# A survey of the Ants (Hymenoptera: Formicidae) of the Tombigbee National Forest, Tombigbee Unit, Mississippi

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## Abstract

A survey of Formicidae was conducted in the Ackerman Unit of the Tombigbee National Forest, in Winston and Choctaw Counties, Mississippi. Collections were made with pitfall traps from 15 March 1999 to 6 March 2000 and other collecting methods on various dates from the spring of 2002 through the fall of 2003. A total of 27 genera and 71 species representing 7 subfamilies were collected in this study. Twelve new state records and several rarely collected species are reported as a result of this survey. Habitat and microhabitat information within the National Forest is given for each species.

## Introduction

Ants are among the most numerous of creatures on the planet and, consequently, they greatly impact the lives of man. They directly affect us by invading houses, biting and stinging people, raiding food supplies, damaging structures, and killing animals. However, ants are important organisms in ecosystems and provide many beneficial contributions. Ants move and aerate large quantities of soil, disperse the seeds of herbaceous plant species (Hölldolber and Wilson, 1990), bring nutrients to the soil, kill large quantities of other insects (including pest species), aid in the natural decay process of both dead plants and animals, and perform numerous other activities. Ants can be found in all terrestrial habitats, including deserts, tundras, forests, swamps, fields, and urban areas. Their diets are quite varied with different species eating such things as seeds, nectar, honeydew (secreted by other insects), fungi, and insects and other animals (Bolton, 1994). Ants greatly vary morphologically and range in size from less than 1 millimeter to about 40 millimeters.

Despite the high numbers and great importance of ants, they surprisingly remain a very troublesome group to classify and identify. The family Formicidae has been a taxonomic conundrum, or has had much taxonomic confusion, and only became somewhat clarified in 1950 W. S. Creighton's monograph, "Ants of North America." Taxonomic clarification of Formicidae appears proising as there are many workers currently working with Formicidae in one aspect or another. Current research will undoubtedly help us better understand our Mississippi ant fauna.

Marion Smith studied ants extensively in Mississippi from the early 1920's until the mid 1930's and he made great contributions to our knowledge of the state's fauna by finding many new state records and describing several new species (1924 a, b, c, 1927,

1928 a, b, 1931a, 1932). Since that time many taxonomic changes have taken place, thus making his "Ants of Mississippi" basically unusable. Compounding that problem is the need to incorporate recently described and newly introduced exotic species to his list of ants of Mississippi. Intensive collecting and study will clear up some of the more difficult taxonomic questions, and that makes faunistic studies of ants of utmost importance. Perhaps the biggest problems arise from the fact that ants are quite variable, have different castes, and seem to often interbreed. Other problems can be traced to a lack of collecting in certain habitats. Without enough specimens for examination, it becomes a Sisyphean labor to understand the variation and differences between and among species.

The Ackerman Unit of the Tombigbee National Forest covers an area of 39,467 acres and lies in the adjacent counties of Choctaw, Winston, and Oktibbeha in east central Mississippi. The majority of the Ackerman Unit is found in the North Central Plateau Physiographic Region of the state with only a few acres found in the Flatwoods Region (McDaniel, 1992). The topography of the Ackerman unit varies from the nearly flat floodplains of the Noxubee River and its tributaries to very dissected hills with steep ravines. The elevations range from 641 feet to near 300 feet. Drainage is quite variable ranging from well-drained slopes to low lying areas that are inundated seasonally. Springs and seeps can be found sporadically throughout this region. The soils are typically acid to neutral and are mostly clays, sandy clays, or occasionally gravelly clays. Basically, this forest is a mix of deciduous trees and pines with a few open cutover areas or powerline cuts. Upland areas include a variety of oaks (white, post, southern red, black), hickories, loblolly pine and some shortleaf pines. The pines are more predominant on the dry sandier ridges with some hickories and oaks (such as blackjack) present as well. The trees typically seen on slopes and bases of ravines and near small streams were a variety of oaks, hickories, cucumber magnolia, tulip poplar, beech, and sweetgum.

The Ackerman Unit of the Tombigbee National Forest is rich in plant diversity and includes many different habitats. In fact, a floristic survey documented 14 sensitive species (McDaniel, 1992). Because of the number of unusual and rare plant species present, it was expected that the insect fauna also would include rare or undescribed species. For these reasons the Mississippi Entomological Museum (MEM) conducted a survey of ants and other selected insects in the Tombigbee National Forest. Ants were chosen as a study group because of the various ecological roles they play, their relative abundance, and their tendency to live in a given habitat, making them relatively easy to find. In an effort to collect as many foraging ants as possible, a pitfall study was conducted in three of the more unique localities. In addition to pitfall sampling, other collecting methods included sifting leaf litter, Berlese litter samples, beating of vegetation, tearing apart rotting wood, baiting, and general collecting. These other collecting methods were used to catch ants living in different habitats within the Tombigbee National Forest including ants less likely to be collected in pitfall traps.

## Methods

**Survey sites**. Collections were made in 21 sites in Tombigbee National Forest in Winston and Choctaw Counties from 15 March 1999 through the fall of 2003. Three sites in Winston County (sites 1-3) were used as primary collecting sites. In addition to the

three primary sites, collections were made at 18 additional sites. Several sites were chosen based on the floristic study of McDaniel (1992), while other sites were selected based on field visits (collection date are provided in Appendix 1

Site 1 (33°10'20"N 89°03'55"W) in Winston County is located on the south side of Highway 25 west of the Winston and Choctaw Counties Correctional Facility. This site was perhaps the most interesting botanically and, unfortunately, much of it was lost due to subsequent four-laning of highway 25. This area consisted of an old-growth forest on steep slopes with bigleaf magnolia, cucumber tree, Florida maple, and basswood, with a rich herbaceous understory. This site was rated as a "1" (highest rating possible being a 1+ and indicating the most unique of sites coupled with sensitive plant species) by McDaniel (1992) who referred to it as site 25. *Swertia caroliniensis* and *Osmorhiza longistylis* were two of the more interesting plants found here.

Site 2 (33°11'50"N 89°03'20"W) in Winston County, is an old growth hardwood ravine found on Poplar Flat Road at Road 953A. This site was also given a ranking of "1" by McDaniel (1992) who listed it as site 14. *Cypripedium pubescens* and *Schisandra glabra* were two special plants found here.

Site 3 (33°13'01"N 89°05'42"W) in Winston County is a hardwood ravine located near Little Rock Cemetery off Pigeon Roost Road (road 971-1). Site 3 was rated a "1+" (as site 11) by McDaniel (1992). This area has steep sloped ravines with a broad floor and a prominent creek running through it. The forest here is an oak-hickory-beech-tulip poplar mix with a rich herbaceous flora. Special plants found here are *Cypripedium pubescens, Lilium superbum*, and *Panax quinquefolius*.

Site 4 (at 33°15'18"N 89°05'29"W) in Winston County is a spring seep with sweet bay and many ferns present and is located near the intersection of Roads 955 and 955A. This is a low-lying seepage area in a mostly pine dominated woodland, but also having some deciduous trees present. This site was rated by McDaniel (as site 8) as a 2.5

Site 5 (33°12'53"N 89°06'10"W) in Winston County is a hardwood ravine, which leads to Tanksley Cemetery and found near the intersections of Sheep Ranch Road (road 956) and Pigeon Roost Road (road 971-1). McDaniel (1992) rated this site (his site 10) a "1". Site 5 has a canopy of oak-hickory-beech-tulip poplar with some cucumber tree, sweetgum, basswood, and oak-leaf hydrangea present. The ridges are somewhat sandy with a mix of pines and hardwoods. Special plants found here were *Cypripedium pubescens* and *Panax quinquefolius*.

Site 6 (33°14'19"N 89°05'58"W) in Winston County is found at Rock Crusher Road (road 956-C) off Pigeon Roost Road (road 971-1). This area is an old dirt road now closed to vehicular travel that extends through an area of cutover pines and into a richer mixed mesic forest.

Site 7 (33°15'15"N89°06'21"W) in Winston County is a power-line cut on Webster Road (road 955). This site is basically a rolling swathe of field that cuts through the National Forest.

Site 8 (33°12'30"N 89°04'32"W) in Winston County is located at and near the Noxubee Hill Cemetery on Sheep Ranch Road (road 956). This site is in a somewhat flat, high, and dry area with a mix of hardwoods and pines. A trail beginning at the old cemetery extends through the adjoining mixed forest.

Site 9 (33°12'20"N 89°04'18"W) in Winston County is located on Sheep Ranch Road (road 956). This site is on the sides of a road through a mixed forest that had received serious damage from a severe storm several months prior to collecting there.

Site 10 (33°13'03"N 89°06'35"W) in Winston County is part of a bike trail on Sheep Ranch Road (road 956) past Pigeon Roost Road (road 971-1). Collections were made on a ridge with mixed pines and hardwoods.

Site 11 (33°15'11"N 89°05'38"W) in Winston County is at a small creek near the intersection of Pigeon Roost Road (road 971-1) and Webster Road (road 955) in Winston County. Collections were made at a small sand bar beside a small creek.

Site 12 (33°16'23"N89°08'38"W) in Choctaw County is located near the swimming area of Choctaw Lake.

Site 13 (33°13'42"N 89°07'58"W) in Choctaw County is located off of Sheep Ranch Road (road 956). This site was a mixed mesic forest with steep ravines. Maples, oaks, hickory, and pines dominated this area with several ferns and mosses being present in low areas.

Site 14 (33°13'29"N 89°07'22"W) in Choctaw County is located off of Sheep Ranch Road (road 956). This site is mostly a pine forest with both *Pinus taeda* and *P. echinata* present. Collections were made primarily on a trail on the ridge and just off the trail on the ravine slopes.

Site 15 (33°12'55"N 89°06'24"W) in Winston County is a powerline cut located on Sheep Ranch Road (road 956). This site is an open area underneath power lines with reddish clay and sandy soil.

Site 16 (33°12'43"N 89°06'12"W) in Winston County is on Sheep Ranch Road (road 956). Collections were made along an old gated road that runs on the top of a ridge in an area with mostly pine trees, but with some hardwoods present.

Site 17 (33°13'47"N 89°08'07"W) in Choctaw County is a mixed mesic site found just off of Sheep Ranch Road (road 956).

Site 18 (33°13'34"N 89°08'36"W) in Choctaw County is located at and near Turner Cemetery at the intersection of Sheep Ranch Road (road 956) and road 956-A. This site is located on a somewhat dry sandy ridge with collections made in the sandy soil surrounding the fenced in cemetery.

Site 19 (33°13'03"N89°06'36W) in Choctaw County is at an old clear-cut area off of Sheep Ranch Road (road 956).

Site 20 (33°16'05"N89°06'01"W) in Winston County is a sweet bay bog located off Road 965. McDaniel (1992) gave this site (his site 6) a "1" rating. He considered this site as unique and described this habitat as old-growth hardwood ravine with *Sphagnum*, poison sumac, black haw, and *Chelone glabra*.

Site 21 (33°10'31"N89°02'38"W) in Winston County is a hardwood ravine with mixed forest on ridges located north of Highway 25, but unfortunately, this site was later destroyed by highway expansion work. McDaniel (1992) gave this site (his site 25) a rating of "1". Some special plants present here were *Sanguinaria, Adiantum pedatum*, and *Swertia caroliniensis* (Columbo).

**Sampling methods**. Pitfall traps were run in each of the three primary localities in the Tombigbee National Forest in Winston County (sites 1-3) from 15 March 1999 through 6 March 2000. Five pitfall traps were placed randomly, though, in the vicinity of

one another, at each of the three sites. The contents of all five pitfall traps were combined at each site to make one sample, with a total of 149 samples from all three sites combined. The pitfall traps consisted of plastic deli cups sunk in the ground so that the tops were flush with the ground. The deli cups had an inner diameter of 11 cm at the top, an inner diameter of ca. 8.8 cm at the bottom, and a depth of ca. 7.8 cm. Holes were dug for the pitfall traps using a golf course hole digger, which minimized impact to the surrounding area. Two cups were placed, one inside the other, in the expectation that rain water would fill the bottom cup and float the top cup upwards, thus, preserving the "catch." The cups were filled approximately halfway with a 50/50 mixture of propylene glycol and 70% ethanol, with a pinch of dentonium benzoate added to deter mammals from drinking the solution. Three steel guide vanes measuring 7.2 cm by 30.6 cm were placing equilaterally around the cups and sunk in the ground approximately 2.0 cm. A hexagonal steel metal cover was placed over the top of the cups to divert rain. Pitfall traps were checked weekly starting on 22 March 1999 and ending on 6 March 2000, with one exception when they were checked after a two-week period from 7 June to 21 June.

Additional collections were made at 18 other sites in the National Forest on 19 days during the years 1999-2003. Soil and leaf litter were collected, placed into a white pan, and searched through for ants. Ants collected in this manner were then put into vials of 70% ethyl alcohol. Other litter samples were collected, sifted, placed in one-gallon plastic bags, and taken back to the laboratory for extraction of ants in Berlese funnels. Rotting wood was torn apart and searched for ants. Arboreal species were collected by beating trees and shrubs with a collection sheet underneath. Hollow stems of grasses and other herbaceous plants were broken apart for detecting ant colonies. Various baits, including cookies (Keebler Sandies, Pecan Shortbread), tunafish (StarKist chunk light in water), and hotdogs (Bar S, chicken, beef, & pork), were used to attract ants. The searching for nests in the ground, visual inspection of plants, and general collecting yielded other species. A small percentage of alate ants (sexual forms having wings), were collected at sheets with blacklights. Some ant collections were collected with malaise traps, which were run at sites 1, 2, and 3 during the same period of time the pitfall traps were run.

**Processing and data analysis.** Pitfall samples from each location were combined giving us one sample per week per site with the exception of the samples from the two-week period from 7-21 June 1999. All ants were extracted from pitfall samples, placed in vials of 70% ethyl alcohol, labeled, and given sample numbers. All ants were then identified and counted. Voucher specimens of all species were pinned and labeled, and the remainder of specimens were stored in 70% ethyl alcohol. . All specimens from this study are stored in the Mississippi Entomological Museum.

Ants collected during the course of this study were identified by Joe MacGown, with identities of some species confirmed by James Trager, Mark Deyrup, Mark DuBois, and Gary Umphrey. Species were identified to the genus with Bolton (1994) and to species with a large number of publications (see list of publications used for identification following references).

**Results.** The pitfall traps proved to be an effective way to sample the forest floor and those samples yielded a total of 6440 specimens from the three localities combined. There were a total of 18 genera and 38 species present in the pitfalls representing three

subfamilies (see Appendix 3). The percentage of each species present among the total number of specimens collected was as follows: *Prenolepis imparis*, 31.43 %; *Camponotus chromaiodes*, 13.99 %; *C. americanus*, 8.91 %; *C.* pennsylvanicus, 8.20 %; *Aphaenogaster carolinensis*, 6.23 %; *Pheidole dentata*, 5.76 %; *Solenopsis molesta*, 5.57 %; *Aphaenogaster fulva*, 3.59 %; *Camponotus castaneus*, 3.52 %; *Paratrechina faisonensis*, 3.21 %; *Camponotus subbarbatus*, 1.97 %; *Pheidole tysoni*, 1.50 %; *P. dentigula*, 1.41 %; with the remaining 25 species comprising the final 4.70 % (Appendix 4). These basic species compositions varied somewhat from site to site from the total of all sites combined, but this is probably not significant because placement of individual pitfall traps could have biased overall numbers. Although there was considerable overlap in the species from site to site in the pitfall traps, several species were found at only one site. However, when conducting later collections, most of those species were found at all sites.

An additional 9 genera and 33 species were collected by other means bringing the total to 27 genera and 71 species representing 7 subfamilies: Pseudomyrmecinae, Proceratiinae, Amblyoponinae, Ponerinae, Myrmicinae, Dolichoderinae, and Formicinae (a list of species is given in Appendix 1). Although 38 species were collected in pitfall traps, only one of those species was not collected by other means, *Temnothorax schaumi* Roger (2 workers). So, despite the number of ants collected in the pitfalls, the overall results of this survey would not have differed significantly without their use.

A total of 2019 pinned specimens and 758 vial collections from this study are stored in the MEM collection. Specimens from vials were not counted, except for those collected from pitfall traps. Many vial samples represent colonies found with large numbers of representatives per vial. No attempt was made to collect every ant seen in the Tombigbee Forest, with only representatives of common ant species made.

This survey of ants in the Tombigbee National Forest has resulted in twelve new state records for Mississippi that will be reported in the future including: *Discothyrea testacea* Roger (a new genus and species for Mississippi), *Ponera exotica* Smith, *Stenamma meridionale* Smith, *Myrmica punctiventris* Roger, *Pheidole tetra* Creighton, *Pyramica metazytes* Bolton, *P. ohioensis* (Kennedy & Schamm), *P.* reflexa (Wesson & Wesson), P. *talpa* (Weber), *Camponotus subbarbatus* Emery *Formica schaufussi dolosa* Buren, and *Polyergus lucidus longicornis* Smith (a new genus and species for Mississippi).

*Discothyrea testacea* is a minute proceratiine ant that lives in soil and leaf litter. Although *Discothyrea testacea* was first described in 1863, it was not collected again until 1948 (Smith, M.R. & Wing, 1955). No mention of this species was even made in "The Ants of North American" (Creighton, 1950) or in Smith's paper covering the genera of the United States (Smith, M.R., 1947). Because of the advent of more modern collecting techniques such as the Berlese funnel, and Winkler sack, this ant has been found in the southeastern United States with regularity and is no longer considered rare. Two of the specimens collected in this study were found under *Carya* sp. (hickory) in litter, while the other 3 specimens were found in litter under *Pinus taeda* and all were extracted in a Berlese funnel. The distribution for this ant in the United States is North Carolina south to Florida, and Oklahoma (Smith, D. R., 1979).

*Ponera exotica* is a tiny ponerine ant found in soil and leaf litter. This ant was described only in 1962 by M. R. Smith (Smith, M. R., 1962) who considered it an exotic

species. Johnson (Johnson, C., 1987) later gave a good argument that it was, in fact, just an rarely collected native ant. This ant was found at sites 3, 4, 5, 7, 8, and 9 in soil and litter samples. *Ponera exotica* has a southern distribution and was expected to be found in Mississippi.

*Myrmica punctiventris* was collected at four sites, with 27 specimens being collected in pitfall traps at Site 1, 1 specimen from site 5, two specimens from site 4, and 6 individuals collected in litter samples at Site 6. The distribution given for this species in the United States is from Massachusetts south to Georgia, west to Iowa, Nebraska, and Arkansas (Smith, D. R., 1979).

*Stenamma meridionale*, described in 1957 by Marion R. Smith, is active in the cooler months of the year in Mississippi and doesn't appear to be uncommon. Forty specimens of this species were collected at sites 2, 3, 4, 5, and 9 in pitfall traps, litter samples, and general collecting. The distribution of *Stenamma meridionale* is given by Smith (1979) as extending from Virginia south to Georgia and west to Illinois and Arkansas.

The *Camponotus subbarbatus* specimens were found primarily in pitfall traps at site 3 (126 specimens), with 1 specimen found in a pitfall trap at site 2, an additional 20 specimens found at site 9 on dead trees or coming to tuna bait, 1 specimen collected while beating trees at site 4, and two specimens collected while gathering hickory nuts at site 5. While Snelling mentions *Camponotus subbarbatus* as being found as far south as Mississippi (Snelling, R.R., 1988), he does not give any specific records from Mississippi, so this species is presented as a new record for the state. D. R. Smith (1979) gives the distribution of *Camponotus subbarbatus* as New York south North Carolina and west to Michigan, Iowa, and Kansas.

*Pheidole tetra* was found nesting in the soil at sites 8 and 18. This is the first reported occurrence of *P. tetra* east of the Mississippi River. The two sites where the *Pheidole tetra* specimens were collected are both found on open ridgetops in mixed forest. The soil was sandy at both localities, and coincidentally, both areas were at old cemetery sites (Noxubee Hill Cemetery and Turner Cemetery). Previously, this ant was only known from the Quachita Mountains of Arkansas, St. Louis Missouri, western and central Texas, and the mountains of southern Arizona at 1280-1580 m (Wilson, E. O., 2003).

*Pyramica metazytes* was previously known from only 1 specimen from Kentucky, Edmonton Co., Mammoth Cave Nat. Park and 4 specimens from Tennessee, Sevier Co., Chilhowee Mts.

*Pyramica ohioensis*, *P. reflexa*, and *P. talpa* all have a southeastern distribution and were not unexpected in Mississippi.

*Formica schaufussi dolosa* was collected at site 5 on a ridgetop nesting in the soil in the middle of a trail, at site 12 in an open area surrounding Choctaw Lake, at site 8 in the nest of *Polyergus lucidus longicornis*, at sites 12 and 18 nesting in sandy soil on a ridge, and at site 6 running on the ground on an old dirt road on a ridge. The distribution of this ant is given as extending from Virginia to Florida, west to Iowa, Colorado, and Texas and was not unexpected in Mississippi (Smith, D. R., 1979).

A large nest of *Polyergus lucidus longicornis*, a slave making ant, was found at site 8 on 10 July 2003 in the soil at the base of *Quercus falcata* Michx. var. *pagodafolia* Ell. (cherry bark oak). The oak was an old tree standing in an open area near a parking

area near the Noxubee Hill Cemetery in Winston County. The nest was found just beneath the leaf litter in the soil and interwoven around roots. The size of the nest was not obvious but it exceeded 50 cm in diameter and at least 30 cm deep, with total size estimations limited due to difficulty of digging beyond roots. Winged females were present and a large chamber with pupae was discovered about 20 cm below the soil surface. The slaves present were all *Formica schaufussi dolosa*. Previous records of *Polyergus lucidus longicornis* are from North Carolina (Carter, 1962), South Carolina, and Georgia (Smith, D. R., 1979).

Other significant and/or interesting species collected iin the survey included *Amblyopone pallipes* (Haldeman), *Aphaenogaster mariae* Forel and *Pyramica angulata* (Smith). *Amblyopone pallipes* is a large cryptic ant found in soil and under rotting logs. It is rarely collected, though relatively common throughout the United States. This primitive ant feeds primarily on chilopods (centipedes) and possesses very unusual large mandibles with bidentate teeth. This species was found at sites 3, 4, 5, & 17. *Aphaenogaster mariae* is a somewhat rare myrmicine ant that is said to be a temporary parasite of *Aphaenogaster fulva* Roger (Smith, D. R., 1979), an ant commonly found in this study. *Aphaenogaster mariae* was found at sites 2, 5, 8, & 9, but the only nest was found at site 9 in a dry, dead tree that had been downed in a storm. A series of workers was collected at site 8 at peanut butter bait that had been applied to the bark of *Quercus falcata* var. *pagodafolia*. The only other collections of this ant were of dealated queens found in soil at the base of *Quercus falcata* var. *pagodafolia* (2 individuals) and *Fagus grandifolia* (1 individual), and in a pitfall trap in deciduous forest (1 individual). *Pyramica angulata* is considered to be a rare species with a limited distribution (Bolton, 2000).

**Discussion.** The Tombigbee National Forest includes several different habitats ranging from mixed mesic forests with rich herbaceous understories on sloped ravines to piney ridgetop areas with somewhat sandy soil to open fields (especially along powerline cuts and roads). In addition to these basic habitats there are seepage areas, bogs, criss-crossings of creeks, ponds, and even a lake (Choctaw Lake). While some ants are generalists and can be found in many habitats, others are restricted to specific habitats or microhabitats, such as in a log, in leaf litter, in twigs of trees and shrubs, in grass stems, in acorns, or in hickory nuts.

It can be hypothesized that diversity of ant species and diversity of flora is correlated. Indeed, this seems to be the case at Tombigbee N. F. if one considers the rich mixed mesic forests to be diverse as compared to a roadside (for example). Typical ants that can seen along roadsides, in powerline cuts, and other open areas include *Pheidole bicarinata* Mayr, *Crematogaster lineolata* (Say), *Monomorium minimum* (Buckley), *Solenopsis invicta* Buren, *Solenopsis richteri* X *invicta*, *Forelius pruinosus* (Roger), *Paratrechina vividula* (Nylander), and less commonly *Pheidole metallescens* Emery. Only a few specimens of *Solenopsis invicta* (southern red fire ant) were collected during this study, from Site 8, one of the more southern sites in the survey. All other species of *Solenopsis* in this group were identified as hybrids of *S. invicta* and *S. richteri* Forel, *S. richteri* X*invicta*. Hypoponera *opaciceps* (Mayr) is a fairly uncommon species, but was seen in large numbers on the roadside in piles of pine bark that had been left from a logging cut. *Stenamma foveolocephalum* Smith was not collected during this study, but

is reported as being found in the Tombigbee N. F., especially on roadside cuts made by grading equipment (Dubois, M.B., L.R. Davis, Jr. 1998). *Stenamma foveolocephalum* was known from only two specimens, one of which was lost, prior to the Dubois paper and was rediscovered by Dubois. This rare species of *Stenamma* is only active in the winter months and that may explain its rarity to some degree. Most of above mentioned "roadside" ants can be found crawling and nesting on the ground, except for *Crematogaster*, which is usually more arboreal but may forage on the ground, and the *Hypoponera*. All of these ants, except the *Pheidole metallescens*, *Hypoponera*, and *Stenamma*, were readily collected with both tunafish and hotdog bait. The *Pheidole bicarinata* was especially attracted to cookie crumbs.

Several species of ants were found in an area along Sheep Ranch Road that had sustained considerable damage in the form of many downed trees from a severe storm several months earlier. Ants collected by beating dead limbs included *Crematogaster ashmeadi* Mayr, *C. lineolata, Camponotus americanus* Mayr, *C. chromaiodes* Bolton, *C. decipiens* Emery, C. *nearcticus* Emery, *C. snellingi* Bolton, *C. subbarbatus* Emery, and *C. pylartes fraxinicola* Smith. Additionally, *Prenolepis imparis* (Say) was found beating and often seen tending aphids. The *Camponotus subbarbatus* was a new state record for Mississippi. *Camponotus pylartes fraxinicola*, in the subgenus *Colobopsis*, is a very interesting ant that nests in twigs of trees and has a very specialized major worker caste. The major workers of this subgenus have an unusual head shape that is flattened and truncate in the front. These ants serve as living doors for the colony by filling the entrance hole to the nest with their head. When a minor worker needs to enter or exit, the major simply moves aside to open the door (Tynes, J. S., 1964, Dissertation).

Some of the same species found along ridgetops on open trails are also found along the roadsides. Nests of *Trachymyrmex septentrionalis* (McCook) can be seen on the trail on these ridgetops, and less frequently on the slopes of the ravines. *Trachymyrmex* are very interesting ants that grow underground fungus gardens. These ants live in underground nests that are sectioned off into distinct cells. Some of these cells are used to grow a specialized fungus that is grown on some sort of substrate such as insect feces, flower parts, or dead vegetable matter (Hölldolber and Wilson, 1990). *Camponotus americanus* nests are sometimes encountered on these trails. Their nests are usually submerged just beneath the surface and not very obvious as one walks by. Similarly, one can find nests of *Formica schaufussi dolosa* Wheeler and these fairly large reddish ants are often seen scrurrying along at a fast pace, especially in more open areas. *Temnothorax pergandei floridanus* Emery and *Aphaenogaster treatae* Forel were found nesting under leaf litter in the soil on a trail. Both *Paratrechina arenivaga* (Wheeler) and *P. parvula* (Mayr) were found nesting in sandy soil on a sandy ridgetop near Turner cemetery in Choctaw County. *Pseudomyrmex pallidus* (Smith) and *Monomorium minimum* were collected in the culms of grasses along a trail, whereas*Crematogaster pilosa* Emery was collected in the hollow stems of *Vernonia gigantea*. *Polyergus lucidus longicornis* was found nesting under *Quercus falcata* Michx. var. *pagodafolia* Ell. This ant is quite interesting in that is incapable of feeding itself and requires the services of "slaves" to feed it. *Polyergus* ants raid colonies of *Formica* species where they capture pupae of the *Formica*. The pupae are carried back to the *Polyergus* nest and raised there for the purpose of becoming slaves. The nest found contained *Formica schaufussi dolosa* slaves. *Pheidole bicarinata*, *P. metallescens*, and *P. tetra* were all found nesting in the

sandy soil near Turner Cemetery (site 18), and *P. tetra* was also found at Noxubee Hill Cemetery (site 8). The minor caste of *Pheidole metallescens* is perhaps, one of the more beautifully colored ants in this area. When seen under the microscope they have a dark, almost black color with brilliant bluish to violet iridescence.

The mixed mesic forests themselves were by far the most profitable collecting areas and a substantial number of species were collected in this habitat, either on the ravine slopes or in the low areas found between the ravines. The ants here were found on and in the ground, nesting in logs and standing dead trees, and on and in trees. The most commonly collected, and probably the most common ant in these woods was *Prenolepis imparis* (Say). This ant seems to be everywhere, and indeed, it is hard to disturb the leaf litter without seeing some of them. They were also seen on tree limbs and tending aphids in and at the bases of trees. *Prenolepis* was especially common in the cooler months of the year and was seen with much less frequency in the summer. Other common ants seen running about on the forest floor and on tree trunks were *Aphaenogaster* sp. (either *A. carolinensis* Wheeler or *A.* N19, an undescribed new species according to Gary Umphrey-these species can not be separated reliably using morphological characters), *A. fulva* Roger, *Camponotus americanus*, *C. chromaiodes*, *C. pennsylvanicus* (DeGeer), *C. castaneus* (Latrielle), and *Paratrechina faisonensis* (Forel). These species listed above could probably rival *Prenolepis imparis* for being equally common in these sloped forests.

It is impossible to say if one ant is more common than another, simply because it is more visible, because many ants are not superficially obvious in their activities. Many ants that are rarely seen may be quite common in leaf litter, humus, soil, in twigs or hollow stems of plants, or in rotting or dead wood. One such example is the ubiquitous *Solenopsis molesta* (Say) that was found in nearly every Berlese sample taken. This little golden colored thief ant is minute and could easily be overlooked.

Berlese funnel samples are a wonderful way to sample leaf and soil litter. Many species either not taken from pitfall traps or from general collecting were found in this manner. In fact, some of the most interesting records were from Berlese leaf and soil litter samples and included several of the new state records. *Amblyopone pallipes* (Haldeman), a rare species of Ponerinae, was collected in litter under decaying logs, as were several other ponerines including *Discothyrea testacea* Roger (new record of a genus and species for MS), *Proceratium silaceum* Roger, *Cryptopone gilva* (Roger), *Ponera exotica* Smith (new state record), *P. pennsylvanica* Buckley (a very common ant in Berlese samples), and *Hypoponera opacior* (Forel) (another common ant). Both *Discothyrea testacea* and *Ponera exotica* are very small ants that are rarely collected.

Several species of myrmicine ants were collected either from leaf and soil litter or in the pitfall traps and included *Stenamma meridionale* Smith (rare ant, active in winter), *Pheidole dentata* Mayr (common), *P. dentigula* Smith, *P. tysoni* Forel, *Crematogaster minutissima* Mayr (a tiny yellowish ant), *Temnothorax curvispinosus* Mayr, *T. schaumi* Roger, and *Myrmecina americana* Emery.

Some of the most unique ants collected were the *Strumigenys* and *Pyramica*, which were also myrmicines. Only one species of *Strumigenys* was collected, *S. louisianae* Roger, but several species of *Pyramica* were found, including *Pyramica angulata* (Smith) (a rarely collected species), *P. clypeata* (Roger), *P. creightoni* (Smith), *P. dietrichi* (Smith), *P. metazytes* Bolton (new state record), *P. ohioensis* (Kennedy &

Schramm) (new state record), *P. ornata* (Mayr), *P. rostrata* (Emery), *P. pulchella* (Emery) and *P. talpa* (Weber) (new state record). These dacetine records are significant as a two-volume book on the Dacetini was published recently by Barry Bolton (2000), and even though he looked at thousands of specimens, he did not have some of these records from Mississippi. *Pyramica ohioensis* , *P. metazytes,* and *P. talpa* were reported from Mississippi for the first time in 2004 (MacGown, J. A., et al, 2004).

One unique microhabitat utilized by several species of ants was the hickory nut. Three species of hickory nuts, *Carya glabra, C. ovata,* and *C. tomentosa,* were collected on a ravine slope at the Tanksley Cemetery site and cracked open in the laboratory in an attempt to find ant colonies. Several colonies of ants found, including 3 colonies of *Crematogaster lineolata* (Say) with 136, 46, and 4 workers respectively, one colony of *Crematogaster minutissima* Mayr with 5 workers and 10 queens, one colony of *Temnothorax pergandei floridanus* Emery with 76 workers and 1 queen present, and one colony of *Temnothorax curvispinosus* Mayr with 36 workers and 1 queen. In addition, two specimens of *Camponotus subbarbatus* Emery were found in a nut. Colonies were only found in the nuts of *Carya glabra* (pignut hickory), and this was perhaps due to the thinner shell of this species of hickory. This means of collecting ants in nuts proved to be the most profitable way to find *Temnothorax curvispinosus*, *T. pergandei floridanus, Crematogaster lineolata* and *Crematogaster minutissima*.

Several other notable species were found either crawling about the forest floor and/or in Berlese litter samples or pitfall traps. Some of these species were *Brachymyrmex depilis* Emery (a minute ant), *Camponotus discolor* (Buckley) (poorly represented in the MEM collection), *C. subbarbatus* (new state record), *Lasius alienus* (Foerster) (found in low lying wet areas), *Formica pallidefulva* Latrielle, and *Formica subsericea* Say. The tearing apart of rotting logs and standing dead trees was a good means of collecting other species, especially some that were not found or were collected in extremely small numbers by other trapping methods. Three excellent examples of this are *Aphaenogaster lamellidens* Mayr, *A. mariae* Forel, and *Camponotus snellingi*. Large colonies of *Aphaenogaster lamellidens* were commonly found in rotting logs and standing dead trees with at least some part of the tree rotting, while only three specimens of this species were collected in all pitfall traps combined. A large colony of several hundred specimens of *Aphaenogaster mariae* was found in a dead tree that had been downed in a previous storm. The tree was not rotting and was actually suspended in the air a few feet as it was still partially connected at its base. A few individual dealate queens of *A. mariae* were collected in the soil at the bases of trees in close proximity of *A. fulva*. *Aphaenogaster mariae* is believed to be a temporary parasite of *A. fulva* in which the *A. mariae* queen is thought to kill the *A. fulva* queen and use the *A. fulva* workers to aid her in rearing her brood. Eventually, the *A. mariae* queen leaves and starts her colony in dead wood. *Camponotus snellingi* was found nesting in rotting wood, though more commonly in standing dead wood. Again, only one specimen of this species was collected by other methods.

For a complete list of species collected at Tombigbee National Forest see Appendix 1.

**Seasonality**. While samples of ants collected in pitfall traps are not the best possible way to show seasonality, they can show generally when ants are more active in a

given area. Basically, the most of the ants were active in the late spring through the early fall. The exceptions to this were *Stenamma meridionale* and *Prenolepis imparis*, which were both more abundant in late fall through early spring.

## Appendix 1

The list presented is arranged by subfamily and genus according to Bolton (2003). Names follow Bolton, (1995), except *Dorymyrmex*, which follows Snelling (1995), *Pyramica*, which follows Bolton (2000), *Pheidole*, which follows Wilson (2003), *Aphaenogaster*, which follows Umphrey (1996), and *Crematogaster* which follows Johnson (1988).

Site numbers (see appendix 2) are given for localities where each species was collected, notes on habitat and microhabitat are given, and new state records are presented. Information on whether or not a particular species was common or rare in the Tombigbee National Forest is given. Species collected in numbers of less than 10 were considered rare, 11-100 specimens were considered uncommon, over 100 specimens in combination with being collected at more than one locality were considered to be common, and species seen in many localities and in great numbers (thousands of specimens seen) were considered to be very common. Representives of each species were pinned and labeled, and all other samples were stored in vials with 70 to 100% ethyl alcohol. For pinned material, the total number of specimens of each species is given, including the number of each caste. For vial collections, only the number of vials containing each species is given, with no indication of number of specimens or what castes are present per vial. A total of 2019 pinned specimens and 758 vials of specimens from this study stored in the MEM collection.

### FORMICIDAE

#### Subfamily DOLICHODERINAE

##### Tribe DOLICHODERINAE

*Forelius pruinosus* (Roger). In mixed forests nesting in soil on roadsides, trails (especially on ridges), and open areas such as those created by logging or power line cuts. Sites 6, 7, 9, 12, 18, and 19. Very common, 30 workers pinned and 2 vial collections.

#### Subfamily FORMICINAE

##### Tribe LASIINI

*Lasius* (*Lasius*) *alienus* (Foerster). In mixed mesic forest nesting in leaf litter and in rotting logs in low, wet areas, and also crawling on shrubs in seepage area. Site 4. Common, 17 workers pinned and 2 vial collections.

##### Tribe PLAGIOLEPIDINI

*Brachymyrmex depilis* Emery. In deciduous and mixed mesic forest; pitfall traps; nesting in soil; in hollow stump; soil and litter under rotting logs; and soil at base of *Quercus falcata* var. *pagodifolia*. Sites 1, 2, 3, 5, 8, 13, 14, and 17. Very common, 2 queens (dealate) and 17 workers pinned and 19 vial collections.

*Paratrechina* (*Nylanderia*) *arenivaga* (Wheeler). In mixed forests on sandy ridge tops

and nesting in sandy soil in open areas. Sites 18 and 19. Uncommon, 6 queens (alate) and 16 workers pinned.

*Paratrechina* (*Nylanderia*) *faisonensis* (Forel). In deciduous and mixed forests; pitfall traps; nests in soil under leaf litter; nests under litter on ravine slopes; soil and litter in seepage area; soil and litter under dead hardwood logs; nest in soil under litter on large dirt pile in open area on ridge; at hotdog bait; nest in soil at base of *Quercus* sp.; and nest in soil at base of *Quercus falcata* var. *pagodifolia*. Sites 1, 2, 3, 4, 5, 8, 9, 13, 14, 16, and 17. Very common, 7 queens (alate), 6 males (alate), and 82 workers pinned and 55 vial collections.

*Paratrechina* (*Nylanderia*) *parvula* (Mayr). In mixed forest in nest under leaf litter in sandy soil at the edge of an opening adjacent to mixed forest and at edge of trail on ridge. Sites 5 and 18. Uncommon, 1queen (altate), 2 males (alate) and 27 workers pinned and 1 vial collection.

*Paratrechina* (*Nylanderia*) *vividula* (Nylander). In mixed forest; nesting along roadsides, fields, and other open areas; under bark; and nest in soil at base of *Quercus falcata* var. *pagodifolia*,. Sites 6, 8, and 9. Very common, 3 queens (alate), 2 males (alate), and 21 workers pinned and 5 vial collections.

*Prenolepis imparis* (Say). In deciduous and mixed forests; pitfall traps; nests in soil and leaf litter; nests in rotting logs; tending aphids on downed *Pinus* sp.; crawling on plants (both herbaceous and woody); at base of *Quercus falcata* var. *pagodifolia*. This species also was found in a nest in the soil at the base of *Carya* sp. with a large number of *Longistigma caryae* (Harris) (*Longistigma caryae* is the largest aphid in the United States having a body length of about 6 mm). Sites 1, 2, 3, 4, 5, 8, and 9. Very common ant, especially in the cooler months, 1 queen (dealate), 3 males (alate), and 33 workers pinned and 98 vial collections.

Tribe CAMPONOTINI

*Camponotus* (*Camponotus*) *americanus* Mayr. In deciduous and mixed forests; pitfall traps; nests in soil under leaf litter; in soil under litter on trail on ridge; nest in rotting log on ground; crawling on dead trees in storm damaged area; and under bark of dead hardwood on ravine slope. Sites 1, 2, 3, 5, 9, and 17. Very common, 2 queens (1 alate, 1 dealate), 2 males (alate), 1 major worker, and 16 minor workers pinned and 74 vial collections.

*Camponotus* (*Camponotus*) *chromaiodes* Bolton. In deciduous and mixed forests; pitfall traps; nesting in soil and rotting wood; crawling on trees in storm damaged area; at hotdog bait on roadside; crawling on dead *Pinus* sp.; in litter at base of *Pinus* sp.; and nest in soil at base of *Quercus* sp. Sites 1, 2, 3, 7, 9, 14, and 18. Very Common, 43 minor workers, 17 minor workers pinned and 63 vial collections.

*Camponotus* (*Camponotus*) *pennsylvanicus* (DeGeer). In deciduous and mixed forests; pitfall traps; nests in rotting logs; crawling on ground in open area near lake; at cookie bait in open area on ridge; at hotdog bait; on recently killed *Carya* sp.; and in soil at base of *Quercus falcata* var. *pagodifolia*. Sites 1, 2, 3, 4, 5, 8, and 12. Very common, 2 males (alate), 18 major workers, and 12 minor workers pinned and 53 vial collections.

*Camponotus* (*Colobopsis*) *pylartes fraxinicola* Smith. In mixed forest on branches of

dead trees along roadside and on dead tree on ridge in woods. Site 5 and 9. Not many specimens were collected of this species, however, it is probably quite common here, 3 minor workers.

*Camponotus* (*Myrmentoma*) *decipiens* Emery. In mixed forest crawling on branches of dead trees near roadsideand in woods. Site 9. Uncommon, 3 minor workers pinned.

*Camponotus* (*Myrmentoma*) *discolor* (Buckley). In deciduous forest, pitfall trap. Site 3. Rare, 1 major worker pinned.

*Camponotus* (*Myrmentoma*) *nearcticus* Emery. In mixed forest on branches of dead trees near roadside and on dead *Pinus* sp. Site 9. Uncommon, 2 major workers and 11 minor workers pinned.

*Camponotus* (*Myrmentoma*) *snellingi* Bolton. In deciduous and mixed forests; nests in rotting trees and logs; under bark of dead *Cornus florida* on ridge; under bark of dead section of live *Quercus falcata* Michx. var. *pagodifolia* on ridge; and in twigs of *Q. falcata* Michx. var. *pagodifolia*. Sites 5, 7, 8, 9, and 18. Common, 1 queen (alate), 4 major workers, and 20 minor workers pinned and 2 vial collections.

*Camponotus* (*Myrmentoma*) *subbarbatus* Emery. New State Record**.** In deciduous and mixed forest; pitfall traps; on dead trees at road edge; and at tuna bait on ridge; crawling on shrubs in seepage area; in rotting hickory nuts (*Carya glabra*) on ground at the base of ravine; and on dead *Pinus* sp. Sites 2, 3, 4, 5 and 9. Common, 9 majors and 67 workers pinned and 7 vial collections.

*Camponotus* (*Tanaemyrmex*) *castaneus* (Latrielle). In deciduous and mixed forests; pitfall traps; on dead *Pinus* sp.; and nest in soil at base of *Fagus grandifolia* seepage area. Sites 1, 2, 3, 4, and 9. Very common, 1 queen (alate) and 9 workers pinned and 49 vial collections .

Tribe FORMICINI

*Formica* (*pallidefulva* group) *pallidefulva* Latrielle. In deciduous and mixed forests; pitfall traps; soil and leaf litter; and nests in soil just under leaf litter. Sites 3, 8. Common, 11 workers pinned and 8 vial collections.

*Formica* (*pallidefulva* group) *schaufussi dolosa* Buren. In mixed forests; nests in soil under leaf litter on trails on piney ridgetop; seen running on ground in open areas including trails, cutovers, and powerline cuts; nest in soil at base of*Quercus falcata* Michx. var. *pagodifolia* (slaves of *Polyergus lucidus longicornis*). Sites 3, 5, 6, 8, 12, and 18. Common, 14 workers pinned and 3 vial collections.

*Formica* (subsericea complex) *subsericea* Say. In deciduous and mixed forests in pitfall traps. Sites 1, 2, 3, and 5. Common, 20 workers pinned and 2 vial collections.

*Polyergus lucidus longicornis* Smith. In mixed forest nesting at base of*Quercus falcata* var. *pagodifolia* with *Formica schaufussi dolosa* slaves. Site 8. Rare, 2 queens (alate) and 9 workers pinned and 1 vial collection.

Subfamily PSEUDOMYRMECINAE

*Pseudomyrmex pallidus* (Smith). In culms of *Sorghum halepense* (L) (Johnson grass) along trail on ridgetop in cut over pine area. Site 6. Uncommonly encountered, 2 queens (alate) and 6 workers pinned and 1 vial collection.

Subfamily AMBLYOPONINAE

Tribe AMBLYOPONINI

*Amblyopone pallipes* (Haldeman). In deciduous and mixed forests; pitfall traps; in soil and litter; soil and litter at base of *Pinus taeda*; under rotting *Quercus* sp. and other hardwood logs on ground. Sites 3, 4, 5, and 17. Uncommon, 2 queens (dealate) and 14 workers pinned.

Subfamily PONERINAE

Tribe PONERINI

*Cryptopone gilva* (Roger). In deciduous forest in soil and leaf litter. Site 3. Rare, 5 workers pinned.

*Hypoponera opaciceps* (Mayr). In piles of pine bark on roadside (bark left from a logging cut). Site 6.. Uncommon, but locally abundant, 16 workers pinned.

*Hypoponera opacior* (Forel). In deciduous and mixed forests; pitfall traps; soil and leaf litter; under bark of dead trees; soil and litter under *Quercus* sp. log; soil at base of *Quercus falcata* var. *pagodifolia*; soil and litter at base of *Quercus* sp.; soil at base of *Pinus* sp.; soil under rotting *Pinus* sp. log on ground; soil at base of *Carya* sp.; and crawling on sand by creek. Sites 1, 2, 3, 4, 5, 8, 9, 13, 14, 16, and 17. Very common, 11 queens (dealate) and 39 workers pinned and 8 vial collections.

*Ponera exotica* Smith. New State Record. In mixed and decidous forests; general collecting-soil and leaf litter; soil under *Quercus* sp. log; soil at base of *Fagus grandifolia*; soil and litter at base of *Nyssa sylvatica*; soil and litter at base of *Carya* sp. on ravine slope; and litter at base of *Pinus taeda* on slope. Sites 3, 4, 5, 7, 8, and 9. Uncommon, 36 workers pinned. .

*Ponera pennsylvanica* Buckley. In deciduous and mixed forests; pitfall traps; general collecting-soil and leaf litter; soil and leaf litter in seepage area; soil under rotting logs; in hollowed out rotten log on ravine slope; soil and litter at base of *Quercus* sp.; soil at base of *Quercus falcata* var. *pagodifolia*; and nests in hickory nuts (*Carya glabra*) on ground at ravine base. Sites 1, 2, 3, 4, 5, 8, 13, 14, 16, and 17. Very common, 7 queens (dealate) and 79 workers pinned and 12 vial collections.

Subfamily PROCERATIINAE

Tribe PROCERATIINI

*Discothyrea testacea* Roger New State Record. In mixed forest in soil of hollow base of *Carya* sp. tree on slope and litter at base of *Pinus taeda* on slope. Site 3 and 5. Rare, 5 workers pinned.

*Proceratium croceum* (Roger). In mixed mesic forest, at blacklight at white sheet in sweet bay bog, in seepage area, and on a ravine slope near a creek. Sites 4, 20, and 21. Uncommon, 12 males pinned.

*Proceratium silaceum* Roger. In mixed forest in soil of hollow base of *Carya* sp. and litter at base of *Pinus taeda* on ravine slope. Site 3 and 5. Rare, 1 queen (dealate) and 1 worker pinned.

Subfamily MYRMICINAE

Tribe DACETINI

*Pyramica angulata* (Smith). In deciduous and mixed forests in soil and leaf litter and in soil at base of *Quercus falcata* var. *pagodifolia*. Sites 7, 8, 9, and 17. Rare, 1 queen (dealate) and 9 workers pinned.

*Pyramica clypeata* (Roger). In deciduous forest in soil under rotting log at base of

ravine and in soil and litter at base of *Carya ovata*. Sites 5 and 9. Rare, 3 workers pinned.

*Pyramica creightoni* (Smith). In mixed forest in litter at base of *Pinus taeda* on ridge. Site 5. Rare, 6 workers pinned.

*Pyramica dietrichi* (Smith.) In mixed forest in soil and leaf litter at base of *Carya ovata* and in soil at base of *Quercus falcata* var. *pagodifolia*. Site 5, 8, and 9. Rare, 3 queens (dealate) and 1 worker pinned.

*Pyramica metazytes* Bolton. New State Record. In deciduous forest in soil and leaf litter at the base of *Carya* sp. at the base of a ravine. Site 5. Rare, 1 worker pinned.

*Pyramica ohioensis* (Kennedy and Schramm). New State Record. In deciduous and mixed forests in soil and litter and in soil and litter at base of *Carya* sp. on ravine slope. Site 2, 5, and 16. Rare, 3 workers pinned.

*Pyramica ornata* (Mayr). In deciduous and mixed forests; pitfall traps; soil and leaf litter; in soil and litter under and near rotting log on ravine slope; soil and litter at base of *Carya* sp. tree on ravine slope; soil under *Quercus* sp. log; and soil at base of *Quercus falcata* var. *pagodifolia*,. Site 3, 5, 8, 16, and 17. Uncommon, 3 queens (2 alate, 1 dealate) and 51 workers pinned.

*Pyramica pulchella* (Emery). In decidous and mixed forests in soil and litter at base of dead *Quercus* sp and litter and in soil at base of *Quercus falcata* var. *pagodifolia*. Sites 8 and 17. Rare, 1 queen (dealate) and 3 workers pinned.

*Pyramica reflexa* (Wesson and Wesson). New State Record. In deciduous forest in soil and leaf litter at base of *Carya* sp. at the base of a ravine. Site 5. Rare, 1 queen (dealate) and 1 worker pinned.

*Pyramica rostrata* (Emery). In deciduous and mixed forests; pitfall traps; soil and leaf litter; litter in seepage area; soil and litter under rotting log on ravine slope; soil and litter at base of *Carya* sp. tree on ravine slope; and litter at base of *Pinus taeda* on ridge. Sites 1, 2, 4, 5, 16, and 17. Uncommon, 3 queens (dealate) and 60 workers pinned.

*Pyramica talpa* (Weber). New State Record. In deciduous and mixed forests in pitfall trap and in soil and leaf litter beside road cut. Sites 2 and 8. Rare, 1 queen (dealate) and 1 worker pinned.

*Strumigenys louisianae* Roger. In deciduous and mixed forests; pitfall traps; soil and leaf litter; in leaf litter in seepage area; soil under rotting log at ravine base; soil in hollow base of *Carya* sp.; litter at base of *Pinus* sp.; soil under *Quercus* sp. log on ground; soil at base of dead *Quercus* sp. tree (still standing); and soil at base of *Quercus falcata* var. *pagodifolia*, . Sites 1, 2, 3, 4, 5, 8, 14, and 17. Common, 3 queens (dealate) and 45 workers pinned and 1 vial collection.

Tribe ATTINI

*Trachymyrmex septentrionalis* (McCook). In deciduous and mixed forests; pitfall traps; nests on slopes; nests in soil on open piney ridgetops; and nests in soil in clear cuts and powerline cuts. Sites 1, 3, and 10. Common, 16 workers pinned and 6 vial collections.

Tribe STENAMMINI

*Stenamma foveolocephalum* Smith (Dubois, 1998). On roadcuts in mixed forest. Rare (no specimens collected during this study, but recorded from this National Forest by M. Dubois (1998).

*Stenamma meridionale* Smith. New State Record. In deciduous and mixed forests; pitfall traps; nesting in soil under litter; and litter at base of *Pinus taeda*. Sites 2, 3, 4, 5, and 9. Uncommon, 2 queens (dealate) and 40 workers pinned.

Tribe SOLENOPSIDINI

*Monomorium minimum* (Buckley). In mixed forests, with little understory; nesting in soil on roadsides and in low areas; nests in litter in mixed forest; in soil and leaf litter in seepage area; on ground in open park area by lake; collected at tuna bait on roadside; nest under bark of dead *Pinus* sp.; nesting in culms of Johnson grass (*Sorghum halepense*) along trail on piney ridgetops; and nest under bark of *Quercus falcata* var. *pagodifolia*. Sites 4, 6, 7, 8, 9, 12, 16, and 19. Very common, 1 queen (dealate) and 25 workers pinned and 4 vial collections.

*Solenopsis invicta* Buren. In mixed forest, crawling on ground and at tuna bait in open area on ridge at base of *Quercus falcata* var. *pagodifolia*. Site 8. Common, 2 major workers and 6 minor workers pinned.

*Solenopsis invicta* X *richteri* . In deciduous and mixed forests; pitfall traps; nesting along roadsides and open areas, including powerline cuts and wider trails; nests in rotting logs in open area in mixed forest; at tuna bait in open area on ridge; also seen tending aphids on grass stems; and soil at base of *Quercus falcata* var. *pagodifolia*. Sites 1, 4, 6, 8, 9, 12, 18, 19 and seen along the dirt roads throughout the National Forest. Very common, 1 dealate queen, 13 major workers, and 24 minor workers pinned and 5 vial collections.

*Solenopsis molesta* (Say). In deciduous and mixed forests; pitfall traps; small nests in soil beneath leaf litter;, nest in soil under rotting logs in mixed forest, in soil in open area on powerline cut, in hollow stump; in sand and litter by creek in seepage area; in soil at base of *Fagus grandifolia*; in soil and litter at base of *Pinus taeda*; in soil at base of *Quercus falcata* var. *pagodifolia*; under bark of *Quercus falcata* var. *pagodifolia*; and nesting in rotting hickory nuts (*Carta gkabra*) on ground at the base of ravine. Sites 1, 2, 3, 4, 5, 8, 9, 13, 14, 13, 16, and 17. Very common, 2 queens (dealate) and 36 workers pinned and 67 vial collections.

Tribe MYRMICINI

*Myrmica punctiventris* Roger. New State Record. In deciduous and mixed forests; pitfall traps; at base of *Fagus grandifolia* in seepage area; and under rotting log at ravine base. Site 1, 4, 5, and 6. Uncommon, 36 workers pinned.

Tribe PHEIDOLINI

*Aphaenogaster* sp. This species is in the very difficult *Aphaenogaster fulva-rudis-texana* group and is either *A. carolinensis* Wheeler or *A.*. new species N19 (Umphrey, 1996). These two species can not be separated reliably based on morphological characters. In deciduous and mixed forests; pitfall traps; nesting in soil and under rotting logs; soil on ridges under litter; soil in seepage area; soil and litter at base of *Quercus* sp. tree; and soil at base of *Quercus falcata* var. *pagodifolia*. Sites 1, 2, 3, 4, 5, 7, 8, 13, 16, and 17. Very common. 5 queens (dealate) and 70 workers pinned and 68 vial collections.

*Aphaenogaster fulva* Roger. In deciduous and mixed forests; pitfall traps; nesting in rotting logs, hollow stumps, or in soil at base of trees and under logs; litter near seep; soil and litter in hollow base of *Carya* sp. on ravine slope; in *Pinus* sp. log

on ground; soil and litter at base of dead *Quercus* sp. tree; and nest in soil at base of *Quercus falcata* var. *pagodifolia*. Sites 1, 2, 3, 4, 5, 8, 9, 13. 17, and18. Very common. 3 queeens (dealate) 67 workers, , and 1 male pinned and 41 vial collections.

*Aphaenogaster lamellidens* Mayr. In deciduous and mixed forests; pitfall traps; nesting in rotting logs and standing dead trees; soil at the base of dead trees; nest in standing dead *Pinus* sp. tree; soil under rotting*Quercus* sp. log; under bark of live *Quercus falcata* var. *pagodifolia*; and soil at base of *Quercus falcata* var. *pagodifolia*, Sites 3, 4, 5, 7, 8, 17, and 18. Very common, 23 workers pinned and 10 vial collections.

*Aphaenogaster mariae* Forel. In deciduous and mixed forests; pitfall trap (one queen); nest in dead hardwood tree downed in storm; queen found in soil at base of *Fagus grandifolia*; 2 queens found in soil at base of *Quercus falcata*. var. *pagodifolia*; and workers found at peanut butter on *Quercus falcata*. var. *pagodifolia* tree. Queens at two locations were found in soil in close proximity with *Aphaenogaster fulva* colonies. Sites 2, 5, 8, and 9. Uncommon, 4 queens (dealate) and 47 workers pinned and 1 vial collection.

*Aphaenogaster treatae* Forel. In mixed forest nesting in soil on trail edge on ridge. Site 5. Uncommon, 9 workers pinned.

*Pheidole bicarinata* Mayr. In mixed forest; nesting in ground on roadsides and open areas (powerline cuts, logging cuts, and fields); sandy soil in open area on ridge; at cookie bait in open area on ridge; under litter on ravine slope; soil and litter at base of *Quercus falcata* var. *pagodifolia*. Sites 5, 7, 8, 9, 16, and 18. Very common, 16 major workers and 55 minor workers pinned and 1 vial collection.

*Pheidole dentata* Mayr. In deciduous and mixed forests; pitfall traps; nests in and under rotting logs; crawling on shrubs in mixed forest on ridge; nest in *Pinus taeda* log suspended above ground in storm damaged area; soil and litter at base of *Quercus* sp.; and nest in soil at base of *Quercus falcata* var. *pagodifolia*. Sites 1, 2, 3, 4, 5, 8, 10, 16, and 17. Very common, 5 queens (alate), 6 majors, and 42 minors pinned and 28 vial collections.

*Pheidole dentigula* Smith. In deciduous and mixed forests; pitfall traps; nesting in soil under leaf litter; soil and leaf litter near seepage area; under rotting *Pinus* sp.and other logs; in soil and litter at base of *Quercus* sp.; and nest in soil at base of *Quercus falcata* var. *pagodifolia*. Sites1, 2, 3, 4, 5, 8, 13, 14, 16, and 17. Very common, 5 queens (dealate), 18 major workers, and 109 minor workers pinned and 14 vial collections.

*Pheidole metallescens* Emery. On powerline cut and nesting in sandy soil on ridge in open area. Site 7 and 18. Uncommon, 4 major workers and 6 minor workers pinned and 1 vial collection.

*Pheidole tetra* Creighton. New State Record. In mixed forest nesting under litter near gravel parking area and in sandy soil in open area on ridge. Site 8 and 18. Uncommon, 17 major workers and 24 minor workers pinned and 1 vial collection (154 specimens total specimens counting both pinned and specimens in vial with a total of 34 major workers and 120 minor workers).

*Pheidole tysoni* Forel. In deciduous and mixed forests; pitfall traps; nesting under litter on dirt pile near gravel parking area; in soil and litter at base of *Quercus* sp.; in

open field near road; and soil at base of *Quercus falcata* var. *pagodifolia*. Sites 1, 2, and 8. Uncommon, 8 major workers and 45 minor workers pinned and 7 vial collections.

Tribe CREMATOGASTRINI

*Crematogaster* (*Cremogaster*) *ashmeadi* Mayr. In deciduous and mixed forests; pitfall traps; in litter; crawling on trees and shrubs; and on dead *Pinus* sp. Sites 1, 3, 4, 5, and 9. Common, 27 workers pinned.

*Crematogaster* (*Cremogaster*) *lineolata* (Say). In deciduous and mixed forests; pitfall traps; nest under litter; on dead trees near road; at tuna bait on roadside; at hotdog bait; at cookie bait in open area on ridge; soil and litter at base of *Pinus taeda*; soil and litter at base of *Quercus falcata* var. *pagodifolia*; and nests found in rotting hickory nuts (*Carya glabra)* on ground at the base of ravine. Sites 3, 5, 8, 9, and 17. Very common, 45 workers pinned and 17 vial collections.

*Crematogaster* (*Cremogaster*) *pilosa* Emery. In hollow stems of *Vernonia gigantea* along trail on piney ridgetop and collected by beating trees and shrubs at spring seep. Sites 4 and 6. Common, 12 workers pinned and 2 vial collections.

*Crematogaster* (*Orthocrema*) *minutissima* Mayr. In deciduous and mixed forests; pitfall traps; nests in soil beneath leaf litter; nest in soil under rotten *Pinus* sp. tree, collected by beating recently killed *Carya* sp. tree; and nests in old hickory nuts (*Carya glabra*) on ground at base of ravine;. Sites 3, 5, 14, and 17. Very common, 7 workers pinned and 4 vial collections.

Tribe FORMICOXENINI

*Temnothorax curvispinosus* Mayr. In deciduous and mixed forests; pitfall traps; soil and leaf litter; beating trees in seepage area; beating trees and shrubs; beating recently killed *Carya* in mixed forest; litter at base of *Pinus taeda* on ridge; soil at base of *Quercus falcata* var. *pagodifolia*; nests found in old hickory nuts (*Carya glabra*) on ground at base of ravine. Sites 1, 2, 3, 4, 5, 7, and 8. Very common, 1 queen (dealate) and 32 workers pinned and 9 vial collections.

*Temnothorax pergandei floridanus* Emery. In deciduous and mixed forests; nesting in soil under leaf litter on trail on ridge; and nests found in rotting hickory nuts (*Carya glabra*) on ground at the base of ravine. Sites 5 and 8. Uncommon, 16 workers pinned and 2 vial collections.

*Temnothorax schaumi* Roger. In deciduous forest, pitfall trap. Site 2. Uncommon, 2 workers pinned.

Tribe MYRMECININI

*Myrmecina americana* Emery. In deciduous and mixed forests; pitfall traps; nesting in soil and litter; leaf litter in seepage area; soil under rotting logs; sand and litter by creek; litter at base of *Nyssa sylvatica*; litter at base of *Pinus taeda*; soil and litter at base of *Quercus* sp.; and soil at base of *Quercus falcata* var. *pagodifolia*. Sites 3, 4, 5, 8, 9, 13, 14, 16, and 17. Very common 15 queens (dealate) and 62 workers pinned and 4 vial collections.

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