanus Emery
Lasius umbratus mixtus aphidicola Walsh
Formica sanguinea rubicunda Emery
Formica fusca subaenescens Emery
Camponotus herculeanus pennsylvanicus DeGeer
Camponotus caryae Fitch

Certain species prefer the moist shady forests; following is a list of that type:

Stigmatomma pallipes Haldeman
Proceratium silaceum Roger
Euponera gilva Roger
Ponera coarctata pennsylvanica Emery
Leptothorax curvispinosus Mayr
Strumigenys creightoni Smith
Strumigenys dietrichi Smith
Strumigenys rostrata Emery
Trachymyrmex septentrionalis obscurior seminole Wheeler
Brachymyrmex heeri depilis Emery
Formica fusca subaenescens Emery
Camponotus castaneus americanus Mayr
Camponotus herculeanus pennsylvanicus ferrugineus Fabr.

Several species prefer open situations, clearings or the borders of woods. Examples of those are:

Ponera trigona opacior Forel
Eciton schmitti Emery
Eciton carolinensis Emery
Monomorium minimum Buckley
Pheidole morrissi Forel
Pheidole tysoni Forel
Pheidole crassicornis Emery
Crematogaster laeviuscula Mayr
Crematogaster victima missouriensis Pergande
Aphenogaster treatae Forel
Aphenogaster fulva aquia Buckley
Aphenogaster tennesseensis Mayr
Leptothorax pergandei Emery
Dorymyrmex pyramicus flavus McCook
Dorymyrmex pyramicus Roger
Prenolepis imparis Say
Prenolepis (N) parvula Mayr
Lasius niger neoniger Emery
Lasius interjectus Mayr
Formica pallide-fulva schaufussi incerta Emery

Some species are found either in dense shade or in open situations. This type includes the following:

Myrmecina grammicola americana Emery
Solenopsis molesta Say
Pheidole dentata commutata Mayr
Crematogaster lineolata Say
Aphenogaster lamellidens nigripis Smith
Aphenogaster fulva Roger
Aphenogaster fulva aquia picea Emery
Aphenogaster texana carolinensis Wheeler
Leptothorax longispinosus Roger
Leptothorax pergandei floridanus Emery
Tapinoma sessile Say
Lasius niger americanus Emery
Lasius umbratus mixtus aphidicola Walsh
Formica pallide-fulva schaufussi Mayr
Camponotus caryae rasilis pavidus Wheeler

There are several species that live in trees and get most of their food from insects working on the trees. This food is in the form of honey dew secreted by the insects, some of the species that belong to this group are:

Crematogaster lineolata Say
Crematogaster laeviuscula Mayr
Crematogaster laeviuscula clara Mayr
Leptothorax longispinosus Roger

Leptothorax curvispinosus Mayr
Camponotus herculeanus pennsylvanicus DeGeer
Camponotus caryae Fitch
Camponotus caryae decipiens Emery
Camponotus caryae rasilis Wheeler
Camponotus caryae rasilis pavidus Wheeler
Colobopsis mississippiensis Smith

A few species live in the ground but climb trees to forage for honey dew. They are:

Camponotus castaneus americanus Mayr
Formica fusca subaenescens Emery
Formica fusca subsericea Say
Formica pallide-fulva schaufussi incerta Emery
Formica pallide-fulva nitidiventris fuscata Emery
Formica pallide-fulva schaufussi dolosa Wheeler
Formica pallide-fulva succinea Wheeler
Lasius niger americanus Emery
Dorymyrmex pyramicus Roger
Dorymyrmex pyramicus flavus McCook

Two species, *Trachymyrmex septentrionalis obscurior seminole* Wheeler and *Dorymyrmex pyramicus flavus* McCook, were very common ants in the Mississippi Embayment region and were collected only in this region by the writer. Dr. C. H. Kennedy took these species in the bottom land of Townsend Valley, east of the Chilhowie Range. The valley is protected on the north and west by mountains and the temperature is higher than in locations without this protection from the west and northwest storms. This fact probably explains the presence of these species in East Tennessee.

DETAILED NOTES ON INDIVIDUAL SPECIES

FAMILY FORMICIDAE

Subfamily Ponerinae

Genus *Stigmatomma* Roger

Stigmatomma pallipes Haldeman

Typhlopone pallipes Haldeman, Proc. Acad. Nat. Sc. Phila., 2: 54, 1844.

Although very rare in all other sections of the state, this ant was common on the top of the high mountain peaks near Greenville. They were found nesting both in exposed and shady situations. The nests were in the ground and were covered by a stone or rock. This species was taken once in the valley near Tusculum College.

W. W. Wheeler gives the range of this ant from eastern Canada to eastern Texas. For a description of the ant and of its habits and nests see Wheeler's "Habits of *Ponera* and *Stigmatomma*," Biological Bulletin, Vol. 2, No. 2, pp. 43-69, 1900.

The reason this species is so common on top of the high mountains is probably due to the fact that these mountain peaks are in the fog belt and the humidity is high at all times. The one collection made in the valley was on a steep north slope in a very dense and damp woods.

Dr. C. H. Kennedy says that this species is common in northern Ohio, in flat, moist woods. Thus it appears that the degree of moisture is the factor that limits the distribution of this species.

Localities: Tusculum College, Cold Spring, Laurel Bald and Graystone Mountains, all near Greeneville.

Genus *Sysphincta* Roger

Sysphincta pergandei Emery

Sysphincta pergandei Emery, Zool. Jahrb. Syst., 8: 264, 1895.

Only one specimen of this rare ant was found. It was taken under a large, deeply imbedded rock at the foot of Graystone Mountain near Greeneville.

Wheeler lists this ant from the Atlantic States and M. R. Smith has it in his list for Mississippi. It has been collected in southern Ohio (Wesson, Kennedy and Schramm collections). From the literature it seems to be very rare everywhere.

It is probably much more common but is a subterranean ant that is found only accidentally as there are no surface indications of its nests.

It can be easily recognized by the tip of the gaster being strongly deflected forward.

Locality: Graystone Mountain, near Greeneville.

Genus *Proceratium* Roger

Proceratium silaceum Roger

Proceratium silaceum Roger, Berlin, entom. Zeitschr., 7: 172, 1863.

This species was collected only in the Tennessee Valley. It seems to prefer well rotted logs or stumps in very shady woods. In every case the wood was decayed to a stage where it could be easily pulled apart by the hands. The ants are very slow moving and the colonies rather small; the largest colony collected consisted of 21 specimens.

According to Wheeler the range of this ant is the Atlantic States, but it is also listed by M. R. Smith from Mississippi and it has been collected in southern Ontario, northern and southern Ohio and in Missouri (C. H. Kennedy collection).

Since the nests are in wood that is decayed almost to powder, it was impossible to determine much about the structure of the nest because it was always destroyed before the ants were noticed.

Tennessee is evidently close to the southern limit of its distribution. It is rather common in the Northern States and it seems apparent that temperature is the controlling factor in the distribution of *silaceum*.

Localities: Tusculum College; Cold Spring Mountain, near Greeneville.

Genus **Euponera** Forel**Euponera gilva** Roger

Ponera gilva Roger, Berlin, entom. Zeitschr, 5: 170, 1863.

This species was taken only twice, both collections were made near Tusculum College. The nests were always in well rotted logs. The ants are very timid and hide at the first opportunity after being disturbed. They appear at first sight much like *Proceratium*.

It is listed from "North America," by Wheeler. The writer was unable to find it listed in any of the Northern States lists and only from Mississippi and Tennessee in the south.

Locality: Tusculum College. (Also Kennedy at Montvale Springs.)

It was taken in very damp situations each time, and the decayed wood was well saturated.

For description of this ant see "Notes on *Euponera gilva* (Roger)," by Wm. S. Creighton and George S. Tullock, Psyche, Vol. 37, No. 1, pp. 71-79, 1930.

Genus **Ponera** Latreille**Ponera coarctata** Latr. subsp. **pennsylvanica** Buckley

Ponera pennsylvanica Buckley, Proc. Entom. Soc. Phila., 6: 171, 1866.

This species is one of the very common ants of the state, being found on every collecting trip. It seems to be equally as common on the tops of the mountains, at an elevation of 6,000 ft., as any other situation. It nests in the ground as well as in wood. The nests in the ground are always under rocks or stones, and when nesting in wood it is generally found in the logs that are well decayed.

It is reported from Canada, North Eastern States, Kansas, Illinois, Florida, Mississippi, and North Carolina.

Wheeler says they prefer open and dry situations, but I have taken them in stumps in very dense woods at Ripley, Tenn.

For further data on their habits see Wheeler's "Habits of *Ponera* and *Stigmatomma*," Biological Bulletin, Vol. 2, No. 2, pp. 43-69, 1900.

Localities: Tusculum College, Mosheim, Greeneville, Morristown, Chuckey, Ripley, Slabtown.

Ponera trigona Mayr var. **opacior** Forel.

Ponera trigona Mayr var. *opacior* Forel, Trans. Ent. Soc. London, p. 363, 1893.

Although not common, this ant is distributed widely in the state, only seeming to be absent on the tops of the mountains. It was taken on the dry ridges at an elevation of 2,800 ft. Its nests were found both in the ground under rocks, and in logs or stumps. This variety is much more timid than the subsp. *pennsylvanica* and as soon as the nest is disturbed, hide under the first object available. It is found where there is plenty of moisture.

Type locality: Texas. Tennessee seems to be the farthest point north from which it has been reported.

This is a southern form of *Ponera* and temperature must be the limiting factor in its distribution.

For habits and nests see Wheeler's "Habits of *Ponera* and *Stigmatomma*," *Biological Bulletin*, Vol. 2, No. 2, pp. 43-69, 1900, and "Ants of the Genus *Ponera* in America North of Mexico," by Smith. *Annals Ent. Soc. Amer.*, Vol. 29, No. 3, pp. 420-430, 1936.

Localities: Tusculum, Johnson City, Brownsville, Princeton, Murfreesboro, Nashville.

Subfamily **Dorylinae**

Genus **Eciton** Latreille

Eciton schmitti Emery

Eciton schmitti Emery, *Jahrb., Abth. f. Syst.*, 8: 258-259, 1894.

This species was collected by Dr. C. H. Kennedy at Montvale Springs, near Maryville. The ants were scattered through a well decayed log in which there was a nest of *Aphenogaster* and *Lasius*.

Wheeler lists this species "Texas to Missouri and Colorado" and also from N. Carolina. M. R. Smith reports it from Mississippi.

It appears to be a southern form and although it may be more widely distributed than reports show it is probably absent from the northern states because of low temperature.

Locality: Montvale Springs, near Maryville.

Eciton carolinensis Emery

Eciton carolinensis Emery, *Zool. Jahrb.*, 8: 259-260, 1895.

This ant was collected only in East Tennessee. It was most often taken on the stony hillsides or a few hundred feet above the base of the mountains where rocks were numerous. *Carolinensis* was never seen above ground and it is the writer's opinion that they do most of their foraging at night and perhaps, as some species of *Eciton*, never come to the light. One colony found late in the fall was very large, probably numbering about 50,000 workers.

The type locality is North Carolina. M. R. Smith gives its range as the Gulf and South Eastern States to North Carolina at least. North Carolina and Tennessee are probably very close to the northern limit of its distribution. Here again temperature appears to be the factor limiting distribution, because north of its range all the other factors except high temperature are present.

For a description of the interesting habits of the species close to *carolinensis*, see Chapt. 15 of "Ants," by W. M. Wheeler, Columbia University Press.

Localities: Tusculum College, Graystone Mountain, Cold Spring Mountain, Walkertown. Townsend, a nest with queen by Kennedy.

Subfamily **Myrmecinae**

Genus **Myrmecina** Fabr.

Myrmecina graminicola Fabr. subsp. **americana** Emery

Myrmecina latreilli subsp. *americana* var. *brevispinosa* Emery, *Zool. Jahrb. Abth., of Syst.*, 8: 271, 1894.

Although not common this ant was taken in the eastern, central and western portions of the state. It was found nesting in the ground under rocks and in logs, and with few exceptions it was taken in very moist situations.

It is recorded from the North Eastern States, North Carolina and Illinois. It does not seem to be abundant anywhere in the United States.

This timid and slow moving ant has the interesting habit of feigning death when disturbed. Its nests in logs are generally in the center of the log where there is plenty of moisture. The colonies are small, always under 25 workers.

This is a northern form and North Carolina is probably its southern limit of distribution. The two nests taken in the Mississippi Embayment region were in large damp logs in very dense woods. Obviously temperature is the factor determining its distribution.

Localities: Tusculum, Cold Spring Mount in, Tiptonville, Ripley, Murfreesboro.

Genus *Monomorium* Mayr

Monomorium pharaonis Linnaeus

Formica pharaonis Linnaeus, Syst. Nat. 2, p. 963.

One collection of this ant was made at Ripley, Tenn. It was found running on the wash stand in a hotel room.

Wheeler says about this species, "It lives only in houses, warehouses, ships, etc., and has been carried to the different seaports of the globe from its original home in the warmer regions of the Old World." In the paper, "The Ants of Victoria County, Texas," by J. D. Mitchell and Dwight Pierce, Proc. Ent. Soc. of Washington, Vol. 14, pp. 67-76, 1912, the following is said about *pharaonis*, "This introduced ant has not only been a bad pest in the house, but has also been found nesting in the woods under bark of pecan and elm logs and also under the bark of a live pecan tree (Mitchell). This species has been taken attacking the immature stages of the boll weevil (W. W. Yothers).

It is evidently widely spread in the United States.

Locality: Ripley.

Monomorium minimum (Buckley)

Myrmica (Monomarium) minima Buckley, Proc. Ent. Soc. Phila., pp. 335-350, 1967.

With the exception of the highest mountain peaks this ant was found widely distributed throughout the state. In the Nashville region it is especially common. It builds its nests both in the ground and in stumps and logs. The nests in the ground are generally under a rock or stone but in some cases it opens to the surface without a covering.

One interesting fact concerning this species is the fact that each colony of considerable size may have many nest queens. Some nests were investigated that contained as high as 12 to 15 nest queens.

Wheeler gives its distribution as Atlantic States, Southern States and Texas. It is reported by Wm. P. Hayes in "A Preliminary List of the Ants of Kansas." So its distribution probably includes the middle west also, and it has been reported recently from the Pacific Coast.

This little black ant is a common house-infesting species in Tennessee, and not only is fond of sugar, jams and jellies, but will also eat meat, butter and greasy foods.

Localities: Tusculum, Morristown, Chuckey, Tiptonville, Ripley, Murfreesboro, Nashville.

Genus *Solenopsis* Westwood

Solenopsis molesta Say

Myrmica molesta Say, Bost. Soc. Journ. Nat. Hist., 1: 290, 1836.

This is a very common ant in all of Tennessee with the exception of the very tops of the highest mountain peaks. It was taken a few times at 5,000 ft. elevation.

It nests either in wood or the ground. Many times it nests in the walls separating the galleries of the formicaries of larger ants and steals food and even devours the larva and pupae of the other ants. It nests either in open or shady situations.

It is reported from the North and Eastern States by Wheeler and from South Carolina by Smith. South Carolina seems to be its southern limit of distribution.

For notes on habits and nests of this ant see "The Ants of New Jersey," by Wheeler. American Museum of Natural History, Vol. 21, Art. 33, pp. 371-403, 1905.

They were not found on the tops of the high mountains due, perhaps, to the fact that these peaks are within the fog zone and the ground is always very moist. They prefer open dry situations and moisture along with temperature is without a doubt the factors that limit its distribution.

Localities: Johnson City, Graystone Mountain, Cold Spring Mountain, Tiptonville, Ripley, Brownsville, Murfreesboro, Nashville, Slabtown.

Genus *Pheidole* Westwood

Pheidole morrissi Forel.

Pheidole morrissi Forel, Comptes-rendus, Soc. Entom. de Belgique. Seance du 6 fevrier, 1886.

Only three nests of this *Pheidole* were found. One nest was collected at Tiptonville in the Mississippi Embayment region and two in the Tennessee Valley. Its nests are built in the open and are very easy to locate, so on this account the writer believes that this species is rather rare in the localities collected over.

It is reported from Texas, Florida, North and South Carolina, New Jersey and southern New York.

It prefers pure sand for its nesting site according to Wheeler, and from other literature they are always found in sandy soil. The col-

lections made in Tennessee were both in very sandy loam and each had constructed a mound, one of which was about four inches high and ten inches across.

The workers and soldiers are very vigorous, rushing out when the nest is disturbed and attacking the forceps and the collector's hands, giving very noticeable bites. The nest extends at least two feet into the ground.

It appears that in the case of *morrisi* the substratum is an important factor in its distribution. Since the range of temperature, as well as rainfall and other factors, between Florida and New York is very wide, the substratum seems to be the only factor which is constant.

Localities: Graystone Mt., Cold Spring Mt., Tiptonville.

***Pheidole dentata* var. *commutata* Mayr**

Pheidole dentata var. *commutata*, Zool. Jahrb. Syst., 8: 295, 1895.

This species is a very common form of *Pheidole* in all of Tennessee with the exception of the mountains. Unlike *vinelandica* it prefers the shady environment and with the exception of two nests it was always found in the woods. Of these two, one nest was in a meadow, the other in a soy bean field.

These are very active ants, but are not as pugnacious as *morrisi*.

The species is listed from North and South Carolina, Mississippi, Florida and Texas. Tennessee seems to be the farthest north it has been reported, but no doubt will be found farther north, especially in the Mississippi Embayment region.

This is a southern form which probably is in the Tennessee Valley, due to the protection from severe winter weather afforded by the mountains to the north and west.

Localities: Greeneville, Tusculum, Knoxville, Morristown, Tiptonville, Ripley, Brownsville, Princeton, Murfreesboro, Slabtown.

For notes on their habits see "Ants of Victoria County, Texas," by J. D. Mitchell and W. Dwight Pierce, Proc. Ent. Soc. Washington, Vol. 14, p. 67, 1912.

***Pheidole crassicornis* Emery**

Pheidole crassicornis Emery, Zool. Jahrb. Syst. 8: 289, 296, 1895.

Although far from common, this species was taken in all three sections of Tennessee. It was never found above the foot of the mountains. Nests were always in the ground but not always covered. A very large nest was taken in a potato patch at the foot of Coldspring Mountain near Greeneville, and the opening to the nest was surrounded by a low crater. However, the most of the nests are under rocks or logs.

This species is reported from North and South Carolina, Mississippi and other southern states.

It obviously is a form that requires high temperature, and Tennessee is perhaps very near its northern limit of distribution.

This ant can very readily be distinguished from the other *Pheidoles* by its distinctly flattened antennal scape.

Localities: Graystone Mt., Cold Spring Mt., Murfreesboro, Brownsville.

***Pheidole tysoni* Forel**

Pheidole tysoni Forel, *Annals de la Soc. Entom. de Belgique*, 11: 384, 1901.

Dr. C. H. Kennedy collected this ant in the first cultivated area west of and below the Chimney Peaks in the Great Smoky Mountains. His field notes read, "Nest a scattered affair not over 2 inches deep but covering a square yard. Seeds stored in rooms the size of a sparrow egg. Brood in smaller chambers. Chambers connected by minute galleries."

Wheeler lists this ant from New York to North Carolina. It has been taken in southern Ohio (Kennedy collection).

This is a northern form. The collection made in North Carolina was near Bat Cave in Henderson County and there the altitude is more than 4,000 ft. Temperature is undoubtedly the factor which limits the distribution of the species and it is found in North Carolina due to the low temperature afforded by the altitude of the mountains.

Locality: Chimney Peaks, Gatlinburg.

***Pheidole vinelandica* Forel**

Pheidole bicarinata race *vinelandica*, *Comptes-rendus la Soc. Entom. de Belgique*, Seance du 6 fevrier, 1886.

This is a very common species found in open situations in all parts of the state with the exception of the mountains. In some regions it was the most abundant species encountered. It was collected a great many times and was always taken in open fields with but one exception. One nest was found in a stump in a very open woods near Ripley.

It is recorded from Kansas, New Jersey, New York, North and South Carolina and Mississippi.

The colonies are never large (average about 125 workers) but are very numerous. The opening to the nest is generally surrounded with a low, regular crater. The runways extend from 10 to 18 inches down and pockets of these runways contain small seeds of various grasses, weeds, etc., which are used as food.

Localities: Tusculum, Johnson City, Cold Spring Mt., Jackson, Tiptonville, Ripley, Brownsville, Nashville.

Genus *Crematogaster* Lund***Crematogaster lineolata* Say**

Myrmica lineolata Say, *Boston Jour. Nat. Hist.*, 1: 290, 1836.

This is a very common species in Tennessee from the high mountain peaks to the lowlands along the Mississippi. According to M. R. Smith they range throughout all parts of the United States.

They seem to prefer nesting in wood but were found under stones several times. There is a tendency in this ant to build carton-like structures in their nests.

They were very scarce in the moist situations and it appears that they prefer a dry habitat.

In Wheeler's paper on "Habits of the Tent Building Ant," *Bulletin American Museum Natural History*, Vol. 22, pp. 1-18, 1906, can be

found examples of construction of the "cow sheds," characteristic of this ant.

Localities: Tusculum, Graystone Mt., Chuckey, Jackson, Brownsville, Princeton, Laurel Bald Nt.

***Crematogaster lineolata* var. *cerasi* Fitch**

Myrmica cerasi Fitch, Trans. N. Y. State Agri. Soc., 14: 835, 1854.

This was taken only in the Cedar Glades near Nashville. Wheeler gives the North Atlantic States as the range of this ant, and it has been reported from Illinois by Miss Talbot.

This is a northern type of *Crematogaster* and probably Tennessee is about the southern limit of its distribution.

It was found nesting in a log and its nest appeared much as that of *lineolata*.

Locality: Nashville.

***Crematogaster leviuscula* Mayr**

Crematogaster leviuscula Mayr, Verh. k. k. Zool. bot. Gesell. Wein, 20: 993.

Although rather rare, this species is widely distributed in the state. It was collected once in the Mississippi region, once in the Nashville Basin and twice in East Tennessee. It was not taken on the mountains.

It is reported from North Carolina, Mississippi and Texas. It evidently is a southern form with Tennessee perhaps marking its northern limit of distribution.

It feeds on honey dew and there is generally a line of the workers moving up and down a tree in the vicinity of the nest, going for and carrying back this material. Wheeler states that he has found this species nesting in the galls of the *Cynipid*, *Holcuspis cinerosus*, on oak in Texas. Most all the *Crematogaster*s are fond of honey dew and the distribution may depend on the distribution of the insect they attend, and it appears that temperature must also be a factor in the distribution.

Localities: Nashville, Tusculum, Cold Spring Mt., Ripley.

***Crematogaster leviuscula* var. *clara* Mayr**

Crematogaster leviuscula var. *clara* Mayr, Verh. k. k. Zool. bot. Gesell. Wien, 20: 993.

A great number of these ants were found running up and down a large tulip tree on the Tusculum College Campus. Although the region was searched closely for the nest it could not be found, and no doubt it was in a decayed portion of the tulip tree some 20 feet above the ground. It differs from *leviuscula* in that it is larger and the head, thorax, pedicel and appendages are a yellowish red color.

It is reported from Mississippi, Kansas and Texas. It has similar food and nesting habits as *leviuscula*. This is a southern form also and what applies to *leviuscula* probably would apply to this variety.

Locality: Tusculum.

***Crematogaster opaca depilis* var. *punctulata* Emery**

Crematogaster punctulata Emery, Zool. Jahrb., Abth. f. Syst., 8: 287, 1894.

Only one nest of this *Crematogaster* was taken. It was located in a stump in the Cedar Glades near Nashville. Wheeler lists it in his *Ants of North America "Colorado to Texas"* and M. R. Smith reports it from Florida.

This appears to be a variety far out of its natural range and may be due to the fact that the region of the Cedar Glades is limestone with underground drainage which makes for a very dry area, approaching perhaps the dry area of Texas and the sandy well drained areas of parts of Florida. Another explanation might be that if this variety attends plant lice, as a great many of the *Crematogasters* do, the plant lice attended might be in these Cedar Glades and not in the surrounding territory.

The nest looked much as the nest of *lineolata*.

Locality: Nashville.

♂ ***Crematogaster victma* subsp. *missouriensis* Pergande**

Crematogaster victma subsp. *missouriensis* Pergande (Emery), Zool., Abth., f. Syst., 8: 287-288, 1894.

Although taken in the eastern, central and western portions of the state this ant was far from common. It was found nesting in the ground in every case, and in locations where there was good drainage. Nests were found both in sand and clay loam and always in open situations. They are very shallow and the colonies were small, not over 75 workers in a colony. The workers are very slow in their movements and when exposed to the light seem to be blinded.

M. R. Smith reports them from South Carolina and Mississippi, and Wm. P. Hayes from Kansas.

Localities: Tusculum, Chuckey, Jackson, Nashville.

Genus ***Stenamma*** Westwood

***Stenamma brevicorne* subsp. *diecki* Emery var. *impressum* Emery**

Stenamma westwoodi subsp. *diecki* Emery var. *impressum* Emery, Zool. Jahrb. Abth. f. Syst. Bd., 8: 298, 1894.

This ant was collected several times by Dr. C. H. Kennedy near Indian Gap, at the top of the Great Smokies. The nests were found both in the ground under stones and in rotting wood. The altitude at Indian Gap is around 5,200 feet.

This species is listed by Wheeler from New York and Vermont.

Here is another species whose range is far to the north, but due to the low temperature provided by the altitude seems to be, at least in this region, rather common.

Locality: Gatlinburg.

Genus ***Aphenogaster*** Mayr

***Aphenogaster treatae* Forel**

Aphenogaster treatae Forel, Comptes-rendus de la Soc. Entom. de Belgique. Séance du 6 fevrier, 1886.

Although this species is not very common, it is widely distributed in the state, being taken in the eastern, central and western parts.

It evidently is adapted to a wide variety of habitats, since it has been reported from Connecticut, Ohio, Illinois, Kansas, North and South Carolina, New Jersey, New York and Mississippi.

There seems to be a difference of opinion among the different collectors as to the habits of this species. Davis and Bequaert in their list of the ants of Staten Island and Long Island, N. Y., give their nesting place as in the sand in open woods. This in part is the observation of the writer in regard to those taken in Tennessee, in every case they were either in open fields or in very open woods. W. M. Wheeler and M. R. Smith agree that they nest in the shade. Of those taken in Tennessee one-half or more of the colonies were taken in oak stumps which is rather interesting in view of the fact that they are mentioned by the other collectors as nesting in the ground, and Wheeler in "The Ants of North Carolina" says, "never in logs."

The nests in the stumps are much like that of *fulva* or *picea*, while those in the ground have a small crater with the pellets of material from the nest scattered away from the entrance to a distance of 10 to 12 inches. The nest extends into the ground some 12 or 18 inches, with brood pockets very numerous near the top of the soil.

Perhaps the temperature itself or its effect on the amount of moisture is the factor which causes this species to build in some localities in the open and in others in the shade.

Localities: Ripley, Brownsville, Nashville, Tusculum.

Aphenogaster lamellidens var. **nigripes** Smith

Aphenogaster lamellidens var. *nigripes* Smith, Ent. News, 34: 308, 1923.

This variety differs from the species *lamellidens* in the color of its legs being distinctly darker. Their habits seem to be the same. With the exception of *fulva* this is the most common *Aphenogaster* in Tennessee. It is not found at an altitude above 2,500 ft. in the mountains but was taken in all three sections many times. It was collected in many types of forests and subsoils and with one exception it was always taken in logs or stumps. The exception was a nest in the base of a brick chimney at the writer's home.

The species *lamellidens* is reported from South and North Carolina, southern Ohio, and New Jersey. W. M. Wheeler reports *lamellidens* nesting in sand in New Jersey (evidently near its northern limit of distribution) while everywhere else it is reported nesting in wood. The absence of this ant in the mountains seems to be due to low temperatures because it was found in many types of forests, subsoil, in open and shady situations as well as wet and dry situations.

Localities: Mosheim, Graystone Mt., Cold Spring Mt., Tiptonville, Brownsville, Princeton, Murfreesboro, Slabtown, Tusculum.

Aphenogaster fulva Roger

Aphenogaster fulva Roger, Berlin, Entom. Zeitschr., 7: 190, 1863.

Fulva is another species which, though not common, has a very wide range of distribution in the state. It was taken along the

Mississippi River and on top of the high peaks of the Smokies, in dense forests and in open grassy fields, in logs and under rocks, in sand and in clay. They seem to be adapted to most any environmental conditions prevailing in Tennessee.

They are reported from South and North Carolina, Ohio, New Jersey, Illinois, Mississippi and Connecticut.

Its nests, both in wood and in the ground, are very similar to *aquia*.

Localities: Chuckey, Cold Spring Mt., Ripley, Brownsville, Laurel Bald Mt., Tusculum, Slabtown, Tiptonville.

***Aphenogaster fulva* subsp. *aquia* Buckley**

Myrmica (Monomarium) aquia Buckley, Proc. Ent. Soc. Phila., p. 341, 1866.

This subspecies of *Aphenogaster* was taken on every collecting trip. Although it was not abundant on the high mountains it was taken there several times. In every other situation it was very abundant, and in some localities nearly every log had at least one colony nesting in it and there were many colonies nesting in the ground under rocks and stones.

Evidently this *Aphenogaster* is adapted to a wide range of ecological factors. It has been reported from Connecticut, Ohio, Illinois, North Carolina, Mississippi and Florida.

The nest in the log consists of many connecting runways and portions expanded for the brood. In the large logs it is generally located in the upper portion so that when the brood is brought up near the surface, generally just under the bark, it is exposed to a higher temperature. In the smaller logs where the heat can penetrate through it, the nest may be all through the log and extending into the ground beneath. The nests under rocks and stones do not extend far into the ground and the runways and brood pockets are arranged much as they are in the log. The brood is brought under the rock or stone where it is exposed to higher temperatures than in the ground.

Localities: Tusculum, Graystone Mt., Cold Spring Mt., Morristown, Chuckey, Brownsville, Murfreesboro, Slabtown, Ripley.

***Aphenogaster fulva aquia* var. *picea* Emery**

Aphenogaster fulva aquia Buckley var. *picea* Emery, Zool. Jahrb. Syst., 8: 304, 1895.

The variety *picea* was taken only on the mountains at an altitude of 3,000 ft. or more and was most abundant on the top of the highest peaks at an altitude of about 6,000 ft. It was found both in logs and under rocks in the woods and in the grassy-bald situations. W. M. Wheeler reports it from Black Mountain, N. C., while M. R. Smith lists it as being collected from the ground in a dense patch of woodland at Rara Avis, Miss.

This is a common variety in Ohio, Illinois and Connecticut, found in shady woods and the writer believes that this is a northern form that is found in situations where the temperature is rather low and humidity high. In the mountains these conditions are present; therefore, the distribution in Tennessee is limited to the mountains. The colony found by M. R. Smith in Mississippi was in a dense woods and

the conditions of temperature and humidity might have been favorable, yet there is a possibility that this colony might be a different variety physiologically.

The nests of *picea* seem to be very much like *aquia* in all respects.

See Adele M. Fielde's paper, "Proceedings of Academy of Natural Science of Philadelphia," Vol. 53, pp. 425-449, pp. 521-544.

Localities: Cold Spring Mt., Laurel Bald Mt.

***Aphenogaster fulva aquia* var. *rudis* Emery**

Aphenogaster fulva aquia Buckley var. *rudis* Emery, Zool. Jahrb. Syst., 8: 305, 1895.

This variety of *Aphenogaster* was taken only once. The nest was in a stump in a dense oak-elm woods. The workers were very timid and the colony was small. This ant seems to be rare as the only other collections for this territory are by W. M. Wheeler, who reports it from North Carolina, and C. H. Kennedy from Ohio. Until more collections are made little can be said about the ecological factors affecting its distribution or its habits.

Locality: Murfreesboro.

***Aphenogaster texana* var. *carolinensis* Wheeler**

Aphenogaster texana var. *carolinensis* Wheeler, Bull. Amer. Mus. Nat. Hist., 34: 414, 1915.

The Mississippi Embayment region was the only region in which this variety was taken. It was not common, being collected only three times. It was taken by C. H. Kennedy under a stone at Montvale Springs near Maryville, Tenn., where the altitude is around 1,500 feet. Since *texana* is a common species farther south and this variety is reported from South Carolina and Mississippi but not from Florida, where *texana* is very common, it appears that this is the northern variety of a southern species. Temperature is probably the limiting factor of its distribution because it seems to be the only variable one.

It nests both in wood and in the ground. M. R. Smith says it is very common throughout South Carolina, nesting under stones, while those taken in western Tennessee were in rotting stumps. The nests in the wood were very similar in construction to those of *aquia*.

Localities: Tiptonville, Ripley.

***Aphenogaster tennesseensis* Mayr**

Atta tennesseensis Mayr, Verh. Zool. bot. Ges. Wien, 12: 743, 1863.

Although this species bears the name *tennesseensis* it is by no means common in that state. It was collected several times but only in the eastern part. It is much more common in Ohio, Illinois and other northern states. W. M. Wheeler says, "These aberrant females probably establish their colonies in nests of *Aphenogaster fulva*. At least *tennesseensis* is known to occur only in regions where *fulva* is unusually abundant and several mixed colonies of the two species, containing queens of *tennesseensis* only, have been recorded."

This is no doubt a northern form whose southern limit of distribution

is about Tennessee and North Carolina, where the altitude lowers the temperature to much like that of the northern states.

When living in unmixed colonies it always nests in rotting wood, and in the mountains was more often found under the bark of a standing dead chestnut.

Localities: Tusculum, Graystone Mt., Morristown, Chuckey.

Genus **Myrmica** Latreille

Myrmica punctiventris subsp. **pinetorum** Wheeler

Myrmica punctiventris subsp. *pinetorum* Wheeler, Bull. Amer. Mus., 21: 389, 1905.

Only one nest of this ant was taken. It was found in a small log in a dense oak-chestnut woods near Tusculum College. A few strays were taken at the base of Yost Mountain in a stump.

W. M. Wheeler in his "List of North American Ants," gives the range of this species as North Atlantic States. So far as can be determined this is the first time it has been reported south of New Jersey. Davis and Bequaert says, "This is the form of the pure sand of the pine barren region."

The nest was in a small log and the runway undoubtedly extended into the ground beneath, but the brood was in a small excavated place in the log.

This is a northern species which has been able to establish nests in this mountain area where temperatures do not go so high.

Localities: Tusculum, Greeneville.

Myrmica rubra L. subsp. **brevinodis** Emery

Myrmica rubra subsp. *brevinodis* Emery, Zool. Jahrb. Syst., 8: 312, 1895.

This species was collected by Dr. C. H. Kennedy at Montvale Springs near Maryville. The altitude there is around 1,500 ft. He also took it in Adams County, Ohio.

The nest taken at Montvale Springs was located between two flat rocks, with the walls of the nest composed of cedar needles and organic trash. The surface of the rocks where the nest was located was moist.

This species is listed by Wheeler from Colorado.

Until more collections of this ant are made little can be said about its biology.

Locality: Montvale Springs, near Maryville.

Myrmica rubra subsp. **scabrinodis** Nyl. var. **fracticornis** Emery

Myrmica rubra subsp. *scabrinodis* Nyl. var. *fracticornis* Emery, Zool. Jahrb. Syst., 8: 313.

This ant was collected by Dr. C. H. Kennedy in the first cultivated area below the west of Chimney Peaks and at Montvale Springs. The collection at Chimney Peaks was a stray ant, but a nest was taken at Montvale Springs. The nest was under a stone.

This species is rather common in the Northeastern States and this is the farthest point south it has been reported. Here as in many other cases it appears that due to the altitude afforded by the mountains, the temperature is favorable to its existence.

Localities: Chimney Peaks, Montvale Springs.

***Myrmica scabrinodis* var. *sabuleti* Meinert.**

Myrmica sabuleti Meinert, Naturv. Afg. Dansk. Vid. Selsk., 5: 55, 1860.

This *Myrmica* also was taken only twice. One nest was found in a log along a mountain trail at an altitude of about 4,500 ft. and some strays were taken under a rock on top of Cold Spring Mountain which is over 6,000 ft. in height.

This ant is listed from the Northeastern States and New Jersey. As in the case of *pinetorum* no record can be found of this ant farther south than New Jersey.

It occurs in Tennessee due perhaps to the fact that the temperature on the high mountains would approximate that of the Northeastern States.

The nest was in the bottom of the log and the galleries extended into the ground.

Locality: Cold Spring Mountain.

Genus ***Leptothorax*** Mayr***Leptothorax longispinosus* Roger**

Leptothorax longispinosus Roger, Berl. Ent. Zeitschr., 7: 180, 1863.

This species *longispinosus* was collected only in the Tennessee Valley where it was by no means common. It was found nesting in logs and under the bark of dead, standing trees. As strays it was collected on leaves of low shrubs and weeds in the woods.

It is reported from Virginia, District of Columbia, New York, Connecticut and Illinois. From this it appears that Virginia and Tennessee is about the limit of its southern distribution and Illinois its western limit.

Longispinosus seems to be a northern form which prefers low temperature and dense shade. Their food is probably the same as that of *curvispinosus*.

Localities: Cold Spring Mt., Laurel Bald Mt., Tusculum, Walkertown.

***Leptothorax curvispinosus* Mayr**

Leptothorax curvispinosus Mayr, Sitz. E. K. Akad. Wiss. Wien, 53: 1866.

This is the most common species of *Leptothorax* in the state. It was collected on nearly every collecting trip. Although not common on the mountains it was taken there several times. It is reported from the eastern states, Mississippi, South Carolina and Kansas.

It nests in hollow reeds, puffballs, nut shells, in logs, stumps and under rocks.

The workers are often found running on the leaves of weeds and low shrubs in the woods, and they are no doubt hunting for the insect secretion which drips from the trees on the shrubs and weeds beneath. The species *curvispinosus* does not seem to attend aphids.

Localities: Graystone Mt., Tusculum, Chuckey, Tiptonville, Brownsville, Murfreesboro.

Leptothorax (Dichothorax) pergandei Emery

Leptothorax (D) pergandei Emery, Zool. Jahrb. f. Syst., 8: 318, 323, 324, 1894.

The Nashville region was the only place where this ant was taken. One nest was located in a small decaying stick and in the ground under it, along Stone River at Murfreesboro. Several strays were taken in an open oak-hickory woods near Nashville.

This species has a rather wide range of distribution, being reported from Washington, D. C., North and South Carolina, Texas and Mississippi. It is no doubt a southern form with Washington, D. C., probably marking its northern distribution. Temperature appears to be the factor limiting its distribution. Smith says this is distinctly a ground nesting species.

Localities: Murfreesboro, Nashville.

Leptothorax (Dichothorax) pergandei subsp. **floridanus** Emery

Leptothorax (D) floridanus, Zool., Abth. f. Syst., 8, pp. 318-324, 1894.

This is another ant which is not common yet is distributed throughout the state with the exception of the high altitudes. It was much more abundant in the Mississippi Embayment region than anywhere else in the state. It is found in the woods generally, but in a few cases it was taken in open situations.

It is listed from Florida, North and South Carolina, and Mississippi. This ant resembles *pergandei* very closely, but while *pergandei*, according to M. R. Smith, is distinctly a ground-nesting species, *floridanus* was taken in stumps, logs and in one case from a hickory nut shell.

In this species, as in *pergandei*, we have a southern form whose distribution farther north than Tennessee or Kentucky is probably checked by low temperature. In the Mississippi Embayment region where the temperature runs higher than any other portion of Tennessee, it is common.

Localities: Graystone Mt., Morristown, Brownsville, Waverly, Murfreesboro, Nashville, Tusculum.

Genus **Strumigenys** F. Smith**Strumigenys (C) creightoni** Smith

Strumigenys (C) creightoni Smith, Annals Ent. Soc. Amer., Vol. 24, pp. 705-706, 1931.

This species of *Strumigenys* was collected only in the Tennessee Valley. Only strays were taken, twice under the bark of stumps and once under a rock.

The type locality is Spring Hill and Mobile Ala., and it is reported from Mississippi and Virginia.

For description of this and following species of *Strumigenys* see "A Revision of the Genus *Strumigenys* of America, North of Mexico, Based on a Study of the Workers," by M. R. Smith. Annals of the Entomological Society of America, Vol. 24, No. 4, pp. 686-710, 1931.

Not enough collections were made of this ant to make any statement about its biology.

Localities: Tusculum, Chuckey, Cold Spring Mt.

Strumigenys (C) pulchella Emery

Strumigenys (C) pulchella Emery, Zool. Jahrb. Syst., 8: 327, 1895.

Only one nest of this very small ant was found. It was located in a stump at the base of Yost Mountain near Greenville.

The type locality is Washington, D. C., and Beatty, Penn., but is listed from Illinois, Mississippi, Alabama, Ohio and New York.

From a description of the ant, its habits and nest, see the publication mentioned under *Strumigenys creightoni*.

Locality: Greeneville.

Strumigenys (C) clypeata Roger

Strumigenys (C) clypeata Roger, Berlin, Ent. Ztg., p. 212, 1863.

One nest of this species was taken from a well decayed pine log in a pine thicket near Tusculum.

Type locality: Louisiana. It is also listed from Pennsylvania, North Carolina, District of Columbia and Mississippi.

The nest was destroyed before the ants were noticed. The log was decayed to a wet punky state. No other data is available on the habits of this species.

Locality: Tusculum.

Strumigenys (C) louisianae subsp. **laticephala** Smith

Strumigenys (C) louisianae subsp. *laticephala* Smith, Annals Ent. Soc. Amer., Vol. 24, pp. 690-691, 1931.

Only one nest of this ant was taken. It was located near Murfreesboro at the bottom of a small dead tree which I broke off some ten inches below the ground. The nest was in a small knot hole near the break and the colony consisted of a nest queen and 25 workers.

Type locality: Long View, Miss., and also reported from Alabama.

This is a southern form of *Strumigenys* and Tennessee, perhaps, marks its northern limit. Temperature here also is obviously the limiting factor in the distribution of the species.

For a description of this ant and its habits see publication mentioned under *creightoni*.

Locality: Murfreesboro.

Strumigenys (C) dietrichi Smith

Strumigenys (C) dietrichi Smith, Annals Ent. Soc. of Amer., Vol. 24, p. 698, 1931.

This species was taken several times in the Tennessee Valley only. In every case it was nesting in a log or stump.

Type locality: Lucedale, Mississippi. The writer is unable to find any other record of it.

These are very small and slow moving ants with very few workers in a colony, so are very easily overlooked; for this reason it is probable that this species is much more widely distributed than the records show.

Localities: Graystone Mt., Cold Spring Mt., Chuckey, Walkertown.

Strumigenys (C) rostrata Emery

Strumigenys (C) rostrata Emery, Zool. Jahrb. Syst., Vol. 8, p. 329, 1895.

This species was taken several times in the Tennessee Valley. The nests were in logs or stumps.

Type locality: Washington, D. C., also listed for Virginia, Maryland, New Jersey, California and Alabama.

Little is known about the habits of this species. They seem to always nest in wood.

Localities: Graystone Mt., Cold Spring Mt., Tusculum.

Genus *Atta* Fabricius

Atta (*Trachymyrmex*) *septentrionalis* subsp. *obscurior* var. *seminole* Wheeler

Atta (*Trachymyrmex*) *septentrionalis* subsp. *obscurior* var. *seminole* Wheeler Jr. N. Y. Ent. Soc., Vol. 19, p. 247, 1911.

This is a very common ant and was taken in the moist, densely shaded localities of the western Mississippi Embayment region. The nests are always in the ground and in the early spring can be located by a very characteristic crescent shaped pile of dirt which they have carried to the surface. This mass of earth may be as much as 18 or 20 inches away from the small opening to the nest.

Two strays collected by Kennedy in Happy Valley, Blount County, and many crescent mounds observed in bottom land cornfield at Townsend, Blount County. Both localities protected on north by Chilhowie Range, 2,000 ft. high.

The ants are very slow moving and timid and when disturbed hide under the first available leaf or particle of dirt.

This species is reported from Florida and Mississippi. Miami, Fla., is the type locality.

For a description of habits and nests of this ant see "An Annotated List of the Ants of Mississippi," by M. R. Smith. Entomological News, Vol. 35, 1924.

This is a southern form which requires a high temperature and plenty of moisture for the raising of the fungus which is their only article of food.

It will no doubt be found to occur in southern Kentucky and perhaps farther north along the Mississippi.

Localities: Ripley, Brownsville, Princeton.

Subfamily *Dolichoderinae*

Genus *Dolichoderus* Lund

Dolichoderus taschenbergi Mayr

Hypoclinea taschenbergi Mayr. Myrm. Beitr. in den Sitzungsber. der k. Akad. der Wissensch., Wien, 53, 1866.

One specimen of this ant was taken in a stump at the foot of Quaker Knobs near Chuckey, Tenn.

It is reported from Mississippi, Louisiana and North Carolina. M. R. Smith says that the habits of this ant are similar to those of *Dolichoderus mariae* Forel. Of these he says, "It constructs its nest in the soil at the base of broom straw grass, *Andropogon* sp., or more occasionally about the roots of small bushes. The colonies are very

large, consisting of thousands of individuals. Not only are the ants fond of honey dew but they also like insect food. The workers have a habit of crawling up and down trees in files."

In the Kennedy collection are specimens from southern Ohio and western New York.

Locality: Chuckey.

Genus *Dorymyrmex* Mayr

Dorymyrmex pyramicus Roger.

Dorymyrmex pyramicus Roger, Berlin, Entom. Zeitschr. 7: 160, 1836, n. 42.

The Lion ant, as it is commonly called, was taken but twice in the state, once at Jackson in the Mississippi Embayment region and the other time at the base of Cold Spring Mt. near Greeneville. Both collections were of strays. Dr. C. H. Kennedy collected it in a sandy bottom land cornfield at Townsend, east of Chilhowie Range.

It is listed from Mississippi, New Jersey, Kansas, Florida, North Carolina, New York, South Carolina and Texas. No doubt with more collecting this ant will be found in all parts of the state.

According to Smith the nests are built in sunny spots and have a small crater about the opening.

Localities: Cold Spring Mt., Jackson.

Dorymyrmex pyramicus var. *flavus* McCook

Dorymyrmex pyramicus var. *flavus* McCook, Comstock: Rep. Cotton-worm, 1879, p. 188, n. 2.

On the sandy hills and well drained situations of West Tennessee, this ant was rather common. On top of some of these low sandy hills near Jackson many hundreds of these craters could be counted. These hills have an open growth of tulip poplar on them and the ants were attending aphids in these trees.

This species is reported from Florida, North Carolina, Mississippi, South Carolina, Texas and Kansas. Dr. C. H. Kennedy collected it in sandy bottom-land cornfield at Townsend, east of Chilhowie Range. It is a southern form, but will probably be found farther north than Tennessee in the Mississippi Embayment region.

Since these ants are very fond of honey dew their distribution may be influenced by the distribution of the aphid they attend to some extent, but the temperature no doubt is the factor that excludes them from the northern states and the mountains.

Localities: Jackson, Brownsville, Princeton.

Genus *Tapinoma* Förster

Tapinoma sessile Say

Formica sessile Say, Boston Journal Nat. Hist., 1: 287, 1836.

Although this species is listed from most of the states from Canada to the Gulf, it is far from common in Tennessee and M. R. Smith also notes that it is very scarce in Mississippi. It was taken five times in Tennessee and each time in the Highland portion. It nests in the ground generally under a rock, small logs or bark of trees.

It appears to be a northern form that manages to survive in certain portions of the south where conditions are right. The writer found it only in very moist localities where no doubt the temperature approximated that of the northern states where it is very common.

For excellent descriptions of habits and nests of this ant see "The Biology of *Tapinoma sessile* Say, an Important House-Infecting Ant," by M. R. Smith. *Annals Entomological Society of America*, Vol. 21, pp. 307-329, 1928.

Localities: Tusculum, Cold Spring Mt., Chuckey.

Genus *Iridomyrmex*

Iridomyrmex pruinosus var. *analis* André.

Iridomyrmex pruinosus var. *analis* André, Rev. Ent., p. 148, 1893.

This variety of *Iridomyrmex* was found in all sections of the state with the exception of the mountains. It was especially abundant in the sandy region in the Mississippi Embayment region, where it was probably the most common species. In the Tennessee Valley it was abundant enough to be taken on every collecting trip, but was absent above the base of the mountains. It prefers the open sandy situations and with the exception of one nest found in a stump, it was found nesting in the ground. On very warm days these ants are exceptionally fast and are very difficult to pick up with forceps.

It has been reported from Mississippi, North and South Carolina and Kansas and from the sand dunes of southern Illinois.

The workers attend plant lice and scale insects and their distribution is probably dependent on the distribution of these insects.

Nests in the soil generally have a small crater around the entrance, but this is not always true. The nest in the stump looked very much like an abandoned termite nest had been taken over by the ants.

Localities: Tusculum, Graystone Mt., Tiptonville, Ripley, Brownsville, Murfreesboro, Nashville.

Subfamily *Camponotinae*

Genus *Brachymyrmex* Mayr

Brachymyrmex heeri Forel subsp. *depilis* Emery

Brachymyrmex heeri Forel subsp. *depilis* Emery, Zool. Jahrb. Syst., 7: 635, 1893.

With the exception of one locality this ant seems to be very scarce in the state. At the base and on the northern slope of Graystone Mountain near Greeneville, below 3,500 ft., it was abundant. It was collected also once on Short Mountain near Galbreath Springs.

It is reported from North Carolina, Florida, Ohio and Illinois, and Wheeler gives its range as northeastern United States.

This species attends root aphids and therefore is not often seen above ground. They were found nesting in decaying stumps and in the ground under stones. The nests in the stumps were generally located far into the stump in the punky, well rotted portion. Their runways no doubt contact with the root aphids for their food.

Their distribution evidently is determined to a great extent on the distribution of the root aphids which they attend.

Localities: Graystone Mt., Greeneville, Galbreth Springs.

***Prenolepis imparis* (Say)**

Formica imparis Say, Boston Journ. Nat. Hist., 1: 287, 1836.

This ant is distributed throughout the state with the exception of the highest mountain peaks. In the valley it was very common. The nests are built in the soil and the ant seems to prefer clay, at least in Tennessee. Small pellets of earth are scattered around the entrance to the nest.

These ants are very fond of honey dew and other sweet material. The writer has taken them on watermelon bait when the gaster of the ant was so distended they had difficulty in running when disturbed.

They occur from New England to California, according to Wheeler.

For a complete description of their range, habits and nest see "The Ant *Prenolepis imparis* Say," by W. M. Wheeler. Annals Entomological Society of America, Vol. 23, pp. 1-26 (1930).

Localities: Tusculum, Graystone Mt., Johnson City, Morristown, Cold Spring Mt., Brownsville, Nashville.

***Prenolepis* subgen. (*Nylanderia*) *Emery parvula* Mayr**

Prenolepis parvula Mayr, Verh. Zool. bot. Ges. Wien, 20: 948, 1870.

With the exception of *Lasius niger* var. *americanus* this is the most common ant in Tennessee. It was not taken on top of the high mountains but everywhere else it was very plentiful. It nests in the ground, under stones, and also with no covering. In the latter case it makes a small crater. It was taken in logs and stumps both in open dry situations and in dense wet woods.

It is listed from most of the Northeastern States, North and South Carolina and Kansas.

It is very fond of honey dew and other sweets; discarded orange peel and watermelon rind will generally be covered with these and *Prenolepis imparis*.

Localities: Tusculum, Greeneville, Graystone Mt., Cold Spring Mt., Chuckey, Ripley, Brownsville, Princeton, Murfreesboro.

Genus ***Lasius*** Fabricius

***Lasius niger* Linnaeus var. *neoniger* Emery**

Lasius niger var. *neoniger* Emery, Zool. Jahrb. Syst., 7: 639, 1893.

It was taken only twice, both times at Tusculum. It is not reported from farther south than Blue Ridge, N. C., and it is possibly a northern form, only reaching Tennessee and North Carolina due to the altitude.

Their habits and nests seem to be the same as for *americanus*.

Locality: Tusculum.

***Lasius niger* Linnaeus var. *americanus* Emery**

Formica nigra Linn., Syst. Nat. Ed. 10a, 1: 580, 1758.

Although not as abundant as in the Northern States this is the most common ant in Tennessee. It was found on top of the mountains

well over 6,000 ft. high and in every other locality in which collections were made.

It is reported from New England, west to Kansas and south to southern South Carolina. M. R. Smith says it is not common in Mississippi and no doubt South Carolina and Mississippi is about its southern limit.

For data on nests and habits see "Habits and Behavior of Cornfield Ant, *Lasius niger americanus*," by Stephen A. Forbes, State Entomologist of Illinois. University of Illinois Agricultural Experiment Station, Bulletin No. 131.

Localities: Cold Spring Mt., Jackson, Brownsville, Laurel Bald Mt.

***Lasius umbratus* Nyl. subsp. *mixtus* Nyl. var. *aphidicola* Walsh**

Formica mixta Nyl. var. *aphidicola* Walsh, Proc. Ent. Soc. Phila., p. 310, 1862.

This variety was not common but was taken twice on top of the mountains above 6,000 ft. and twice at Jackson, which is in the Mississippi Embayment area. It was found nesting in the ground, in logs and stumps. This variety is listed from Mississippi, northern Florida, and North Carolina as well as the Northern States.

The ants depend for food on the secretion of subterranean forms of plant lice and mealy bugs, and their distribution is perhaps determined in great part by the distribution of the insects which they attend.

Localities: Cold Spring Mt., Brownsville.

***Lasius* subgen. (*Acanthomyops*) *interjectus* Mayr**

Lasius (A) interjectus Mayr, Verh. Zool. bot. Ges. Wien, 16: 888, 1886.

The eastern portion was the only place in the state where *interjectus* was found but it probably occurs in other portions since it is reported from Mississippi and South Carolina. It is common in the North-eastern States.

It was found nesting in the ground in every case, either under a rock or log. M. R. Smith says of this ant, "The workers are fond of attending subterranean plant lice, mealy bugs, etc. The ants seem to shun light and are never seen on the surface unless unearthed or exposed."

Localities: Tusculum, Graystone Mt.

***Lasius (Acanthomyops) claviger* Roger**

Formica claviger Roger, Berlin. entom. Zeitschr., 6: 241, 1862.

This species of *Lasius* was only taken three times, and each time was found nesting in the sand on the bank of the Nolichucky River near Tusculum.

It is reported from the Northern States by Wheeler but is also listed from Florida, North and South Carolina, Kansas, Illinois and Mississippi. (M. R. Smith says it is exceedingly rare in the region about State College, Miss.)

This is a very common ant in the Northern States but grows less common to the South. It is found in the rather moist localities where the temperature is kept rather low.

Dealated females have been found under rocks during the winter and on the warmer days have been caught running around, according to Davis and Bequaert in their paper on "Ants of Staten Island and Long Island, N. Y." Bull. Brooklyn Ent. Soc., Vol. 17, No. 1, pp. 1-25, 1922.

Locality: Tusculum.

Genus **Formica** Latreille

Formica sanguinea subsp. **rubicunda** Emery

Formica sanguinea subsp. *rubicunda* Emery, Zool. Jahrb. Syst., 7: 647, 1893.

A large number of these ants were observed while they were on a raid for slaves, on the very top of Cold Spring Mountain which has an altitude of over 6,000 ft. This was the only time this ant was taken.

It is reported from Pennsylvania, New Jersey, North Carolina, Massachusetts, Connecticut, Michigan, Illinois, Colorado, Montana and Canada. So it is obvious that this species is a northern form which is able to exist as far south as Tennessee and North Carolina due to the temperature in the mountains approximating that of its range to the north.

The nest of this species is very similar to *subintegra*. An attempt was made to excavate the nest found but the number and size of the rocks beneath the ground surface made it impossible to do so.

For an interesting account of the foray of this species see Wheeler's work "On the Founding of Colonies by Queen Ants, with Special Reference to the Parasitic and Slave Making Species." American Museum of Natural History, Vol. 22, Article 4, pp. 33-105, 1905.

Locality: Cold Spring Mt.

Formica sanguinea subsp. **subintegra** Emery

Formica sanguinea subsp. *subintegra* Emery, Zool. Jahrb. Syst., 7: 648, 1893.

This ant was taken in the eastern and western parts of the state and it will probably be found to occur in most of the regions of Tennessee. In the eastern portion it was taken both in the Smoky Mountains and the Tennessee Valley. The collection in western Tennessee was of stray ants, the nest was not located.

It is listed from Illinois, Pennsylvania, New Jersey, New York, Connecticut, Massachusetts and Maine.

It nests in the ground, generally excavating under rocks or logs and, according to Wheeler, is fond of moving its nests from time to time.

They make raids on the nests of *Formica fusca* and other species and pillage the nest and carry off the pupae, which when grown to maturity act as "slaves" or "auxiliaries."

This is a northern form and Tennessee seems to be the farthest south it has been taken.

For a very interesting account of the slave making habit of the *sanguinea* see "Notice of a Foray of a Colony of *Formica sanguinea* Latr. upon a Colony of a Black Species of *Formica*, for the Purpose of Making Slaves of the Latter," by J. A. Allen, Proc. of the Essex Institute, Vol. 5, No. 1, pp. 1-3, 1866, and W. M. Wheeler's "The Ants

of Casco Bay, Maine, with observations on Two Races of *Formica sanguinea* Latreille." American Museum of Natural History, Vol. 24, Article 33, pp. 619-645, 1908.

Localities: Graystone Mt., Tusculum, Brownsville.

***Formica pallide-fulva* var. *succinea* Wheeler**

Formica pallide-fulva var. *succinea* Wheeler, Bull. Amer. Mus. Nat. Hist., 20: 369, 1904.

This species was taken but twice, once in the Nashville region and the other time at Tiptonville in the Mississippi Embayment. The only nest found was in the ground at the edge of a dense woods. The opening to the nest, which was at least one inch in diameter, was much larger than that of any other form of *pallide-fulva* collected. The opening was surrounded by a crater 2 to 3 inches high. The nest extended beyond 2½ ft. into the ground.

Type locality is Austin, Texas; also reported from Oklahoma.

This is distinctly a southern form with Tennessee, perhaps, about its northern limit. Temperature appears to be the important factor in its distribution.

Localities: Tiptonville, Murfreesboro.

***Formica pallide-fulva* subsp. *schaufussi* Mayr**

Formica schaufussi Mayr, Verh. der. k. k. Zool. bot. Gesell. Wien. 1886, 11-12.

This species was taken several times but only in the Tennessee Valley. It prefers open situations for nesting, and the openings of the nests are surrounded with very little or no material, which differs from most of the *pallide-fulva*. It is very timid and when disturbed runs rapidly away leaving the larva and pupae.

It is listed from Ontario, Maine, New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, North Carolina, Indiana, Illinois, Wisconsin, and Mississippi.

For description of the ant and its habits see "A Revision of the Ants of the Genus *Formica*," Bulletin of the Museum of Comp. Zoology, Vol. 53, No. 10, 1913.

Localities: Knoxville, Graystone Mt., Tusculum.

***Formica pallide-fulva* subsp. *schaufussi* Mayr var. *incerta* Emery**

Formica pallide-fulva schaufussi var. *incerta* Emery, Zool. Jahrb. Syst., 7: 655, 1893.

Of the *pallide-fulva* group taken in Tennessee this variety was by far the most common. It was not taken in the central portion of the state but will probably be found with more intensive collecting. It was not taken on the mountains due, perhaps, to the fact that it prefers open situations for nesting. It is widely distributed in the United States, being listed from Virginia, New Jersey, New York, Pennsylvania, Connecticut, Massachusetts, New Hampshire, Illinois, Wisconsin, Colorado and New Mexico.

In every case it was found nesting in open situations, especially corn and cotton fields. The opening to the nest is generally surrounded by a small crater.

While collecting in the region near Ripley, the writer happened to notice a colony of this ant whose nest had been covered with water due to heavy rains. The queen, and workers bearing the brood in their mandibles, were all clinging to a dead weed which extended above the water about two feet. The opening to the nest with its crater could be plainly seen through the two or three inches of water at the base of the weed.

Localities: Tusculum, Ripley, Tiptonville.

***Formica pallide-fulva* subsp. *nitidiventris* Emery var. *fuscata* Emery.**

Formica pallide-fulva subsp. *fuscata* Emery, Zool. Jahrb. Syst., 7: 656, 1893.

Only one specimen of the ant was collected. It was found running on a tree in an open woods near Murfreesboro.

Type locality: Pennsylvania. Reported also for North Carolina, Georgia, New Jersey, New York, Massachusetts, Illinois, South Dakota, New Mexico and Ontario.

Wheeler says the following about this variety: "This ant nests only in woods, usually in hilly country and is much rarer than any other varieties or subspecies."

Locality: Murfreesboro.

***Formica pallide-fulva schaufussi* var. *dolosa* Wheeler.**

Formica pallide-fulva schaufussi var. *dolosa* Wheeler, Bull. Amer. Mus. Nat. Hist. 20: 370, 1904.

Although this ant was taken several times it is far from common. It was taken only in the Tennessee Valley section, but will no doubt be found to occur throughout the state with the exception of the higher altitudes.

Wheeler says this is a distinctly southern variety of *schaufussi*. He lists it from Texas, Arkansas, Louisiana, Missouri, North Carolina and Georgia.

Its nesting habits are the same as for *incerta*.

Localities: Tusculum, Chuckey, Graystone Mt.

***Formica fusca* Linnaeus var. *subsericea* Say**

Formica subsericea Say, Boston Journ. Nat. Hist., 1: 239, 1836.

Only one specimen of this *Formica* was taken. It is the common black *Formica* in the northern states, and obviously is rare in Tennessee. The specimen was taken at Tiptonville, which is near the Mississippi River. According to Wheeler it is the most abundant insect, next to *Lasius niger* var. *americanus*, in the eastern United States.

For information on its nests and habits see "A Revision of the Ants of the Genus *Formica* Mayr," Bulletin of Museum of Comp. Zoology, Vol. 53, No. 10, 1913.

Locality: Tiptonville.

***Formica fusca* var. *subaenescens* Emery²**

Formica fusca var. *subaenescens* Emery, Zool. Jahrb. Syst., 7: 659, 1893.

Although this seems to be a northern form it was the most common form of *Formica* in east Tennessee. It was especially common on top of the high peaks of the Big Smoky Mountains. It was collected several times in the valley but the nests were always in very shady locations. It was not taken in the central or western portions of the state.

In this case it seems very evident that temperature must be the most important factor in the distribution of this ant. The altitude of the area in which it was found provides a temperature approximating that of its range to the north.

It is reported from Illinois, Maine, New Hampshire, Massachusetts, Connecticut, New York, Montana, Utah, South Dakota, Colorado and Canada.

It was found nesting in the ground under rocks in all but two cases. On top of Laurel Bald Mountain one nest was found in a log, and one in a stump.

Localities: Tusculum, Graystone Mt., Laurel Bald Mt.

Genus ***Camponotus*** Mayr***Camponotus castaneus* Latreille**

Camponotus castaneus Latreille, Hist. Nat. Fourm., p. 110, 11, 12 A. C. and D., 1802.

Only two specimens of this large beautiful ant were taken. One was brought to the writer by a resident of Greeneville, who said the colony was nesting in the sill of a porch. The other was picked up on a path on the campus of Tusculum College. It is listed from New Jersey, Illinois, New York, Connecticut, Florida, North Carolina and Ohio.

Wheeler says it nests in the ground under stones and logs in rather small colonies.

Localities: Greeneville, Tusculum.

***Camponotus castaneus* subsp. *americanus* Mayr**

Camponotus americanus Mayr, Verh. Zool. bot. Ges. Wien, 12: 661, 1862.

This subspecies of *Camponotus* was taken in all three sections of Tennessee, but was not taken on the mountains. In some sections it is very common, while in others it seems to be entirely absent. Especially in East Tennessee, in woods where drainage was good and where rocks were scattered about, there were many colonies. They seem to prefer clay soil, but will nest in other types. Dr. C. H. Kennedy took this ant as common in the west slope of the Chilhowie Range at an elevation of 1,000 ft. above the valley. Found under flat stones on moderately moist slopes.

²C. H. Kennedy's collections made at Indian Gap (5,000 ft.), Blount Co., have been named *lecontei*. See *Annals Ent. Soc. Amer.* 30 (3): 542-544, 1937.

It has a very wide distribution, being reported from Florida, South Carolina, North Carolina, New York, New Jersey, Connecticut, Ohio, Illinois and Mississippi. W. H. Wheeler says they range as far north as Massachusetts.

It usually builds its nests in the ground under a stone or rock. Dr. Mary Talbot in her paper on "Distribution of Ant Species in the Chicago Region," gives their nesting sites as logs and ground.

There seems to be no good reason for absence of this ant in the high mountains unless it can be attributed to too much moisture. The winter temperature is certainly not more severe than Massachusetts nor the summer temperature greater than Florida. The subsoil on the mountains is clay and it nests freely in clay in the valley. The rainfall and moisture, however, is greater on the mountains and perhaps this is the factor which limits their distribution to the lower altitude.

Localities: Tusculum, Knoxville, Brownsville, Nashville.

***Camponotus herculeanus* L. subsp. *pennsylvanicus* DeGeer**

Formica pennsylvanica DeGeer, Mem. Serv. Hist. Insects., 3: 391, 1773.

The "Carpenter Ant" is found in all regions of Tennessee, from the highest mountains to the lowlands of the Mississippi. In some regions it is the most common ant encountered. It probably occurs in the whole area of the United States east of the Rockies. It is reported from Texas, Florida, North and South Carolina, Mississippi, Ohio, Illinois, New York, New Jersey and Connecticut. It seems to be adapted to a great variety of environmental factors.

It generally nests in logs or stumps in shady places, but often nests in standing trees that may be partially decayed. It is sometimes taken in logs that are in the open, thus it seems to be able to stand a great range of temperature. In a paper, "Notes on the Architecture and Habits of *Formica pennsylvanica*, The Pennsylvania Carpenter Ant," Rev. Henry C. McCook, Transactions of American Entomological Society, Vol. 5, there is an excellent description of nesting habits and views of the galleries. And in a paper also by Rev. H. C. McCook, "On the Vital Powers of Ants," in Proceedings American Entomology Society, December, 1876, is an account of his experiment in which he subjected the workers of *C. herculeanus pennsylvanicus* to extremes of temperature, both high and low, with no apparent harm to the ants.

Localities: Greeneville, Knoxville, Tusculum, Cold Spring Mt., Brownsville, Laurel Bald Mt., Nashville, Slabtown.

***Camponotus herculeanus* L. subsp. *pennsylvanicus* var. *ferrugineus* Fabr.**

Formica ferruginea Fabricius, Suppl. Entom. Syst., 279, 1798.

This variety of *Camponotus* was taken only in the Tennessee Valley. It has been reported from Mississippi, New Jersey and Illinois. Wheeler states in regard to this variety, "It is apparently confined to the states east of the Mississippi River. Its habits are very similar to those of *pennsylvanicus*, but it seems to be much less abundant."

It was found nesting with one exception in logs or dead trees still standing. The exception was a nest under a rock and in digging for the runways it was found that they followed the roots of a maple tree, and in several places the root had been cut into for brood pockets.

If more intensive collecting is done in the other regions of the state, this variety will undoubtedly be found.

Localities: Greeneville, Chuckey, Cold Spring Mt., Tusculum.

***Camponotus caryae* Nyl. *caryae* Fitch.**

Camponotus caryae (Fitch), Trans. N. Y. State Agri. Soc., 14: 855-859, 1855.

Only one nest of this ant was taken. However, stray workers were caught running several times in dense woods. It was not taken anywhere except in east Tennessee. The nest was in a partially dead oak tree near the top of Laurel Bald Mountain which has an altitude of better than 6,000 ft. The strays were taken in very dense oak-chestnut woods in the valley near Tusculum.

This ant is not often listed in the literature, but it has been reported from South Carolina, New York, Ohio, New Jersey and Connecticut.

Localities: Tusculum, Laurel Bald Mt.

***Camponotus caryae* var. *decipiens* Emery**

Camponotus marginatus var. *decipiens* Emery, Zool. Jahrb. Abth. f. Syst., 7: 676, 1893.

Throughout the state this seemed to be the most common of the *caryae* group. Only one nest was ever found but it was collected in the eastern, central and western portions running on the ground or on vegetation. One nest was located in the porch of the writer's home but was not cut into.

It is reported from Indiana, Kansas, Colorado, Utah, South Carolina and Mississippi.

Since these ants usually build in galls of trees or in partially dead trees, environmental factors such as moisture, temperature, etc., are probably not as important as in the case of those which build their nests in the ground. Since they attend plant lice and also eat the secretions of oak trees, these factors are probably more important in their distribution.

The nest in the porch at Tusculum was in solid, cured wood, shown by material that the ants were carrying out during their excavation.

Localities: Tusculum, Brownsville, Murfreesboro.

***Camponotus caryae* subsp. *rasilis* Wheeler.**

Camponotus caryae subsp. *rasilis* Wheeler, Jour. N. Y. Ent. Soc., 18: 227, 1910.

Only one specimen of this *Camponotus* was taken. It was found running on a log in a rather dense oak-chestnut wood. The nest was not located.

It is reported from Florida, Texas and Mississippi. M. R. Smith in his "List of the Ants of Mississippi," gives the following regarding its habits: "Nests are made in galls or in twigs of trees. Occasionally

the workers invade houses, showing a decided fondness for sweets, such as syrup, jams, sugar, etc."

Tennessee appears to be close to its northern limit of distribution and temperature is evidently the most important factor in its distribution.

Locality: Graystone Mt.

***Camponotus caryae* subsp. *rasilis* var. *pavidus* Wheeler**

Camponotus caryae subsp. *rasilis* var. *pavidus* Wheeler, Jour. N. Y. Ent. Soc., 18: 228-229, 1910.

The Mississippi Embayment was the only region where this *Camponotus* was taken.

This variety has been reported from Florida and Mississippi and it is without much doubt a southern form and Tennessee or Kentucky is probably about the northern limit of its distribution. There is the possibility, however, that it will be found much farther up the Mississippi than these states.

It was found nesting in oak stumps. The workers are very cowardly and flee from the nest when it is disturbed.

Localities: Ripley, Brownsville.

***Camponotus (Colobopsis) mississippiensis* Smith**

Camponotus (C) mississippiensis Smith, Psyche, 30: 83-86, 1923.

A single specimen of this ant was taken near Murfreesboro in June, 1935. It was running on the leaves of weeds bordering Stone River.

M. R. Smith says it is the most common species in the region of State College, Miss., and that it is found nesting in the twigs of white ash and in red oak galls.

The worker has been seen to feed on honey dew. It is a southern form and the writer believes that Murfreesboro marks the farthest point north it has been reported.

Since it is known to feed on honey dew, its distribution may be determined by the presence of the insect it attends. But temperature also certainly seems to be a factor.

For description of habits of *Colobopsis* see "The American Ants of the Subgenus *Colobopsis*," by Wheeler. American Museum of Natural History, Vol. 20, Art. 10, pp. 139-158, 1904.

Locality: Murfreesboro.

ANT DISTRIBUTION IN TENNESSEE

| | No of Collections | 300-2,000 ft. | 2,000-5,000 ft. | Above 5,000 ft. | In Weed and Grass Stems | In Logs, Stumps | In dead wood of Standing Trees | With Crater | With Mound | Under Stones | In Ground | Oak-Hickory | Hemlock-White Pine | Oak-Pine | Oak-Chestnut | Tulip-Hemlock | Spruce | Lower Grass Land | High Grassy-Balds | Cedar Glades | Stray Ants only | Nest Taken |
|---|-------------------|---------------|-----------------|-----------------|-------------------------|-----------------|--------------------------------|-------------|------------|--------------|-----------|-------------|--------------------|----------|--------------|---------------|--------|------------------|-------------------|--------------|-----------------|------------|
| <i>Stigmatomma pullipes</i> | 4 | * | * | * | | | | | | * | * | | | | * | | | | | | | * |
| <i>Symphicta pergandei</i> | 1 | * | * | | | | | | | * | * | | | | | | | | | | * | |
| <i>Proceratium silaceum</i> | 4 | * | * | | | * | | | | * | * | | | | * | | | | | | | * |
| <i>Euponera gilva</i> | 2 | * | * | | | * | | | | * | * | | | | * | | | | | | | * |
| <i>Ponera coarctata pennsylvanica</i> | 11 | * | * | * | | * | | | | * | * | | | | * | | | | | * | | * |
| <i>Ponera trigona opacior</i> | 7 | * | * | | | * | | | | * | * | | | | * | | | | | * | | * |
| <i>Eciton schmitti</i> | 1 | * | * | | | * | | | | * | * | | | | * | | | | | | * | |
| <i>Eciton carolinensis</i> | 3 | * | * | * | | * | | | | * | * | | | | * | | | | | | * | |
| <i>Myrmecina graminicola americana</i> | 7 | * | * | * | | * | | | | * | * | | | | * | | | | | | * | |
| <i>Monomorium pharaonis</i> | 1 | Ripley | -In | Ho tel. | | | | | | * | * | | | | * | | | | | | * | |
| <i>Monomorium minimum</i> | 9 | * | * | * | | * | | | | * | * | | | | * | | | | | | * | |
| <i>Solenopsis molesta</i> | 17 | * | * | * | | * | | | | * | * | | | | * | | | | | | * | |
| <i>Pheidole morrisi</i> | 3 | * | * | | | * | | | | * | * | | | | * | | | | | | * | |
| <i>Pheidole dentata commutata</i> | 14 | * | * | | | * | | | * | * | * | | | | * | | | | | | * | |
| <i>Pheidole crassicornis</i> | 5 | * | * | | | * | | | | * | * | | | | * | | | | | | * | |
| <i>Pheidole tysoni</i> | 1 | * | * | | | * | | | | * | * | | | | * | | | | | | * | |
| <i>Pheidole vinelandica</i> | 11 | * | * | * | | * | | | | * | * | | | | * | | | | | | * | |
| <i>Crematogaster lineolata</i> | 11 | * | * | * | | * | | | | * | * | | | | * | | | | | | * | |
| <i>Crematogaster lineolata cerasi</i> | 1 | * | * | | | * | | | | * | * | | | | * | | | | | | * | |
| <i>Crematogaster lenitascula</i> | 4 | * | * | | | * | | | | * | * | | | | * | | | | | | * | |
| <i>Crematogaster lenitascula clara</i> | 1 | * | * | | | * | | | | * | * | | | | * | | | | | | * | |
| <i>Crematogaster opaca depilis punctulata</i> | 1 | * | * | | | * | | | | * | * | | | | * | | | | | | * | |
| <i>Crematogaster nictima missouriensis</i> | 4 | * | * | | | * | | | * | * | * | | | | * | | | | | | * | |
| <i>Stenamma brevicorne impressum</i> | 2 | * | * | | | * | | | | * | * | | | | * | | | | | | * | |
| <i>Aphenogaster treatae</i> | 5 | * | * | * | | * | | | | * | * | | | | * | | | | | | * | |
| <i>Aphenogaster lamellidens nigripes</i> | 13 | * | * | | | * | | * | | * | * | | | | * | | | | | | * | |

ANT DISTRIBUTION IN TENNESSEE—(Continued)

| | No of Collections | 300-2,000 ft. | 2,000-5,000 ft. | Above 5,000 ft. | In Weed and Grass Stems | In Logs, Stumps | In dead wood of Standing Trees | With Crater | With Mound | Under Stones | In Ground | Oak-Hickory | Hemlock- White Pine | Oak-Pine | Oak-Chestnut | Tulip-Hemlock | Spruce | Lower Grass Land | High Grassy- Bald | Cedar Glades | Stray Ants only | Nest Taken |
|--|----------------------|---------------|-----------------|-----------------|----------------------------|--------------------|-----------------------------------|-------------|------------|--------------|-----------|-------------|------------------------|----------|--------------|---------------|--------|---------------------|-------------------------|--------------|-----------------|------------|
| <i>Aphenogaster fulva</i> | 6 | * | * | * | * | * | | | | * | * | * | * | * | * | * | * | * | * | | | * |
| <i>Aphenogaster fulva aquia</i> | 19 | * | * | * | * | * | | | | * | * | * | * | * | * | * | * | * | * | | | * |
| <i>Aphenogaster fulva aquia picea</i> | 6 | * | * | * | * | * | | | | * | * | * | * | * | * | * | * | * | * | | | * |
| <i>Aphenogaster fulva aquia rudis</i> | 1 | * | | | * | * | | | | * | * | * | * | * | * | * | * | * | * | | | * |
| <i>Aphenogaster texana carolinensis</i> | 3 | * | | | * | * | | | | * | * | * | * | * | * | * | * | * | * | | | * |
| <i>Aphenogaster tennesseensis</i> | 6 | * | * | * | * | * | | | | * | * | * | * | * | * | * | * | * | * | | | * |
| <i>Myrmica punctiventris pinetorum</i> | 2 | * | | | * | * | | | | * | * | * | * | * | * | * | * | * | * | | | * |
| <i>Myrmica rubra brevicornis</i> | 1 | * | | | * | * | | | | * | * | * | * | * | * | * | * | * | * | | | * |
| <i>Myrmica rubra scabrimodis fracticornis</i> | 2 | * | | | * | * | | | | * | * | * | * | * | * | * | * | * | * | | | * |
| <i>Myrmica rubra scabrimodis sabuleti</i> | 2 | * | | | * | * | | | | * | * | * | * | * | * | * | * | * | * | | | * |
| <i>Myrmica rubra scabrimodis pinosus</i> | 5 | * | * | * | * | * | * | | | * | * | * | * | * | * | * | * | * | * | | | * |
| <i>Leptothorax longispinosus</i> | 10 | * | * | * | * | * | * | | | * | * | * | * | * | * | * | * | * | * | | | * |
| <i>Leptothorax curvispinosus</i> | 2 | * | | | * | * | | | | * | * | * | * | * | * | * | * | * | * | | | * |
| <i>Leptothorax (D) pergandei</i> | 9 | * | | | * | * | | | | * | * | * | * | * | * | * | * | * | * | | | * |
| <i>Leptothorax (D) pergandei floridanus</i> | 2 | * | | | * | * | | | | * | * | * | * | * | * | * | * | * | * | | | * |
| <i>Strumigenys creightoni</i> | 3 | * | | | * | * | | | | * | * | * | * | * | * | * | * | * | * | | | * |
| <i>Strumigenys pulchella</i> | 1 | * | | | * | * | | | | * | * | * | * | * | * | * | * | * | * | | | * |
| <i>Strumigenys clypeata</i> | 1 | * | | | * | * | | | | * | * | * | * | * | * | * | * | * | * | | | * |
| <i>Strumigenys louisianae laticephala</i> | 1 | * | | | * | * | | | | * | * | * | * | * | * | * | * | * | * | | | * |
| <i>Strumigenys dietrichi</i> | 4 | * | | | * | * | | | | * | * | * | * | * | * | * | * | * | * | | | * |
| <i>Strumigenys rostrata</i> | 3 | * | | | * | * | | | | * | * | * | * | * | * | * | * | * | * | | | * |
| <i>Trachymyrmex septentrionalis obscurior seminole</i> | 3 | * | | | * | * | * | | | * | * | * | * | * | * | * | * | * | * | | | * |
| <i>Dolichoderus taschenbergi</i> | 1 | * | | | * | * | | | | * | * | * | * | * | * | * | * | * | * | | | * |
| <i>Dorymyrmex pyramicus</i> | 2 | * | * | | * | * | | | | * | * | * | * | * | * | * | * | * | * | | | * |
| <i>Dorymyrmex pyramicus flavus</i> | 3 | * | * | | * | * | | | | * | * | * | * | * | * | * | * | * | * | | | * |
| <i>Tapinoma sessile</i> | 5 | * | * | * | * | * | * | | | * | * | * | * | * | * | * | * | * | * | | | * |
| <i>Iridomyrmex pruinosus analis</i> | 9 | * | * | * | * | * | * | | | * | * | * | * | * | * | * | * | * | * | | | * |

ANT DISTRIBUTION IN TENNESSEE—(Continued)

| | No of Collections | 300-2,000 ft. | 2,000-5,000 ft. | Above 5,000 ft. | In Weed and Grass Stems | In Logs, Stumps | In dead wood of Standing Trees | With Crater | With Mound | Under Stones | In Ground | Oak-Hickory | Hemlock-White Pine | Oak-Pine | Oak-Chestnut | Tulip-Hemlock | Spruce | Lower Grass | High Grassy-Balds | Cedar Glades | Stray Ants only | Nest Taken |
|--|-------------------|---------------|-----------------|-----------------|-------------------------|-----------------|--------------------------------|-------------|------------|--------------|-----------|-------------|--------------------|----------|--------------|---------------|--------|-------------|-------------------|--------------|-----------------|------------|
| <i>Brachymyrmex heeri depilis</i> | 7 | | * | | | * | | | | * | * | | * | * | * | * | | | | | * | * |
| <i>Prenolepis im paris</i> | 10 | * | * | | | | | | | * | * | | * | * | * | * | | | | * | | * |
| <i>Prenolepis (N) parvula</i> | 17 | * | * | | | * | | * | | * | * | | * | * | * | * | | | | | | * |
| <i>Lasius niger neoniger</i> | 2 | * | | | | | | * | | * | * | | | * | * | * | | | | | | * |
| <i>Lasius niger americana</i> | 6 | * | * | | | * | | * | | * | * | | * | * | * | * | | | | | | * |
| <i>Lasius umbratus mixtus a phidicola</i> | 4 | * | * | | | * | | * | | * | * | | * | * | * | * | | | | | | * |
| <i>Lasius interjectus</i> | 6 | * | * | | | | | * | | * | * | | * | * | * | * | | | | | | * |
| <i>Lasius claviger</i> | 3 | * | | | | | | | | * | * | | * | * | * | * | | | | | | * |
| <i>Formica sanguinea rubicunda</i> | 1 | | | * | | | | | | * | * | | * | * | * | * | | | | | * | * |
| <i>Formica sanguinea subintegra</i> | 3 | * | | | | | | | | * | * | | * | * | * | * | | | | | * | * |
| <i>Formica pallide-fulva succinea</i> | 2 | * | | | | | | | | * | * | | * | * | * | * | | | | | * | * |
| <i>Formica pallide-fulva schaufussi</i> | 4 | * | | | | | | * | | * | * | | * | * | * | * | | | | | * | * |
| <i>Formica pallide-fulva incerta</i> | 6 | * | | | | | | * | | * | * | | * | * | * | * | | | | | * | * |
| <i>Formica pallide-fulva nitidiventris fuscata</i> | 1 | * | | | | | | * | | * | * | | * | * | * | * | | | | | * | * |
| <i>Formica pallide-fulva schaufussi dolosa</i> | 4 | * | | | | | | * | | * | * | | * | * | * | * | | | | | * | * |
| <i>Formica fusca subsericea</i> | 1 | * | | | | | | | | * | * | | * | * | * | * | | | | | * | * |
| <i>Formica fusca subaenescens</i> | 9 | * | | | | * | | | | * | * | | * | * | * | * | | | | | * | * |
| <i>Camponotus castaneus</i> | 2 | * | | | | | | | | * | * | | * | * | * | * | | | | | * | * |
| <i>Camponotus castaneus americanus</i> | 7 | * | | | | | | | | * | * | | * | * | * | * | | | | | * | * |
| <i>Camponotus herculeanus pennsylvanicus</i> | 12 | * | | | | * | | * | | * | * | | * | * | * | * | | | | | * | * |
| <i>Camponotus herculeanus pennsylvanicus ferrugineus</i> | 5 | * | | | | * | | * | | * | * | | * | * | * | * | | | | | * | * |
| <i>Camponotus caryae</i> | 2 | * | | | | | | * | | * | * | | * | * | * | * | | | | | * | * |
| <i>Camponotus caryae decipiens</i> | 6 | * | | | | | | * | | * | * | | * | * | * | * | | | | | * | * |
| <i>Camponotus caryae rasilis</i> | 1 | * | | | | | | | | * | * | | * | * | * | * | | | | | * | * |
| <i>Camponotus caryae rasilis pacidus</i> | 3 | * | | | | * | | | | * | * | | * | * | * | * | | | | | * | * |
| <i>Camponotus (C) mississippiensis</i> | 1 | * | | | | | | | | * | * | | * | * | * | * | | | | | * | * |

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