

2004

Species diversity and biogeography of ants (Hymenoptera: Formicidae) in Louisiana with notes on their ecology

Shawn T. Dash

Louisiana State University and Agricultural and Mechanical College

Follow this and additional works at: https://digitalcommons.lsu.edu/gradschool_theses



Part of the [Entomology Commons](#)

Recommended Citation

Dash, Shawn T., "Species diversity and biogeography of ants (Hymenoptera: Formicidae) in Louisiana with notes on their ecology" (2004). *LSU Master's Theses*. 2215.

https://digitalcommons.lsu.edu/gradschool_theses/2215

This Thesis is brought to you for free and open access by the Graduate School at LSU Digital Commons. It has been accepted for inclusion in LSU Master's Theses by an authorized graduate school editor of LSU Digital Commons. For more information, please contact gradetd@lsu.edu.

**SPECIES DIVERSITY AND BIOGEOGRAPHY OF ANTS (HYMENOPTERA:
FORMICIDAE) IN LOUISIANA, WITH NOTES ON THEIR ECOLOGY**

A Thesis
Submitted to the Graduate Faculty of the
Louisiana State University and
Agricultural and Mechanical College
In partial fulfillment of the
Requirements for the degree of
Master of Science

In

The Department of Entomology

by
Shawn T. Dash
B.S., University of Delaware, 2002
December 2004

Dedication

This work is dedicated to my mother, who got up before dawn to take me bird watching when I was young, who “allowed” me to use the bathtub for my turtles, who never minded hundreds of bottles and cans of insects in the freezer.

Two other people share responsibility for who I am today, and I dedicate this work to them as well. Charles Bartlett who is a teacher, a mentor, and a life-long friend and Jake Bowman, without his advice on science and life I may never have made it.

Acknowledgements

Many persons contributed to my research and this letter is in the spirit of gratitude and acknowledgment. I would like to thank my major professor Dr. Linda Hooper-Bui, who was there to lend support and offer an ear to hear my ideas. Dr. Chris Carlton who always had useful advice and suggestions to improve as a scientist and a writer. Dr. Dorothy Prowell who listened to my thoughts, and was kind enough to allow me to use specimens from her ongoing research .

A number of people lent their time and energy to this project, Andrew Cline provided hours of conversation and methodology (especially the skill of sifting). He also generously gave me specimens for my analysis and often joined me in the field. A heart-felt thank you to Michael Seymour who photographed the majority of species and aided me in the creation of the distributional maps. A very special acknowledgment must be give to Dr. John Moser who always encouraged me to strive for more and was always willing to talk science; he was also kind enough to donate a number of specimens. Other persons who have made major contributions of specimens included, M. Seymour, D. Colby, A. Tishechkin, J. Rosson, K. Landry, L. Womack, N. Nguyen, E. Watson, A T. Pranschke. I would also like to thank those who helped me in the field and in the laboratory: K. O'Brien, R. Baillif, J. Fleming, S. Scoby, N. Saucier, K. Prejean and A. Williamson. Stacy Clayton in the creation of web page supplements to my thesis.

I would also like to thank Brian Fisher and Stefan Cover for organizing “The Ant Course” which allowed me to improve and tune my taxonomic skills. I would also like to thank Kye Hudland, Lloyd Davis, Bill MacKay, James Trager, and Mark Deyrup who were always available with friendly advice and were kind enough to review my identifications.

Table of Contents

ACKNOWLEDGEMENTS.....	iii
ABSTRACT.....	v
CHAPTER	
1. INTRODUCTION.....	1
2. METHODS.....	7
Study Area.....	7
Sampling Protocol.....	7
Processing, Identification, and Analysis.....	10
3. RESULTS.....	14
Summary of Results.....	14
Foreward to Species Accounts.....	17
Key to the Ants of Louisiana.....	20
Ectioniae.....	21
Ponerinae.....	38
Proceratiinae.....	50
Ectatomminae.....	55
Pseudomyrmecinae.....	63
Myrmecinae.....	71
Dolichoderinae.....	185
Formicinae.....	203
4. DISCUSSION.....	249
LITERATURE CITED.....	263
APPENDIX	
A. ECOREGIONS IN LOUISIANA.....	283
B. PARISHES IN LOUISIANA.....	284
C. LIST OF ANTS IN LOUISIANA.....	285
D. RECORDS OF SPECIES CONSIDERED TO BE PREVIOUSLY UNREPORTED FROM LOUISIANA	288
E. SPECIES OF ANTS THAT ARE LIKELY TO OCCUR IN LOUISIANA	289
VITA.....	290

Abstract

Over three decades have passed since the completion of Moser and Blum's (1960) treatment of the ants of Louisiana. This research represents a significant contribution to and update of their work. I report the first-ever comprehensive assessment of the Louisiana Formicid fauna. More than 100 species from 38 genera and eight subfamilies are covered. This faunistic survey gives valuable data of biodiversity and macro/microhabitat selection of ant species. Included are keys to all subfamilies, genera, and species with illustrations photographs, and a regional map for each species.

Chapter 1

Introduction

This research examines the biodiversity of ants in Louisiana. This project also expands the knowledge base of ants found in the state by providing details on biogeography and observations on natural history. This research is not manipulative but rather observational or measureative. It presents contributions to biology, based on scientific investigations of a diverse family of insects.

One of the most fundamental areas in biology is the study of a species; once one knows what something is the door to understanding it opens. Investigations into taxonomy, phylogenics, behavior, and natural history have been afforded to relatively few taxa. Even with many scientist studying invertebrates, limited research coverage has been accomplished. The limited treatment may be an artifact of the diversity of these groups. For example the class Mammalia has about 4,000 species, and the phylum such as Ctenophora/Cnidaria has about 9,000 species (Wilson 1992), but the family Formicidae (ants) has nearly triple as many species as mammals (LaSalle and Gauld 1993). The limited amount of research on insects is understandable with such a hyper-diverse group, further study is needed. To understand the broader themes in biological research such as ecology, evolution, as well as medical research (pharmaceuticals), the establishment of what an organism is, what it does, and how it is related to other biota is required.

As Sharkey (2001) observed, contrary to popular belief, the oldest profession of humans has been taxonomy. He cites the Bible as stating in Genesis 4:14 God presented to man the duty of naming all the “beasts of the land, all the fish of the sea, and the birds in the sky.” This naming tradition has continued for thousands of years and, in the past 246 years (Linnaeus 1758), has become a well-defined science. However, once a popular part of natural history study,

the field of taxonomy does not have the same number of scientist it once had. For a number of years, the number of up-and-coming taxonomists has diminished rapidly. Nevertheless, a push has been made to rekindle the most basic unit of natural history studies, and in recent years, classical taxonomy and systematic research has begun to reemerge (Wilson 2000) however, the resources to study biodiversity are deteriorating (Edwards 1984). The importance of knowing what species exist and how many occur is one of the most basic questions in biology and leads to many more.

Thoroughly understanding ecosystems has become extremely important as humankind's practices have led to a decline in environmental conditions (Wilson 1998). There is a widely-held idea that mass decline of species diversity causes ecological instability, which directly affects all life on earth (Agosti et al. 2000). Luckily, considerable research is underway to investigate patterns of biodiversity in the context of the ongoing mass extinction (Wilson 1992, Agosti et al. 2000). For some an innate biophilic desire to know what is out there and what is being lost exist (Wilson 1985). One emerging method is that of rapid assessments; these studies take a picture of local diversity. Such studies often produce regional lists that not only aid in further research but also are beneficial to local communities by raising local awareness. Once a common practice in biology, the creation of regional lists for species is not a common practice today yet the need is apparent.

One group receiving attention is the insect order Hymenoptera (ants, bees, wasps, and their kin, LaSalle and Gauld 1993, Agosti et al. 2000). As Gauld is persistent in pointing out, this order is hyper-diverse and this biodiversity is indicated by the lack of a "unifying common name" (LaSalle and Gauld 1993, Gauld and Bolton 1998). In terms of numbers, dominance, and ecological importance, Hymenoptera are fundamentally significant (LaSalle and Gauld 1993).

One family alone within this order can be used to exemplify the importance of insects and biodiversity, the ants (formicidae) (Hölldobler and Wilson 1990, Agosti et al. 2000, LaSalle and Gauld 1993). LaSalle and Gauld (1993) note that ants strongly influence the functionality of ecosystems. Ants dominate by their massive biomass, manipulate species composition, influence trophic interactions, possess numerous mutualistic and symbiotic relationships, and shape both the abiotic (eg: moving soil) and biotic (eg: plant-ant mosaics) matrix of community interactions.

To accurately assess biodiversity and community dynamics, focal taxa require certain criteria. These criteria include: ecological significance, diversity, and ease of collection. In the past, these efforts were focused mostly on birds, vascular plants, and mammals (Johnson 1986, Wilson 2000). A number of recent studies have shifted the focus to include invertebrates such as beetles, butterflies, ants and aquatic macroinvertebrates (Anderson 1997, McCafferty 1981, Olembo 1991, Wilson 2001).

Ants have been recognized as excellent candidate insects for such studies (Agosti 2003). Formicidae contains 21 subfamilies, 358 genera, and more than 11,000 species worldwide (Agosti 2003, Bolton 2003). In North America, there are 10 subfamilies, 70 genera and 983 species. Ants are well suited for studies in taxonomy, biodiversity, community composition, and biogeography (Hölldobler and Wilson 1990, Alonso and Agosti 2000). For example, ants are noted for their proportionally large biomass in ecosystems, making them an important and dominant component of all terrestrial habitats. One area in the Amazon rain forest, ants and termites together weigh more than all land vertebrates combined (Hölldobler and Wilson 1990). Erwin (1989) reported in his canopy studies that 69% of specimens were ants.

Ants also fill numerous niches and often act as “keystone species.” Modifying Solbrig’s (1991) categories of keystone species: predator, mutualist, and resource species, LaSalle and

Gauld (1993) generate support for the contributions in each context for ants. Ants can act as a keystone predator, such as weaver ants (*Oecophylla*). In the category of keystone mutualist, ants are needed by some plants for protection, nutrient recycling, and dispersal of pollen and seeds (myrmecochory, seed dispersal by ants) (LaSalle and Gauld 1993 and references therein). Ants are keystone resource species as well, they influence soil structure by turning earth and transporting organic material into their nest, acting to fertilize soil (Hölldobler and Wilson 1990, LaSalle and Gauld 1993). In addition to being a food resource for other organisms, from other arthropods to mammals (Xenarthra) that specialize in eating ants, ants are associated with numerous organisms, including vertebrates that require them for their survival. Such interaction can be seen in army ants and ant birds which follow the raiding trails of army ants. One other example is the nest location of some neotropical birds that “nest in ant-occupied trees” (LaSalle and Gauld 1993). In addition to high diversity, ants possess a quasi-stable taxonomic and systematic status (Bolton 2003) which creates a situation where identification is assessable and widely understood (Kaspari 2000).

A significant study would be the assessment of biodiversity, community composition, biogeography, and other basic investigation of ecology of a regional biota. Such a study would grant researchers a background from which to begin further more detailed studies. The current research will examine regional ant fauna in Louisiana in a taxonomic and ecological context.

Louisiana is distinctive in the number of diverse communities and unique habitats. The Nature Conservancy lists eight main ecoregions. Some more distinctive habitats are the Tunica Hills ecoregions and southern prairies in the coastal prairie ecoregions. More studies investigating the unique fauna and flora of Louisiana are badly needed (The Nature Conservancy of Louisiana 2004). Louisiana is in a current state of flux with wide-spread logging and

urbanization. Consequently research on biodiversity is paramount and required in a time frame when resident species diversity can still be assessed in Louisiana.

Moser and Blum (1960) generated a list of ants in Louisiana that included a total of 128 potential species for the state. This number requires some amending to reflect taxonomic status and actual occurrence in the state. Sixty four of the 123(after considering synonyms) species were presumed species. They were recorded in adjacent states and were thought to occur in Louisiana. Because of the heterogeneity of habitats in Louisiana and surrounding states, the assumption of species overlap requires reevaluation of those species. In addition, their study only included species and no distributional data. Louisiana's ant diversity not only needs research to clarify previous work, but could yield new species as well. When the Wheelers traveled through St. Tammany Parish, they discovered a species of *Brachymyrmex* not known to occur in the US (Wheeler and Wheeler 1978). They found a small colony of *Brachymyrmex musculus* Forel at a wayside park and cited the likelihood of many introduced species to Louisiana because of the busy port in New Orleans (Wheeler and Wheeler 1978). Moser (pers. com.) noted that at the time the Louisiana list was published, the red imported fire ant (*Solenopsis invicta* Buren) had only infested a few parishes west of East Baton Rouge Parish (about 23 parishes). Callcott and Collins (1996) noted that every parish in the state had been infested by 1975. With the introduction of *S. invicta* and *Linepithema humile* (Mayr), the assumption of community disruption and species displacement would occur is logical. Additionally other eradication methods for these pest ants may have affected species diversity. With this information the need for an updated list becomes clear.

A study that examines the biodiversity of ants in Louisiana is overdue. This research investigates three major research questions: 1) has the species richness changed over time 2) has

the overall species composition changed over time and 3) what are the natural history motifs of the species in Louisiana? The author hypothesizes that: 1) both species composition and species richness have changed dramatically since 1960 (The Moser and Blum 1960 being the only point of reference for Louisiana) and 2) species ecology is the same for states of the southeast. This project had four major objectives:

1. Determine the biodiversity of ants in Louisiana.
2. Determine the biogeography of ants in Louisiana with annotations on macro and microhabitat selection.
3. Provide information regarding to feeding, foraging, mating ecology for the ant species in Louisiana.
4. Generate a guide to on taxonomy, natural history, and distribution for the formicid fauna in the state.

In addition to these notes on species diversity, the generation of maps, a web-based taxonomic key, a web page devoted to pestiferous ant species, and a photo atlas of the ants are provided.

Chapter 2

Methods

Study Area

Louisiana is located in the south central part of the United States (latitude: 29°N to 33°N; longitude: 89°W to 94°W). It is bordered to the west by Texas, to the north by Arkansas, to the east by Mississippi, and the Gulf of Mexico to the south. The land area of Louisiana is 112,835 km² and the state is 611.5 km long and 209.2 km wide. The average elevation above sea level is only 30.5 m the highest point is 163 m (Driskill Mountain) above sea level and the lowest is little over 2 m (New Orleans) below sea level. The climate is considered subtropical. Louisiana has eight bioregions that include the Mississippi river alluvial plain, tunica loess hill, coastal prairie, coastal marsh, southern mixed pin-hardwood forest, east gulf-coastal plain longleaf-pine forest, west gulf-coastal plain longleaf-pine forest and northwestern mixed pine-hardwood forest (Appendix A).

Sampling Protocol

The computation of species diversity in Louisiana involved three phases of investigation: 1) an extensive literature review; 2) visiting museum and regional holding of ants; and 3) field surveys. The literature review included evaluation of ecological and natural history studies conducted in Louisiana and searching for distributional or state records in taxonomic revisions and other regional taxonomic studies. Collections that I visited were Louisiana State Arthropod Museum, Florida State Collection of Arthropods, Mississippi Entomological Museum, and the holdings of the Southern Forest Research Station where the Moser and Blum (portions) collection is held. Survey sites were systematically chosen based on accessibility, location within an ecoregion. Louisiana has little public land. Access to land is limited to wildlife management

areas (WMA), state parks, and national forests. My survey involved selection of WMAs or other public land for each ecoregion in the state. In addition to these sites at least one survey area per parish was attempted. Often interesting habitats recommended by researchers in the state were used for surveyed.

At each selected site, a modification of the ants of leaf litter (ALL) protocol was performed (Agosti 2000). The ALL protocol involves at least three days of sampling, with transects of pitfall traps, sifting events, baits and directed hand collecting. Each sampling event consisted of one intensive sampling period of five or more hours per site occurred from December of 2002 to July 2004. A total of 26 sampling events occurred in the two year study period. Field notes were taken for each sample site with observations on microhabitat themes, major flora types, sample methods, behavior of ants encountered, and microhabitat sites of colonies.

Care was taken to design a sampling methodology that closely follows the ALL protocol. However, the author's protocol does not preclude arboreal sampling. My protocol included a number of sifting (Berlese) samples, sweeping, bait transect samples (sampling both arboreal and ground), and opportunistic collecting. Pitfall traps were in the original protocol but yielded few specimens over a 48-hour sampling period and were abandoned after 22 samples yielded few specimens.

All debris including humus, litter, and the topmost layer of soil was collected by hand and sifted. Larger pieces of the ground cover, such as twigs and logs, were broken and sifted. When I found dead animals, fungi, and other ephemeral microhabitats, that material was sifted as well. All material was placed into a sifter (mesh size 1x1 cm) and sifted into cotton bags (pillow cases) with field labels for a total of nine kg for each site or macrohabitat. This material was

returned to LSU and placed in a Berlese funnel for a period of 24-48 hours to collect all ants found in the litter (the majority of the other taxa were donated to the Louisiana State Arthropod Museum).

To further sample for ants, bait traps, sweeping, arboreal, and directed opportunistic collecting were completed. Bait was placed in ten 20-ml glass scintillation vials with 3-ml of honey in five vials and 4-g of protein material (one quarter slice of Vienna sausage) in five others. Baits were placed three m apart from each other on transect. This was done for 125 samples, then the scintillation vials were later replaced with 12-ml plastic snap cap vials (D. Prowell pers.com.) and short bread with pecan nut cookies (Cover and Fisher pers. com.) replaced honey and sausage baits. The traps remained open for one hour. Vials were then filled with ethanol and a field label. A series of 10 sweep samples were taken where vegetation was higher than 1-m using a BioQuip standard sweep net for 50 sweeps. Vegetative debris was removed, and the remaining material was placed in a four L Ziplock bag and placed in an ice chest then returned to LSU and frozen until processed at a later date or ants were directly aspirated out. If an area had >30 % vegetation higher than three meters in height, a more intensive sampling method for arboreal ants was conducted. Depending on the amount of arboreal habitat, either random or systematic placement of the arboreal bait vials were utilized. If I was in the forest, then a random transect in one direction was selected; then care was taken not to have a transect along a path or roadway. If there were only a few trees or shrubs they had baits placed in them in a systematic fashion of one bait vial per tree for every tree. Ten baits placed at a height of 1.5 meters in the vegetation were left open for one hour. After one hour ethanol was added to the vials with ants. A label with ecological data, especially plant species and collection code was then deposited in the vial with the ants.

Logs, rocks, trees, and other likely places which ants colonize were searched, and ants collected with a 9-dram Rose Entomology aspirator. An effort to collect 10 individuals of each caste and life stage was taken. At the end of sampling, vials were filled with ethanol and a field label added. My sampling was supplemented with specimens from other researchers and from previously conducted studies. Current and on-going projects, and material from Louisiana State Arthropod Museum was also shared with me. Drs. D. Colby, D. Prowell, and L. Hooper-Bùi shared their ant reference collections with me.

Processing, Identification and Analysis

Samples were returned to the Louisiana State University AgCenter Red Imported Fire Ant Laboratory for processing. For each sample, ants were sorted from debris and identified to genus. Sorted specimens were placed in four-dram glass vials with proper labels noting country, state, parish, nearest town locality, GPS coordinates, date, collection method, ecological information and collector. When more than 10 individuals were present, six were removed and mounted and labeled, the rest remained in the vial. For those vials with 10 or fewer specimens, all were mounted and labeled. Before the ants dried, their legs were pushed ventrally and away from the body, and the mandibles of some specimens opened, to facilitate identification; the ants were then point mounted on triangle “points” between procoxa and metacoxa on their right side.

All specimens were identified to species. As familiarity with the species in Louisiana accumulated, specimens were identified to species at the initial sorting step. All specimens were counted either as individuals in vials or as individuals on points. All label information was databased in an Excel file. The lack of a universal template for label information of specimens not collected by the myself created a situation where label data was absent such as parish, collector, date and ecological information. Those data were filled in if the I could find that information and added to the database with a special note.

Identifications were made with the use of numerous taxonomic publications. Basic identification to genus was accomplished with Creighton (1950) and Bolton (1997). Creighton (1950) and later reversionary studies were used for species identifications (Table 1). All specimens were identified to species or at generic rank if species identity could not be made. Specimens which the I was unsure of identification were sent to Kye Hudland at (NSCU), John LaPolla (Rutgers), William MacKay (University of Texas), Lloyd Davis, Phil Ward (UC-Davis) and Mark Deyrup (Archbold Research Center) for verification. Voucher specimens are deposited in the Louisiana State Arthropod Museum (LSAM), and in the LSU Red Imported Fire Ant Formicidae Reference Collection (FAFC) the other half are retained in by myself (STDC) currently held at Louisiana State University.

Table1 Keys used to Identify Ant Species in Louisiana

Genus	Author	
<i>Aphaenogaster</i>	Carroll (1975) & Umphrey (1996)	
<i>Camponotus</i>	Mackay (2003)	
<i>Cardiocondyla</i>	Mackay (1995) & Smith (1944)	
<i>Crematogaster</i>	Johnson (1988)	
<i>Cyphomyrmex</i>	Snelling and Longino (1992)	
<i>Dolichoderus</i>	Johnson (1989)	
<i>Dorymyrmex</i>	Snelling (1995)	
<i>Forelius</i>	Cuezzo (2000)	
<i>Lasius</i>	Wilson (1955)	
<i>Leptothorax</i>	Deyrup and Cover (2004) & Mackay (2000)	
<i>Monomorium</i>	DuBois (1986)	
<i>Neivamyrmex</i>	Watkins (1985)	
<i>Paratrechina</i>	Trager (1984)	
<i>Pheidole</i>	Wilson (2003)	
<i>Ponera</i>	Taylor (1967)	
<i>Proceratium</i>	Brown (1980)	Table continued
<i>Pseudomyrmex</i>	Ward (1985)	
<i>Pyramica</i>	Bolton (2000)	
<i>Solenopsis</i>	Trager (1991) & Thompson and Johnson (1989) &	

A species-by-sample-matrix was created for 119 species and 37 sites. This was done by listing the species collected (minus those only from the literature and were in museums that were not collected after 1960). The samples represent localities where the majority of the methods explained above were used. The odd specimen (picked ants up from a gas station, or off the porch of their house, etc.) that were given to me from friends and colleagues were not used in this analysis. The excel file that was created was saved as a text file and imported into EstimateS version 7.0 (Colwell 2004) where the diversity statistics program was used to generate species accumulation curves. Species accumulation or Mao Tau curves (fig 1) (Colwell 2004) were plotted from EstimateS (Colwell 2004) output generated from a matrix with 37 sampling events (effort) and 119 species. Taken into account only those species collected in this study and not those from museum holdings or from the literature.

Photographs for figures were taken by Michael A. Seymour for the majority of species in Louisiana. All photographs are copyrighted to Michael A. Seymour 2004. The Camera used was a Canon- EOS-D60 digital, with a Canon EF 100mm F/28 Macro lens, with a Canon MT-24EX, macro twin lite flash, other photographs were taken with an Olympus OLY-1=750 analog camera mounted on a Olympus SZX12 stereomicroscope, with Image-Pro plus version 4.0 (Medacybematics.) software. Distributional maps were created for each species. This was accomplished by compiling all the know localities for each species for those localities where no Global Positioning System (GPS) coordinates were recorded, the United States Geological Service geographic names information system website (US Department of the Interior 2004) was used to get GPS coordinates. Each locality was assigned GPS coordinates and then added to the database. Some localities were so ambiguous no points could be assigned and were not used for

distributional analysis. These points were converted from degree, minutes, seconds, to decimal degrees in an Excel worksheet. Distributional data points for each species were assigned decimal degree points. Files were then imported in ArcView 3.3 (ESRI 2002) to create maps. The data was sorted for each species and coordinates were assigned a circle point on the map. All species with labels that had usable localities data were plotted with individual maps.

Chapter 3

Results

Summary of Results

My research examined nearly 130,000 specimens and found 128 species (Table 2) of ants compared to Moser and Blum (1960), who found 59 species (Table 2) and reported 128 (123 after current taxonomical changes are considered). This project increased the known species from 59 (Moser and Blum 1960) to 122 (Appendix C) confirmed 29 presumed species.

Confirmation of presumed species from Moser and Blum (1960) are listed as follows:

Aphaenogaster treatae, *Pheidole metallescens*, *Crematogaster ashmeadi*, *Crematogaster cerasi*, *Crematogaster lineolata*, *Crematogaster pilosa*, *Solenopsis molesta*, *Solenopsis texana*, *Myrmecina americana*, *Temnothorax curvispinosus* = (*Leptothorax curvispinosus*), *Temnothorax pergandei* = (*Leptothorax pergandei*), *Pyramica clypeata*, *Pyramica margaritae*, *Pyramica rostrata*, *Pyramica talpa*, *Proceratium silaceum*, *Cryptopone gilva* = (*Euponera gilva*), *Pachycondyla stigma* = (*Euponera stigma*), *Tapinoma sessile*, *Camponotus caryae*, *Camponotus castaneus*, *Camponotus (Colobopsis) impressus*, *Camponotus (Colobopsis) mississippiensis*, *Camponotus nearticus*, *Paratrechina longicornis*, *Prenolepis imparis*, *Formica pallidefulva*, *Formica schaufussi*. Of the 127 species recorded, 23 were not collected in this two-year study, 13 species were found in museum holding and 10 species were recorded from the literature. Louisiana contains 122 species of the 983 nearctic species, 40 of the 70 nearctic genera and eight of the 10 nearctic subfamilies (Table 3 and 4). Species diversity in Louisiana was similar to that of surrounding states (Table 2) however, composition had limited overlap. Mississippi has 78 species in common with Louisiana. Arkansas has 53 species in common with Louisiana. Texas has 62 species in common with Louisiana. None of the species found in Louisiana were unique

i.e. they also occurred in one or more of southern states. This research presents 24 species previous unreported from Louisiana (Appendix D).

Table 2. Relative biodiversity in Louisiana compared to adjacent states.

State	Subfamilies	Genera	Species
Louisiana ¹	7	34	59
Louisiana ²	8	40	128
Arkansas ³	8	31	88
Mississippi ^{4,5}	8	36	127
Texas ⁶	10	55	210
North America ⁷	10	70	983

¹ Moser and Blum (1960)

² Dash

³ Warren and Rouse (1969)

⁴ Smith (1924-1931)

⁵ MacGown (2004)

⁶ Wheeler and Wheeler (1985)

⁷ compiled from literature

Table 3. Louisiana ant fauna compared with the nearctic ant fauna

Subfamily	Genera		Species	
	Nearctic	Louisiana	Nearctic	Louisiana
Amblyoponinae	2	0	4	0
Ponerinae	8	5	16	8
Ectatomminae	2	1	4	1
Proceratiinae	2	2	8	4
Pseudomyrmecinae	1	1	9	4
Cerapachyiinae	2	0	4	0
Ecitoninae	3	2	29	9
Myrmicinae	30	16	523	67
Dolichoderinae	8	5	31	9
Formicinae	12	7	355	22
Total	70	39	983	122

Table 4 Louisiana ant fauna compared with the nearctic ant fauna

Genus	Species	
	Nearctic	Louisiana
Amblyoponinae		
<i>Amblyopone</i>	3	0
Ponerinae		
<i>Cryptopone</i>	1	1
<i>Hypoponera</i>	4	2
<i>Leptogenys</i>	2	1
<i>Pachycondyla</i>	4	2
<i>Ponera</i>	2	2
Ectatomminae		
<i>Gnamptogenys</i>	2	1
Proceratiinae		
<i>Discothyrea</i>	1	1
<i>Proceratium</i>	6	3
Pseudomyrmecinae		
<i>Pseudomyrmex</i>	9	4
Ecitoninae		
<i>Labidus</i>	1	1
<i>Neivamyrmex</i>	25	8
Myrmicinae		
<i>Atta</i>	2	1
<i>Cyphomyrmex</i>	4	1
<i>Mycetosoritis</i>	1	1
<i>Trachymyrmex</i>	8	2
<i>Crematogaster</i>	30	6
<i>Pyramica</i>	38	15
<i>Strumigenys</i>	5	2
<i>Cardiocondyla</i>	9	3
<i>Leptothorax</i>	70	5
<i>Myrmecina</i>	3	1
<i>Myrmica</i>	75	1
<i>Aphaneogaster</i>	40	6
<i>Pheidole</i>	100	7
<i>Monomorium</i>	16	3
<i>Solenopsis</i>	40	4
<i>Tetramorium</i>	8	1
Dolichoderinae		
<i>Dolichoderus</i>	4	2

2 Table Continued

<i>Dorymyrmex</i>	14	2
<i>Forelius</i>	3	2
<i>Linepithema</i>	2	1
<i>Tapinoma</i>	3	2
Formicinae		
<i>Brachymyrmex</i>	4	3
<i>Paratrechina</i>	17	4
<i>Prenolepsis</i>	1	1
<i>Formica</i>	86	2
<i>Polyergus</i>	4	1
<i>Camponotus</i>	52	10
<i>Lasius</i>	18	1
<hr/> Totals	<hr/> 717	<hr/> 116

For the 122 species there is presented a brief taxonomic diagnosis and distributional map is presented (Appendix B presents a map for Parishes (fig.) in Louisiana). Each species has notes on the macrohabitat characteristics of the area, what ecoregion it is found in, microhabitat information specific sampling areas, and information on what collecting technique yielded the species. Appendix E presents 27 species which are considered likely to be found in Louisiana with further field investigating. Twenty species of exotic ants were found (table 5). A species accumulation curve was generated for the sites sampled and species collected.

Foreward to Species Accounts

Species accounts are presented in the following manner a key to the eight subfamilies of Formicidae in Louisiana is presented. Then each section following this key is divided by subfamily and presented in phylogenetic order. Each subfamily is organized by tribe (based on Bolton 2003, in alphabetical order) for organization of related generic groups within the subfamilies. A key to the genera in each subfamily is presented and the being of each subfamily. Each tribal section includes the genera found in Louisiana.

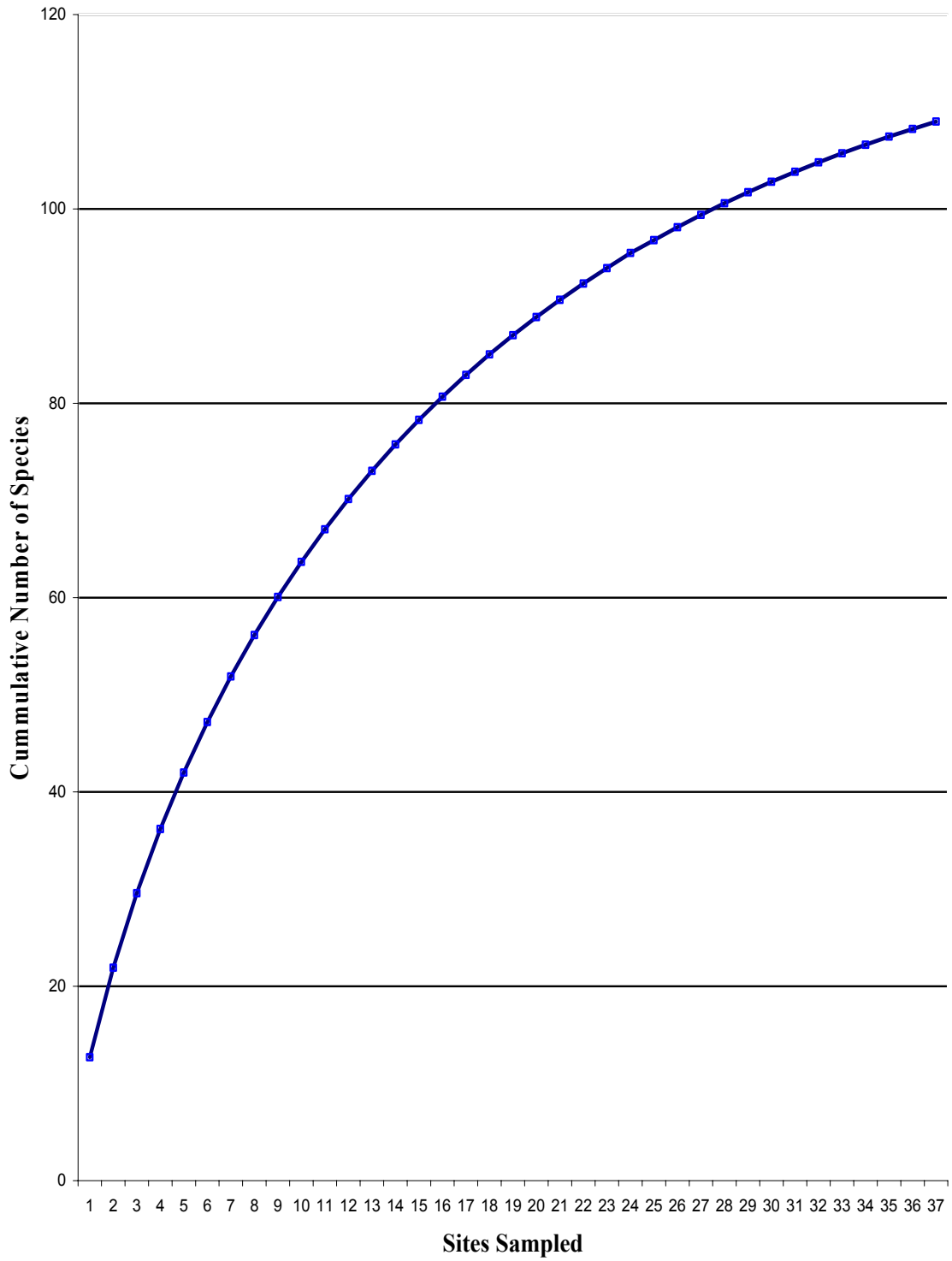


Fig. 1 Species Accumulation Curve

For each genus, a diagnostic description is presented with notes on the general biology and the number of global and nearctic species. Following each Generic Diagnosis and Natural History is a key to the species in Louisiana. For each species a profile is presented that details taxonomic characters, natural history, range, distribution in Louisiana, and label data from specimens (including specimen counts and locations) in addition to comments or papers of relevance.

Label data is presented with only the information found on the label. The organization of those data reflects exactly what appears on the labels. However in order to conserve space both the country (USA) and state (Louisiana) have been left out of this section. Label data is present in alphabetical order by parish. All the label data following a underlined parish belongs to specimens collected in that parish. Each specimen label is separated by a semicolon. If parish data were absent from labels, but could be ascertained those labels were recorded in this section. If not, they were not recorded, but are used in the maps. Each portion of the label is separated by a comma and a count of the specimens from that label series is recorded in parenthesis followed by the location where the specimens are deposited. Each label set is separated by a semicolon.

An acronym for where the specimens are held, that is where they are deposited follow number of species in the label set. Specimens are found in the following collections

CASC California Academy of Science, Golden Gate Park, San Francisco, California,
94118. Dr. W. Pulawski

FAFC Red Imported Fire Ant Laboratory Formicidae Reference Collection, Dept. of
Entomology, Louisiana State University, Baton Rouge LA, 70803. Dr. L. Hooper-
Bùi

- LACM** Los Angeles County Museum of Natural History, 900 Exposition Boulevard, Los Angeles, California 90007 Dr. R. Snelling
- LSAM** Louisiana State Arthropod Museum, Louisiana State University, Baton Rouge LA, 70803. Dr. C. Carlton.
- MEM** Mississippi Entomological Museum, Mississippi State University, Starkville, MS, 39762. Dr. R. Brown
- PCOL** Prowell collection, Dept of Entomology, Louisiana State University, Baton Rouge, LA, 70803. Dr. D. Prowell
- SRSS** Southern Research Station, forest Insect Research, U.S. Department of Agriculture, 2500 Shreveport Hwy, Pineville, LA, 71360. Dr. J. Moser
- STDC** Shawn T. Dash Collection, author's collection currently located at Louisiana State University, Baton Rouge, LA, 70803

Codes using morphometric details on size have been classified based on a system employed by Wheeler and Wheeler (1986). Very small ranges from 2mm or less, small 2-4 mm, medium 4-6 mm, large 6-8 mm and very large is 8mm or greater.

Key to the Ants of Louisiana

Subfamily Key (based Creighton 1950, Wheeler and Wheeler 1990, Bolton 2003).

- 1 Pedicel of two segments (Fig. x1)2
- 1' Pedicel of one segment (Fig x2)..... 4
- 2 Eyes absent or vestigial, frontal carinae short with short clypeus**Ecitoninae**
- 2' Lacking the above combination of characters.....3
- 3 Elongate, slender ants, with large conspicuous eyes; posterior medial margin of clypeus not reaching back between antennal insertions.....**Pseudomyrmecinae**

- 3' Shape variable, but lacking exact combination of above characters; posterior medial margin of clypeus projecting between antennal insertions.....**Myrmicinae**
- 4 With a constriction between the 1st and 2nd gastric segments.....5
- 4' Lacking a constriction between the 1st and 2nd gastric segments.....8
- 5 Body heavily sculptured with grooves. Metapleural gland orifice in profile longitudinal to oblique curved slit, below a rim of cuticle that surrounds the orifice so that it is directed dorsally.....**Ectatomminae**
- 5' Body lacking deep, heavy sculpturing, the metapleural gland orifice not fitting the above description.....7
- 7 Promesonotal suture present.....**Ponerinae**
- 7' Promesonotal suture either absent or poorly development, second gastric segment enlarged terminal segments of gaster produced anteroventrally under the gaster.....**Proceratiinae**
- 8 End of gaster with slit-like opening.....**Dolichoderninae**
- 8' End of gaster with opening encircled with a fringed of hairs (acidopore).....**Formicinae**

Ecitoninae

Key to the Genera of Ecitoninae in Louisiana

Key to Workers (Watkins1985)

- 1 Tarsal claw with a subapical tooth*Labidus coecus* (fig 3)
- 1' Tarsal claw lacking a subapical tooth*Neivamyrmex*

Key to Males (Watkins 1985)

- 1 The subgenital plate with two apical teeth*Labidus coecus* (fig 2)
- 1' The subgenital with two lateral teeth as well as a median tooth*Neivamyrmex*

Ecitionini

Labidus Jurine, 1807

Generic Diagnosis and Natural History Description based on Smith (1947) and Creighton (1950). Polymorphic species whose workers range from small to large. Antenna 12-segmented with a short scape that falls short of the occipital border, often not reaching beyond the eye. The eyes are absent or reduced, frequently not apparent. The mesosoma lacks both promesonotal and mesoepinotal sutures. The propodeum lacks spines. The tarsal claws characterized by a median tooth will separate this genus from *Neivamyrmex* (Smith 1947 Creighton 1950).

Generic Distribution eight total species; one Nearctic species (Watkins 1976).

Species recorded from Louisiana (one)

Labidus coecus (Latreille)

Formica omnivora Oliver, 1791

Formica coeca Latreille, 1802

Labidus latreillii Jurine, 1807

Labidus jurini Shuckard, 1840

Labidus servillei Westwood, 1842

Mutilla (Labidus) fulvescens Blanchard, 1849

Labidus sayi Haldeman, 1852

Labidus atriceps Smith 1859

Labidus pilosus Smith 1859

Eciton vastator Smith, 1860

Eciton erraticum Smith 1860

Myrmica rubra Buckley, 1867

Pseudodictyhadia incerta Andre, 1885

Eciton smithii Dalla Torre, 1892

Eciton coecum var. *biloba* Emery, 1901

Eciton nigrita Emery, 1901

Eciton coecum var. *kulow* Forel, 1901

Eciton selysi Forel, 1904

Eciton gassator Forel, 1911

Eciton (Labidus) coecum servillei var. *hostilis* Santschi, 1920

Eciton (Labidus) coecum var. *opacifrons* Wheeler, 1921

Eciton (Labidus) coecum var. *elsbethae* Forel, 1922

Eciton (Labidus) serpentis Weber, 1938

Species Diagnosis Queen, male and workers are known. Only one species in this genus occurs in the nearctic; *Labidus coecus*. The eyes are vestigial. The workers are polymorphic (2.9-9.7mm) and brown to reddish brown in coloration. The mesosoma is nearly all shiny except the posterior half, which has a dull appearance due to sculpturing (Smith 1947). The ventral surface of the petiole bears a posteriorly projected spine. This species may be confused with *Neivamyrmex pilosus* an examination of the tarsal claws will clear up confusion.

Natural History Semi-temporary nest underground, under stones, rocks, or decaying logs. Colonies are large with thousands of workers (Smith 1947). Cokendolpher and Francke (1990) collected *L. coecus* in moist soil under leaf litter, twigs, and vegetative detritus in Texas. In Louisiana it appears to prefer pine dominated ecosystems such as Longleaf-pine savannas. It has been collected primarily from the northwest mixed-pine hardwood and the west gulf-coastal plain longleaf-pine forest ecoregions as well as once from the east gulf-coastal plain longleaf-pine

forest ecoregion. *Labidus coecus*' diverse proteinaceous diet is thought to include numerous insects and nuts (Smith 1965). Occasional pestiferous habitats (when they invade the house or yard) of *L. coecus* were documented by Smith (1965). Smith also notes that they present little economic importance as a pest and these ants are beneficial as a predator of pest insects. Though subterranean in nature, it occasionally can be found above ground foraging (Creighton 1950). Flight period is from February to May (Watkins 1985).

Range Louisiana, Texas, Oklahoma, Arkansas south to Argentina (Smith 1947).

Distribution in Louisiana Calcasieu, Claiborne, Jackson, Natchitoches, Rapides and St. Tammany (has not been found in a long term project in that area over the past five years) Parishes (fig.). The maps from Watkins (1985) suggest this species may also be in E. Baton Rouge, Lafayette, St. Landry, Rapides, Caddo, Bienville and Lincoln Parishes (fig.).

Label Data CALCASIEU PAR., Sam Houston Jones State Park, 29-IV-1982, blacklight, E. G. Riley, Male (10) LSAM; Houston Jones State Park, 29-IV-1986, blacklight, E. G. Riley, Male (1) LSAM; CLAIBORNE PAR., Homer Ag Exp Sta, 10-V-1982, blacklight, W. Philpot & E. Riley, Male (8) LSAM; JACKSON PAR., School House Springs R1 W T1 7 NNE Sec 12 6 mi Eros, 14-IV-1998, MV/BL, C. B. Barr, Male LSAM (4) LSAM; NATCHITOCHE PAR., Bellwood, X-8-1960, (3) LSAM; Kistachie N. F. Red Drt WMA, 5-6-IV-1985, BL, E. G. Riley, Male LSAM (1); Kistachie Natl. Forest Red Bluff Camp Ground, 15-V-1982, blacklight, E. G. Riley, Male (1) LSAM; Kistachie Nat. For. Kistachie Rang. Dist. Red Dirt Area 1 mi NNE Lotus, Flight intercept Trap, A. R. Cline, Male (1); RAPIDES PAR., Pineville, 11?-13-1964, P. K. Adars (3) LSAM; Glennmora, Ground 3:30 am @ light, 6-I-1962, (8) SFRS; VA Hosp., 28-VI-1962, light trap, SFRS (1); ST. TAMMANY PAR., Abita Springs, VII-10-1960, (3) LSAM.

Neivamyrmex Borgmeier, 1940

Generic Diagnosis and Natural History A polymorphic genus in which workers range from small to large size ants. Antenna 12-segmented with a short scape that falls short of the occipital border, often not reach beyond the eye. Eyes are reduced and frequently not apparent or absent. The mesosoma lacks both promesonotal and mesoepinotal sutures. The tarsal claw is simple, that is, lacking a median tooth as in *Labiatus*.

Generic Distribution 125 total species; 25 nearctic species (Watkins 1976, Watkins 1985).

Key to the Species Watkins (1985).

Workers

- 1 The anteroventral tooth of the petiole with a prominent acute spine directed posteroventrad *Neivamyrmex pilosus* (fig. 9)
- 1' The anteroventral tooth of petiole lacking a prominent acute spine directed posteroventrad.....2
- 2 The basal tooth of the mandible “thumb-like”*Neivamyrmex moseri* (fig. 6)
- 2' The basal tooth of the mandible triangular not projecting from the basal margin in a “thumb-like” fashion.....3
- 3 Head with sculpturing like that of sandpaper..... *Neivamyrmex nigrescens* (fig. 7)
- 3' Head lacking sculptured texture like that of sandpaper.....4
- 4 The node of petiole elongate *Neivamyrmex opacithorax*(fig. 8)
- 4' The node of petiole subquarate (fig.)..... *Neivamyrmex fallax* (fig 4)

Males

- 1 Mandible spatulate.....2
- 1' Mandible sickle shape, however a convex area along the inner margin may exist.....3

- 2 Gaster black to dark brown, ventral surface of petiole with short white setae, a large transverse swelling above the antennal fossa present..... *Neivamyrmex nigrescens*
- 2' Gaster reddish brown, ventral surface of petiole with long golden setae, swelling above antenna absent..... *Neivamyrmex opacithorax*
- 3 Dorsal apical projection of sagitta elongate into a beak-like projection..... *Neivamyrmex melsheimeri* (Fig. 5)
- 3' Dorsal apical projection of sagitta rounded, not elongate into a beak like projection.....4
- 4 Mandible with a convex area along inner margin..... *Neivamyrmex pilosus mexicanus*
- 4' Mandible lacking a convex area along inner margin, distinctly sickle-shaped..... *Neivamyrmex swainsoni* (fig 10)

Species recorded from Louisiana (six)

Neivamyrmex fallax Borgmeier, 1953

Species Diagnosis Description based on Watkins (1985). Only the workers are known; however, *N. swainsoni* and *N. fallax* are suspected to be the same species (MacKay and MacKay 2003). Eyes are poorly developed. The frontal carinae do not form a lamella anterior to the antennae fossa. The head and dorsal surface of the mesosoma is lacking heavy sculpturing; appearing glossy and smooth. The pleural region is coriaceous. “declining face of the propodeum longer than the dorsal face” (Watkins 1985).

Natural History Nests are found in soil (MacKay and MacKay 2003). *Neivamyrmex fallax* has been collected with use of pitfall traps in Louisiana. It has been found in pine woodlands and upland pine savannas in the state. This species can be found in the following ecoregions in Louisiana: northwest mixed pine hardwood forest, and west gulf coastal plain longleaf pine forest.

Range Kansas south to Louisiana, west to Arizona (Watkins 1985).

Distribution in Louisiana Bienville and Natchitoches Parishes maps from Watkins (1985) suggest De Soto, Rapides, and Beauregard Parishes as well (fig.12).

Label Data BIENVILLE PAR., Ringold, 3-Jan-1944, Stamper, (6) LSAM; NATCHITOCHE PAR., Kisatchie Nat. For. Kisatchie Rang. Dist. Red Dirt Area, 19-Sep-2003-28-Apr-2004, pitfall, nr. *Atta texana* nest, mix pine woodland, S. T. Dash, (2) STDC.

Neivamyrmex melsheimeri (Haldeman, 1852)

Labijs melsheimeri Haldeman, 1852

Species Diagnosis Description based on Watkins (1985). Only the males are known. Less than 8 mm in length which is considered to be small for ectonine males. The head forms a rounded corner between lateral ocellus and compound eyes. The distance of the lateral ocellus to the margin of compound eyes less than diameter of median ocellus. Mandibles are sickle shaped. Watkins describes the character state as of the sagitta as “dorsal apical projections of the sagitta elongated, that extend beyond the voval projections.”

Natural History Based on the maps provided by Watkins (1985), this species is found in the west gulf coastal plain longleaf-pine forest and the northwest mixed pine-hardwood forest. No specimens were found during the current study. The males flight period is January to August (Watkins 1985).

Range Southern Oklahoma south to Louisiana west to central Texas (Watkins 1985).

Distribution in Louisiana De Soto maps from Watkins (1985) suggest Rapides, De Soto and Beauregard (fig. 13).

Label Data (Beauregard Par.,) DeRidder, 11-July-1942 Wm. Buren LACM (Snelling and Snelling 2003); Rapides Par., Light trap, Pineville, Spring 1963, J Moser (1).

Neivamyrmex moseri Watkins 1968

Species Diagnosis Queen and workers are known. The follow summation of characters is based Watkins (1968 & 1985). *Neivamyrmex moseri* are small ants, majors 3.10 mm and minors length 1.9 mm, that are a uniform dark red color. Occipital arch of the head punctate however is not density granulate. The mandible of the major with a large basal tooth with three unequal smaller teeth.

Natural History Collected from the excavated nest of *Atta texana*. This nest was located in a pine-dominated habitat in the west gulf coastal plain long leaf pine forest ecoregions. Watkins (1971) collected this species in Texas (Bell Co.) in a rocky field, under a stone.

Range Central Louisiana and eastern Texas (Watkins 1985).

Distribution in Louisiana Rapides Parish (fig.14).

Label Data RAPIDES PAR., 7 mi W. Alexandria, Kisatchie Nat. Forest, 92 36' long. 31 14' lat, April 13-1959 1 ft in the excavated surface subsoil of large nest of *Atta texana*, J. C. Moser (Watkins 1968); Kistachie National forest, 31° 14' N 92°03' W alt 200' 19-Apr-1959, J. C. Moser in *Atta texana* nest (14) STDC/LSAM, (86) SRSS; Int. Paper Co. exron T/NR3WS15 LA John C. Moser in nest of *Atta texana* ½ sand filled f.g. cavity 3' VIII-09-1960 (with a determination label in the vial), *N. fallax* M. R. Smith 1960.

Comments For detailed description see Watkins (1968, 1971). One sample was found in the collection of SRSS that was determined by M. R. Smith as *Neivamyrmex fallax* in 1960, I have reviewed this material and that the specimens are actually *N. moseri*. I believe these specimens are the ones cited in the Waller and Moser (1990) on nest associates.

Neivamyrmex nigrescens (Cresson, 1872)

Labidus nigrescens Cresson 1872

Eciton schmitti Emery, 1894

Species Diagnosis The following description is based on Watkins (1985). The queen, males, and workers are known for this species. The worker is light red brown to dark brown. The eyes are vestigial. The dorsal surface of the head, mesosoma petiole, and postpetiole punctate. The mandible is lacking an angle along the basal margin. Very similar to *N. texanus*, however, the basal face of the propodeum is slightly concave and the basal and the declivous face form a rounded angle. Male: mandible is spatulate. The “distance from the lateral ocellus to the margin of the compound eyes is about equal to the or less then the diameter of the median ocellus” (Watkins 1985). The gaster is dark brown to black in color the ventral surface of the petiole with short white setae.

Natural History Nests are large with thousands of workers (Cole 1940). This species has a nomadic-stary life cycle. The nest can be found under rocks. Smith (1924) thought *N. nigrescens* to be the most common species of *Neivamyrmex* in Mississippi however, data do not support this for Louisiana. This species feeds on the larvae of other ants. In Louisiana it can be found in the west gulf coastal plain longleaf-pine forest, coastal marsh, Mississippi alluvial plain, and coastal prairie. The flight period is mid August to mid November (Watkins 1985).

Range West Virginia south to Georgia west to California (Watkins 1985).

Distribution in Louisiana Acadia, East Baton Rouge, Lafayette, Plaquemines, Rapides and Natchitoches Parishes (fig.). Parishes (fig.). from the maps of Watkins (1985) suggest Orleans, Lafayette, and Beauregard (fig.15).

Label Data ACADIA PAR., Crowley, 31-v-'11, C. E. Hood (Watkins 1972); E. BATON ROUGE PAR., # 74 B. R. , X 1 61, (1) LSAM; Baton Rouge, 17-IX-1915, T. H. Jones (Watkins 1972); Baton Rouge , 18-Oct-1936, C. L. Smith, (2) LSAM; Baton Rouge (1) MEM; LAFAYETTE PAR., Lafayette, 22-VIII-08, E. S. Tucker (Watkins 1972); PLAQUEMINES PAR., Buras , IX-1913, J. R. Horton (Watkins 1972); RAPIDES PAR., Alexandria, 30-VII-08, E. S. Tucker (Watkins 1972); NATCHITOCHE PAR., Kistachie, Flight intercept Trap, A. R. Cline (2)STDC.

Neivamyremex opacithorax (Emery, 1894)

Eciton (Acamatus) californicum opacithorax Emery, 1894

Eciton (Acamatus) opacithorax castaneum Borgmeier, 1939

Species Diagnosis Description based on Watkins (1985) and MacKay and MacKay (2002). The queen, male and worker are known. Worker: 2.2-4.6mm (length) light brown in color. The eyes are vestigial. The basal border of the mandible with a tooth-like or an angular edge. Dorsal portion of the head is shiny, pronotum normally smooth. Petolar node is elongate. Male: the mandibles are spatulate. The “distance of lateral ocellus to eye is at least 2x the diameter of the median ocellus” (Watkins 1985). The gaster is red, the ventral portion of the petiole with long golden hairs. The apex of the stipes without a dorsal projection.

Natural History *Neivamyremex opacithorax* creates large nest (40,000-50,000 workers) (Van Pelt 1958) in logs, under bark, stumps, other decaying wood, and in the soil (Smith 1937, Van Pelt 1958); Smith (1924) found this species under pine bark. At the Welaka Reserve Florida, it was located in longleaf pine habitat (Van Pelt 1958); Van Pelt (1958) found *N. opacithorax* to feed on other ants such as “*Odontomachus*, *Solenopsis molesta*, *Proceratium coceum*,

Brachymyrmex depilis, and *Paratrechina*” in addition to other arthropods. Flight period typically extends from August to December (Watkins 1985).

Range Virginia south to southern Florida west to California North into Kansas and Missouri (Watkins 1985).

Distribution in Louisiana E. Baton Rouge Parish. (fig.16).

Label Data Baton Rouge, 18-Oct-1936, C. L. Smith, (2) LSAM. ST. TAMMANY 2004

Neivamyrmex pauxillus (Wheeler, 1903)

Eciton (Acamatus) pauxillum Wheeler, 1903

Eciton (Neivamyrmex) pauxillum Smith, 1942

Neivamyrmex pauxillus Borgmeir, 1953

Species Diagnosis Description based on Watkins (1985). Only the worker and queen are known. Very similar to *N. moseri* the occipital margin not punctate as in *N. moseri*. The mandible of the major with a medium basal “thumb-like” tooth with four smaller teeth on the mandible. In *N. moseri* a large basal tooth with three unequal teeth on the inner surface of the mandible is present.

Natural History Wheeler (1908) collected this species in western Texas. Cokendolpher and Francke (1990) were unsuccessful in locating this species in their survey of western Texas.

Range Louisiana, Texas, and México.

Distribution in Louisiana Rapides Parish (fig. 17).

Label Data Louisiana, Kisatchie, National Forest nr. Alexandria 13-April-1959, J.C. Moser (2) LACM (Snelling and Snelling 2003).

Neivamyrmex pilosus mexicanus (Smith, 1859)

Labidus mexicanus Smith, 1859

Eciton clavicornis Norton

Eciton (Labiatus) subsulcatum Mayr

Species Diagnosis Queen, males, and workers are known for this species. Worker: a dark brown to black ant. The petiole with a distinct ventral posteriorly directed spine. Males 1.4 cm in total length.

Natural History Smith (1924) found this species uncommonly in Mississippi. It feeds on other ants' brood and larvae, and on one occasion *N. pilosus* workers were found carrying the workers of *Crematogaster ashmeadi*. Smith (1924) relates a story of *N. pilosus* in a well, and the ants decomposed and spoiled the water. This phenomena has occurred several times (Smith 1965).

Range Mississippi west to western Texas not in Arkansas (Watkins 1985).

Distribution in Louisiana Natchitoches and Rapides Parishes (fig.). Parishes (fig.). from the maps of Watkins (1985) suggest East Baton Rouge, St. Landry, Lafayette and Vernon (fig.18).

Label Data NATCHITOCHES PAR., Red Dirt Wildl. Mangt. Press Rd, 04-29-Feb-2000, baited pitfall trap malt and gopher feces, *Geomys bursarius* barrow, A. Tishechkin (3)STDC/LSAM; Kistachie Natl. Forest, Kistachie Bayou Campgrd, 14-VI-1984, Mercury vapor and blk light, C. B. & J. E. Barr (5) *males* LSAM; RAPIDES PAR., Vet. Hosp., VI-27-1962, light trap, L. A. Cambre (2) *males* SRSS.

Neivamyrmex swainsoni (Shuckard, 1840)

Labidus swainsonii Shuckard 1840

Eciton (Acamatus) arizonense Wheeler, 1908

Species Diagnosis Only males are known for this species. However, recent studies suggest that *N. fallax* may be the worker caste of this species (Snelling and Snelling 2003). Male 11-13 mm in length. Mandibles sickle-shaped however, there exists a convex area. Body covered with yellow appressed hairs. The dorsal border of the stipes not triangular and not divided into a dorsal and ventral process. The fore-coxa are longer than wide

Natural History Flight period is mid May to September. Based on the maps by Watkins (1985) this species is found in the Mississippi river alluvial plain and the northwest mixed pine hardwood forest ecoregions.

Range Louisiana west to southern California

Distribution in Louisiana East Baton Rouge and Caddo Parishes (fig.). Parishes (fig.). from the maps of Watkins (1985) suggest De Soto and Ascension (fig. 19).

Label Data Based on Watkins (1985) this species has been collected in the vicinity of Baton Rouge (E. Baton Rouge Par.) and Shreveport (Caddo Parish).



Fig. 2 *Labidus coecus*



Fig. 3 *L. coecus*



Fig. 4 *Neivamyrmex fallax*



Fig. 5 *N. melsheimeri*



Fig. 6 *N. moseri*



Fig. 7 *N. nigrescens*



Fig. 8 *N. opacithorax*



Fig 9 *N. pilosus*



Fig. 10 *N. swainsoni*



Fig. 11 Collection localities for
Labidus coecus



Fig. 12 Collection localities for
Neivamyrmex fallax



Fig. 13 Collection localities for
N. melsheimeri



Fig. 14 Collection localities for
N. moseri



Fig. 15 Collection localities for
N. nigrescens



Fig. 16 Collection localities for
N. opacithorax



Fig. 17 Collection localities for
N. pauxillus



Fig. 18 Collection localities for
N. pilosus



Fig. 19 Collection localities for
N. swainsoni

Ponerinae

Key to the Genera of Ponerinae in Louisiana

Based on Creighton (1950) and Deyrup *et al.* (2003)

- 1 Mandibles completely lacking teeth (fig. 23)..... *Leptogenys elogata*
- 1' Mandibles with teeth with at least a few denticles.....2
- 2 Mandible in side view with a conspicuous pit at its base (fig. 20).....*Cryptopone gilva*
- 2' Mandible without a pit at the base.....3
- 3 Extensor surface of meso- and metatibiae with conspicuous stiff hairs (fig n), relatively large ants.....*Pachycondyla*
- 3' Not having this character state, small ants.....4
- 4 Ventral petiolar process with a fenestra or “porthole”*Ponera*
- 4' Ventral petiolar process without such a “porthole”*Hypoponera*

Ponerini

Cryptopone Emery, 1892

Generic Diagnosis and Natural History Small ants, eyes reduced meso and meta-tibia with two spurs. A shallow, oval pit is presence at the base of the mandible in lateral view.

Superficially resembling *Ponera* which lacks mandibular pits.

Generic Distribution 15 total species (Bolton 1995), three nearctic species (Deyrup *et al.* 2003).

Species Recorded from Louisiana (one)

Cryptopone gilva (Roger, 1863)

Ponera gilva Roger, 1863

Euponera (Trachymesopus) gilva harnedi Smith, 1929

Species Diagnosis Small (3-3.5mm) orange-brown ants which lack surface sculpturing. Antennal scape failing to reach the occipital border (Creighton 1950, Deyrup *et al.* 2003). Legs are stout, tibiae and metatarsi short. The epinotal pleuron with fine punctures (Smith 1934)

Natural History Nests are found in very moist logs, in woody frass, and under bark of pine logs (Smith 1924, Dennis 1938, Cole 1940). Colonies are small about 30 workers (Cole 1940) The workers are sluggish in locomotion (Smith 1934). Haskins (1931) noted that *C. gilva* accepted numerous insect as food in the laboratory (from house flies to pupae of other ant species). Van Pelt (1958) located nest in mesic hummock habitats in the Florida.

Range North Carolina south to Florida, west to Texas (Smith 1979)..

Distribution in Louisiana The label did not specify the parish and city of New Orleans covers a number of Parishes (fig. 33).

Label Data New Orleans, I-30-1944, E. S.Ross, CASC (2).

Comments Haskins (1931) described all aspects of the biology of *C. gilva* from development, nest structure, to sensory perception.

Hypoponera Santschi, 1938

Generic Diagnosis and Natural History Small to medium size ants (nearctic species small) with small eyes that consist only a few ommatitda. Hind leg with only one tibial spur and simple tarsal claws. The only other genus in the Nearctic that may be confused with *Hypoponera* is *Ponera*. *Ponera* however, possess a fenestra on the ventral lateral surface of the petiolar process. (Deyrup *et al.* 2003, Wheeler and Wheeler 1990).

Generic Distribution 132 total species (Bolton 1995), four nearctic species

Key to the Species (2) This key has been modified from Creighton (1950) and Deyrup *et al.* (2003)

- 1 Petiolar node in lateral view subrectangular, with a rounded dorsal surface.....
..... *Hypoponera opacior* (fig. 21)
- 1' Petiolar node in lateral view subtriangular, with a squared-off dorsal surface
..... *Hypoponera opaciceps* (fig. 22)

Species Recorded from Louisiana (two)

Hypoponera opaciceps (Mayr, 1887)

Ponera opaciceps Mayr 1887

Ponera perkinsi Forel 1899

Ponera andrei Emery 1900

Species Diagnosis Small-size ants that are dull brown-black in color. This species can be recognized from the other species in Louisiana by the lack of a rounded petiole. *Hypoponera opaciceps* have a more squared-off dorsal surface to the petiole; the petiole has parallel faces (Deyrup et. al. 2003).

Natural History Small colonies of this species can be found in moist habitats in forested areas. Smith (1937) found this species in a log in the late stages of decay in Mississippi. Van Pelt (1958) found this species in wet flooded areas of the Welaka Reserve in Florida, in such habitats as hydric hammocks, swamps, longleaf-pine flatwoods. Data from this study indicate this species can be found in the following macrohabitats in Louisiana: longleaf-pine savannas, pine-hardwood forests, upland-beech magnolia, oak-dominated forest with palmetto understory, and on occasion in disturbed areas. *Hypoponera opaciceps* is found in the following ecoregions:

Mississippi River alluvial plain, east gulf-coastal plain Longleaf-pine forest and tunica loess hills. It was collected with pitfall traps, baits, and sifting litter.

Range South Carolina to southern Florida west to Arizona (Creighton 1950).

Distribution in Louisiana Assumption, Calcasieu, East Baton Rouge, Orleans, St. Landry, St. Tammany, Tangipahoa, West Feliciana (Fig. 34)

Label Data ASSUMPTION PAR., 31-Aug-1972, pitfall, sugar cane field, Madny Al-Badry (1 LSAM) CALCASIEU PAR., Sam Houston Jones State Park, 30° 19' N 93° 16' W, 11-Jan-2003 A. R. Cline & S. T. Dash (14)LSAM/FAFC/STDC; E. BATON ROUGE PAR., Baker, Rafe Mayer and Hwy 19 site # 25 0900 hr, 30-Aug-2002, ant vial Vienna sausage, J. L. Rosson (7) Baton Rouge, 10-Nov-1960 (1) LSAM; Baton Rouge, 03-Mar-1963 (1) LSAM; ORLEANS PAR., New Orleans, Audubon Zoo, ?-ix-1999, Gorilla Cage, L. M. Hooper-Bui & A. M. Pranschke (2) FAFC; ST. LANDRY PAR., Washington, Thistlewaite WMA, off Rice Rd 11- Jun-2003 sifting leaf litter, Oak dom. Forest w/ palettes understory, S. T. Dash & K. S. O'Brien (4)STDC; ST. TAMMAMY PAR., Abita Springs, Money Hill Golf Course range {date range 23-May-03-Nov-2000} pitfall trap A. M. Pranschke (11)LSAM/FAFC; Abita Creek Flatwoods Pres., 23-May-2000, Pitfall A. M. Pranschke (2) FAFC; TANGIPAHOA PAR., Arcola Sandy Hollow WMA, 09-Sep-2002, Pitfall trap, Longleaf-pine Savanna, K. E. Landry, Plot #5 Trap#1 (1)FAFC; WEST FELICIANA PAR., Feliciana Preserve 30° 47' N 91° 15' W 21-Apr-1999 Mixed Pine Hardwood forest J. L. Fassbender (4)LSAM.

Hypoponera opacior (Forel, 1893)

Ponera trigona var. *opacior* Forel, 1893

Species Diagnosis Elevated petiole strongly narrow and rounded dorsally. Color variable in Louisiana from dull light brown to medium red brown. May be confused with *H. opaciceps*, refer to species diagnosis.

Natural History Found in leaf litter and in decaying logs, it has also been taken in the detritus cavity of *Atta texana*. Smith (1924) found this species inhabiting areas in woodlands where high moisture levels in Mississippi. Cole (1940) found *H. opacior* is found in moist open habitats but not in wet woodlands. It often appears in the same general macrohabitat as *H. opaciceps* but in less moist microhabitats. *Hypoponera opacior* was collected by sifting litter. Smith (1937) found this species under the bark of a pine log in Mississippi. Data from this study indicate this species can be found in the following macrohabitats in Louisiana: loblolly short-leaf pine and upland hardwoods, beech-magnolia-cypress swamp, Longleaf-pine savannah mixed-flatwoods and upland beech-magnolia habitats. *Hypoponera opacior* can be found in the coastal prairie, Mississippi River alluvial plain, southeast mixed pine hardwood forest, west gulf-coastal plain Longleaf-pine forest east gulf-coastal plain Longleaf-pine forest, tunica loess hills.

Range Virginia to southern Florida, west to western Texas (Creighton 1950)

Distribution in Louisiana Calcasieu, Catahoula, East Baton Rouge, East Feliciana, Evangeline, Natchitoches, Rapides, St. Tammany, and West Feliciana Parish. (Fig. 35)

Label Data CALCASIEU PAR., Sam Houston Jones State Park, 30° 19' N 93° 16' W, 11-Jan-2003, Sifting litter, A. R. Cline & S. T. Dash (5); Nr. Moss Bluff Sam Huston Jones State Park, 16-May-2003, sifting polypore fungus log, Hardwood forest, S. T. Dash (4); CATAHOULA PAR., Sicily Island, Sicily Island Hill WMA, 01-May-2003, Sifting leaf litter, loblolly-shortleaf and upland hardwoods, S. T. Dash (1) EAST BATON ROUGE PAR., Baton Rouge, Bluebonnet Swamp, N 30° 22.14' W 91° 06.20' W, 01-Jul-2003, Sifting log, Beech Magnolia upland Cypress

Swamp, S. T. Dash (6); EAST FELICIANA PAR., Port Hudson, Port Hudson St. Comm. Area, 04-Jun-2003, Sifting forest leaf litter, S. T. Dash, Seymour Site 768 (3); EVANGELINE PAR., St. Landry, Chicot State Park, Hiking trail, 27-Jun-2003, Sifting leaf litter and fungus, upland Beech-Magnolia, S. T. Dash (8); NATCHITOCHE PAR., 1 mi NNE Lotus, 31°30' N 93°7.5' W, 12-Apr-2002, Flight Intercept Trap, A. R. Cline (5), Kistachie, 20-Jul-2003, sifting, A. R. Cline (21) RAPIDES PAR., 10 mi SE Flatwoods, 30-Dec-1958, coll in detritus cavt 6' in nest of *Atta texana*, J Moser, (11 SFRS) ST. TAMMANY PAR., Abita Creek Preserve, 30° 31' 25" N 89° 58' 07" W, FIT/MT, Woods, Longleaf Savanna, wet pine flatwoods, D. Prowell (174) PCOL, Open, Longleaf Savanna, wet pine flatwoods, Abita Creek Preserve, 30° 31' 25" N 89° 58' 07" W, FIT/MT, D. Prowell (85) PCOL WEST FELICIANA PAR., Feliciana Preserve 30° 47' N 91° 15' W, 18-Sep-2002, Sifting A. R. Cline & A. Tishechkin (3)

Leptogenys Roger, 1861

Generic Diagnosis and Natural History Medium to large ponerine ants with the middle of the anterior border of the clypeus projecting to an acute point. Mandibles sickle-shaped lacking or nearly lacking teeth (Creighton 1950, Smith 1947). Tarsal claws pectinate. Eyes are large. The reproductive females are similar to workers. Wheeler (1910) noted that the traditional form of queen is “replaced by a gynacoid worker.” Reproductive females can be distinguished by the epinotum being more rounded and the gaster larger (Wheeler 1910). This genus could be confused in Louisiana with species of *Pachycondyla*, however, *Pachycondyla* lacking a clypeal projection and pectinate tarsal claws. In addition, the mandibles are not sickle-shaped and do have teeth and the over all appearance is more robust body. *Leptogenys* exhibits diversity in regards to foraging; some species are lone hunters of isopods where as others work together to search for arthropods (Trager and Johnson 1988).

Generic Distribution 200 total species (Bolton 1995), two nearctic species (Trager and Johnson 1988)

Species Recorded from Louisiana (one)

Leptogenys elongata (Buckley, 1866)

Ponera texana Buckley, 1866

Ponera elongate Buckley, 1866

Lobopelta septentrionalis Mayr, 1866

Species Diagnosis Medium-sized species, light brown to dark brown. Petiole truncate, head and alitrunk shiny to slightly dull. Mandibles with small pits or punctures which is in contrast to the elongate punctures of *Leptogenys manni* an eastern species found in Florida. These two species were once considered the same species but with the character state of the mandible and distinct differences in genitalia of the males (see Trager and Johnson 1988 for a key to the workers and males) they are consider separate species.

Natural History Wheeler (1910) and Smith (1947) believed these ants feed largely on isopods, and their detritus piles have isopod remains in them (Trager and Johnson 1988). The distinctive morphological modification of the clypeus is thought to aid in their transport (Wheeler 1904, Smith 1947). Colonies are small and found in soil of mixed forests of the southeast (Deyrup *et al.* 2003). This species can be found when foraging or can be located under rocks or logs. Mating flights occur in May, June, and October (Trager and Johnson 1988). *Leptogenys elongata* inhabits such habitats as mixed-pine forest and longleaf-pine savanna in the east gulf-coastal plain Longleaf-pine forest and coastal prairie ecoregions in Louisiana. I collected this species while it was foraging on a dirt roadway at dusk.

Range South east Texas, northeastern Mexico and western Louisiana never reaching east of Mississippi River (Trager and Johnson 1988).

Distribution in Louisiana Calcasieu, Natchitoches and Rapides (Fig. 36)

Label Data CALCASIEU PAR., N Moss Bluff Sam Houston Jones State Park, 09-Mar—16-May-2003, FIT # 2, A. R. Cline (4)STDC; NATCHITOCHEs PAR., Kistachie, Kistachie Nat. For., Red Dirt Area, 19-Sep-2003, by hand on road way, S. T. Dash. (2) STDC/LSAM ; RAPIDES PAR., Pineville, 27-Jan-1967, under rock, J C Moser (7) SRSS.

Pachycondyla Smith, 1858

Generic Diagnosis and Natural History Historically a troubled genus, experts feel that a number of genera need to be synonymized into this genus. Species in this genus are medium to large size ants, which lack discreet diagnostic characters (Deyrup *et al.* 2003, Smith 1947). Nevertheless, this genus can be separated from other similar appearing genera in Louisiana by its large size, the presence of mandibular teeth (lacking in *Leptogenys* and *Gnamptogenys*) and dorsal sutures, in addition to the petiole is narrowly attached to the gaster. The diagnostic characters are unclear and indistinct but this is not a huge concern with the limited diversity in the state.

Generic Distribution >198 total species (Bolton 1995); four nearctic species (Deyrup *et al.* 2003);

Key to the Species base on Deyrup *et. al.* (2003)

1 Large species (7mm) *Pachycondyla harpax* (fig 24)

1' Small to medium-sized species (3mm)..... *Pachycondyla stigma* (fig 25)

Species Recorded from Louisiana (two)

Pachycondyla harpax (Fabricius, 1804)

Formica harpax Fabricius, 1804

Pachycondyla montexumia Smith, 1858

Pachycondyla orizabana Norton, 1868

Pachycondyla harpax var. *dibullana* Forel 1901

Pachycondyla harpx var. *irina* Wheeler 1925

Pachycondyla harpax var. *concinna* Wheeler 1925

Species Diagnosis Large, dark colored ants. This species can be differentiated from the other species of ponerine ants in Louisiana by its large size (at 6.8 mm, it is the largest ant in Louisiana) and striae on the head (Deyrup *et al.* 2003).

Natural History Fast moving hunters, I have observed them foraging on logs during the day and at night investigating cracks and crevices of bark and along the ground. Their nests are found in a variety of habitats, such as under logs, bark, rocks, and cow dung (Mitchell and Pierce 1912). Colonies are small and can contain nearly 150 individuals (Smith 1979). Data from this study indicate this species can be found in the following habitats in Louisiana: mixed pine-hardwood forest and pine-dominated forest, in the west gulf-coastal plain longleaf pine forest, coastal prairie and tunica loess hill ecoregions.

Range Widespread (pantropic) found in Texas and Louisiana (Smith 1947).

Distribution in Louisiana Calcasieu, Iberville, Jefferson, Lafourche, Rapides and West Feliciana Parishes (fig.). (Fig.37).

Label Data CALCASIEU PAR., N. Moss Bluff, Sam Houston Jones State Park, 9-Mar-16-May-2003, FIT #2, A. R. Cline, (4)STDC/LSAM; Sam Houston Jones State Park, 19-Aug-1999, W. MacKay, (2) MEM; IBERVILLE PAR., Glenmore, 10-Apr-1962, 75° F on bush T Wells (1); SRSS; JEFFERSON PAR., Westwage, 20-Aug-1989, W. MacKay, (1) MEM; LAFOURCHE PAR.,

Lockport , Hunting Lease, 2002, M. Richard, by hand (1)FAFC; NATCHITOCHE PAR. Kistachie Nat. For, Red Dirt Area, RD35, 03-Aug-2004, open forest, by hand S. T. Dash (3) STDC; RAPIDES PAR., Pineville w/ D. terebrans & S sapscalligraphus larval, Loblolly Pine, L. S. Pickard, (2) SFRS; WEST. FELICIANA PAR., Elm Park, 25-Mar-1967, Joan Chapin (3) LSAM; (NATCHITOCHE PAR.,) Kistachie, 18-Nov-1958, J. C. Moser (15) SRSS.

Pachycondyla stigma (Fabricius, 1804)

Formica stigma Fabricius, 1804

Ponera quadridentata Smith, 1859

Ponera americana Mayr, 1862

Euponera (Trachymesopus) nixonii Donisthorpe, 1947

Euponera (Trachymesopus) brunneus Donisthorpe, 1947

Euponera (Trachymesopus) sexdentatus Donisthorpe, 1949

Species Diagnosis A medium-sized ant. However, *P. stigma* is smaller than *P. harpax*. The mesosomal sutures indistinct. the mesopleuron finely striate and the propodeum not strongly depressed (Deyrup per. com.).

Natural History Specimen from Louisiana was found from a litter sifting sample that was taken in a mixed hardwood forest in the tunica loess hills ecoregion.

Range Widely distributed in the tropics, in the nearctic found only in Florida.

Distribution in Louisiana West Feliciana Parish (fig. 38).

Label Data W. FELICIANA PAR., N. St. Francisville, Tunica Hills WMA, 31-Jul-1999, sifting litter, Upland Hardwood, J. L. Johnson & T. D. Fassbender (2) LSAM.

Ponera Latreille, 1804

Generic Diagnosis and Natural History Small, dull colored ants that are subterranean.

This genus may be confused with species of *Hypoponera* in Louisiana. The two can be easily separated by the presence of a fenestra on the ventral petiolar process which is present in the *Ponera* and absent in the *Hyperpoera*. Small colonies are found in the soil or under logs and in rotten wood (Smith 1979).

Generic Distribution 31 total species; two nearctic species (Taylor 1967).

Key to the Species base on Taylor (1967)

1 Antennal club distinct, red-brown in color Head width (HW) less than .40mm (avg .35mm)

..... *Ponera exotica* (fig. 26)

1' Antennal club not distinct, dark brown to black HW .50mm—.36mm

..... *Ponera pennsylvanica* (fig. 27)

Species Recorded from Louisiana (two)

Ponera exotica Smith, 1962

Species Diagnosis Easily distinguished from the only other nearctic species of ponerine ants by its smaller size (2 mm) and reddish color. In addition to these characters, a distinct three-segmented antennal club is present and is larger than it is in *P. pennsylvanica* (Smith 1967)

Natural History This species is considered by some to be exotic because it shares a number of characters with Indo-Australian species (Taylor 1967), Smith (1962) felt this species was introduced by the US Armed Services. However, Johnson (1987) considers *P. exotica* to be native based on its existence in undisturbed habitats. In South Carolina, it is distributed in both the piedmont and coastal plain regions that are dominated by hardwood species (Smith 1962). It is best collected by sifting and Berlese. MacKay and Anderson (1991) state that this species can be collected in large numbers with such methods; I however, has not been successful in

collecting a large series of this species. It has been collected from upland hardwood forest and mixed pine upland hardwood forest. It can be found in the following ecoregions: west gulf-coastal plain, Mississippi River alluvial plain and tunica loess hills.

Range North Carolina south to Florida west to Oklahoma and Texas (MacKay and Anderson 1991).

Distribution in Louisiana Catahoula, Natchitoches and West Feliciana Parishes (fig.). (fig 39).

Label Data CATAHOULA PAR., Sicily Island, Sicily Island Hill WMA, 1-May-2003, Sifting leaf litter, Berlese set 2, Loblolly short leaf pine and upland hardwoods, S. T. Dash (4)STDC; NATCHITOCHEs PAR., Kistachie National Forest, Red Bluff Camp (MacKay and Anderson 1991); W. FELICIANA., St. Francisville, Tunica Hills WMA, 31-Jul-1999, sifting litter, Upland Hardwood, J. L. Johnson & D. Fassbender (3)LSAM.

Ponera pennsylvanica Buckley, 1866

Species Diagnosis *P. pennsylvanica* is dark brown unlike *P. exotica* (which is reddish). *Ponera pennsylvanica* has a slightly smaller antennal club than *P. exotica* which is more pronounced. Overall this species appears most similar to those of *Hypoponera*, but *Hypoponera* lacks a fenestra on the ventral petiolar process.

Natural History Found mostly in mesic habitats such as deciduous-dominated forest. Nest often located in decaying logs, leaf litter, moist soil, and under bark (Dennis 1938, Cole 1940). Abundant in the eastern deciduous forest with a number of records in the west (Smith 1979, MacKay and Anderson 1991). Data from this study indicates this species can be found in beech-magnolia upland forest, upland-cypress swamps, Longleaf-pine savannas, bottomland mixed hardwood and mixed pine-hardwood forest. This species has been collected from such

microhabitats as leaf litter and in decaying logs in Louisiana. It has not been collected in high numbers and its collection is sporadic, but searching under bark and sifting leaf litter and decaying logs will provide the best results.

Range South from Nova Scotia to northern Florida, west to portions of Utah (MacKay and Anderson 1991, Taylor 1967).

Distribution in Louisiana Bienville, Calcasieu, East Baton Rouge Parishes, East Feliciana Pointe Coupee, St. Tammany, and West Feliciana (fig. 40).

Label Data CALCASIEU PAR., Sam Houston Jones State Park 30° 19' N 93° 16' W, 11-Jan-2003, Sifting litter, A. R. Cline & S. T. Dash (2)STDC; EAST BATON ROUGE PAR., Baton Rouge, Bluebonnet Swamp 30° 22.14' N 91° 6.30' W, 01-Jul-2003, Sifting log, Beech-Magnolia upland cypress swamp, S. T. Dash (2) LSAM/FAFC.

Proceratiinae

Key to genera of Proceratinae in Louisiana

- 1 Antennal club distinct with the terminal segment greatly enlarged and “football” shaped (fig n).....*Discothyrea testacea* (fig. 28)
- 1' Antennae with a less distinct club, the terminal segment is not greatly enlarged....*Proceratium*

Proceratiini

Discothyrea Roger, 1863

Generic Diagnosis and Natural History Description based on Deyrup *et al.* (2003). A mostly tropical genus of small cryptic ants. Antenna are 12-segmented with a apical club, the terminal segments are enlarged and football-shaped or hypertrophied. Eyes are extremely reduced. The mesosoma lacks dorsal sutures. The second gastric segment is enlarged and comprising a large portion of the gaster. This morphological condition permits the terminal

segments to be produced anteroventrally under the gaster. This genus is similar to *Proceratium*; however, *Proceratium* lacks an apical antennal club (see *Proceratium* for generic characters).

Generic Distribution 27 species global (Bolton 1995); one nearctic species (Smith 1979).

Species Recorded from Louisiana (one)

Discothyrea testacea Roger, 1863

Species Diagnosis This small cryptic ant is unlikely to be confused with any other species, generic characters will separate this species from all others in Louisiana.

Natural History Specimens were found in leaf litter of upland-hardwood forest and mixed-hardwood and pine forest woodland. *Discothyrea testacea* has been found in the northwest mixed pine-hardwood forest and the tunica loess hills ecoregions.

Range North Carolina south to Florida and west to Oklahoma (Smith 1979).

Distribution in Louisiana Sabine and West Feliciana Parishes (fig.). (fig 41).

Label Data SABINE PAR., Zwolle N. Toledo Bend St. Park off LA 3229_17-Jun-2003, sifting leaf litter, S. T. Dash, (1) STDC; W. FELICIANA PAR., N. St. Francisville, Tunica Hills WMA, 31-Jul-1999, sifting litter, Upland Hardwood, J. L. Johnson & T. D. Fassbender (2) LSAM.

Proceratium Roger, 1863

Generic Diagnosis and Natural History Description based on Brown (1979). Small subterranean ants with reduced eyes and antenna consisting of 12 segments without a defined club. This genus can be recognized by the lack of mesosomal dorsal sutures and an unusual gastric arrangement. The second gastric segment is enlarged composing a large portion of the gaster. This condition allows for the terminal segments to be produced anteroventrally under the

gaster. This genus is unlikely to be confused with any other genera in Louisiana except *Discothyrea*. Both *Proceratium* and *Discothyrea* share the unusual gastric arrangements described above, however, *Discothyrea* has an antennal club with the terminal segment being enlarged hypertrophied (Smith 1947, Deyrup *et al.* 2003). The species are hypogaeic, found in moist wood in advanced stages of decay as high moisture content of nesting substrate is required. The species of this genus feed exclusively on eggs of arthropods especially those of spiders (Brown 1979). The “odd” morphology of the gaster is used to hold the eggs toward the mandibles for transport (Brown 1979). In reviewing the literature, species in this genus do not appear to be common. Nevertheless, as others have discussed this may be an artifact of sampling bias (Cole 1958, Brown 1979).

Generic Distribution 29 total species (Bolton 1995), six nearctic species (Smith 1979).

Key to the Species based on Brown (1979) and Deyrup (2003).

- 1 In lateral view petiole not erect and elevated..... *Proceratium pergandei* (fig. 30)
- 1' In lateral view petiole elevated and erect.....2
- 2 The mesosoma with indentation near the junction of the mesothorax and propodeum
..... *Proceratium croceum* (fig. 29)
- 2' Mesosoma with out such indentation..... *Proceratium silaceum* (fig. 31)

Species Recorded from Louisiana

Proceratium croceum Roger, 1860

Ponera crocea Roger, 1860

Species Diagnosis Description based on Brown (1979). Petiole elongated dorsally, rectangular in shape, that is base is nearly equal in width as the apex. Mesosoma with concavity near propodeum.

Natural History Smith (1928) found dealate females in woodland in Mississippi, one specimen was found under the bark of a pine log. Van Pelt (1958) located a number of colonies in pine logs in late stages of decay. Cole (1940) found *P. croceum* in a moist log in mixed hardwoods. This species has been found in moist longleaf pine savannahs in Louisiana in the east gulf coastal-plain ecoregion.

Range Virginia south to Florida west to Texas and Illinois (Smith 1979).

Distribution in Louisiana St. Tammany Parish (fig. 42).

Label Data ST. TAMMANY PAR., Abita Creek Preserve, {1997-2002} 30° 31' 25" N 89° 58' 07" W, FIT/MT, Open, Longleaf Savanna, wet pine flat woods, D. Prowell PCOL (1); Lake Ramsay Preserve WMA, 30° 31' N 90° 10' W, FIT, Longleaf Pine Savannah, D Colby PCOL (2).

Proceratium pergandei Emery, 1895

Sysphincta pergandei Emery, 1865

Species Diagnosis Small, dark-colored ants. The petiole is not elevated, it is low and rounded in appearance (Brown 1979). Scape falling short of the occipital border. The second gastric tergite not prolonged posteriorly (Deyrup et. al. 2003).

Natural History Smith (1924) considered this species to be rare in Mississippi. Brown (1979) observed *P. gergandei* feeding on, as well as storing spider eggs in Mississippi.

Proceratium pergandei inhabits forested areas where it nest in the soil and under rocks (Brown 1979). This species is found by sifting litter and by flight intercept traps in the following macrohabitats in Louisiana mixed hardwood pine forest and longleaf pine-savanna, wet pine flatwoods. *Proceratium pergandei* has been found in both the east gulf coastal-plain longleaf-pine forest, and tunica loess hills ecoregions.

Range Massachusetts south to Florida west to Louisiana and Iowa (Smith 1979).

Distribution in Louisiana East Feliciana, St. Tammany, and West Feliciana Parish (fig. 43).

Label Data E. FELICIANA PAR., S. Clinton, Idlewild Research, Farm, 18-Jun-2003, sifting log, S. T. Dash, (1)STDC; ST. TAMMANY PAR., Abita Creek Preserve 30° 31' 25" N 89° 58' 07" W, FIT/MT, Woods, Longleaf pine savanna, wet pine flatwoods, D. Prowell (5) PCOL; W. FELICIANA PAR., Feliciana Preserve, 30°47' N 91° 15' W, 21-Apr-1999, Sifting litter/berlese, Mixed pine hardwood forest, J. L. Fassbender (5) STDC/LSAM.

Proceratium silaceum Roger, 1863

Proceratium crassicorne Emery, 1895

Proceratium crassicorne var *ves* Emery, 1895

Proceratium silaceum rugulosum Wheeler, 1915

Species Diagnosis Description base on Brown (1979). Petiole is elevated and elongated vertically with parallel faces. The petiole base and the petiolar apex of unequal widths. The mesosoma evenly convex. Similar to *P. croceum* however, this species has the mesosoma with an indentation on the dorsal surface when viewed in profile. Gastric segment two with few hairs or punctures.

Natural History Habits similar to *P. gergandei* both of these species have been found in mixed hardwood-pine forest and longleaf-pine savanna, wet pine flatwoods in Louisiana.

Proceratium silaceum has been found in the east gulf-coastal plain longleaf-pine forest and tunica loess hills ecoregions. Cole (1938) found colonies in logs and stumps that were in advance stages of decay in shady woodlands in Tennessee. Kennedy (1939) synthesizes the pattern of microhabitat selection as in logs that are “not only well decayed but they must live in a place

where moisture is plentiful and consistently maintained.” Though this species feed exclusively on eggs, Brown (1979) was able to get two workers to feed on egg yolk.

Range Ontario south to Florida west to Oklahoma and Illinois (Smith 1979).

Distribution in Louisiana St. Tammany and West Feliciana Parish (fig. 44).

Label Data ST. TAMMANY PAR., Abita Creek Preserve, 30° 31' 25" N 89° 58' 07" W, FIT/MT, Woods, Longleaf Savanna, wet pine flatwoods, D. Prowell (2) PCOL; W. FELICIANA PAR., Feliciana Preserve, 30°47' N 91° 15' W, 18-Sep-2002, Sifting leaf litter, A. R. Cline & A. Tishechkin (1)STDC.

Ectatomminae

Key to the Ectatomminae of in Louisiana *Gnamptogenys*

Ectatommini

***Gnamptogenys* Roger, 1863**

Generic Diagnosis and Natural History Medium sized ants with conspicuous grooved sculpturing over the entire body. Twelve-segmented antenna with prominent eyes. Mandibles elongate and lacking denticles. This genus is unlikely to be confused with any other in Louisiana because of its body sculpturing.

Generic Distribution 102 total species (Bolton 1995), two nearctic species (Smith 1979).

Species Recorded from Louisiana (one)

***Gnamptogenys hartmanni* (Wheeler, 1915) (fig.32)**

Ectatomma (Parectatomma) hartmanni Wheeler, 1915

Species Diagnosis A light red-brown medium sized ant. The propodeum is lacking spines, and the entire body is heavily sculptured with grooves. No other ant species in Louisiana shares these characters.

Natural History Little information is available about this ant. This species is predatory. Echols (1964) found *G. hartmanni* in Louisiana (on four separate occasions) within a nest of *Trachymyrmex septentrionalis*. Each occasion it was encountered, nearly all workers of *T. septentrionalis* were killed. Other *T. septentrionalis* nests in the area were absent of workers and brood and their fungus gardens were failing. Echols (1964) found it to feed on brood of *T. septentrionalis*. It is hypothesized that *G. hartmanni* may also feed on other attines such as on *Atta texana* because they did so in the laboratory (Echols 1964) MacKay and Vinson (1989) found one specimen in Brazos County Texas 10 km west of Kurten, in an open pasture with a number of oak trees nearby. Cook (2003) found it at Camp Swift, Bastrop County, Texas he noted that it is only also been found in Brazo (from MacKay) and Walker (Wheeler) counties in Texas. MacKay and Vinson (1989) suggests Wheeler's theory that this species is introduced, may need to be modified based on MacKay and Vinson's discovery of the species in Texas and the studies by Echols in Louisiana

Range (Few records exist) Northwestern Louisiana, Texas and Honduras.

Distribution in Louisiana Bienville Parish (fig.45).

Label Data BIENVILLE PAR., Lucky ex. Fungus gardens, 29-Apr-1963, Fungus garden of T. sept. full no lv. Trachy 10 work, Ecatoma 10 wok, H. Echols (15) SFSS.



Fig. 20 *Cryptopone gilva*



Fig. 21 *Hypoponera opacior*



Fig. 22 *Hypoponera opaciceps*



Fig. 23 *Leptogenys elongata*



Fig. 24 *Pachycondyla harpax*



Fig. 25 *Pachycondyla stigma*



Fig. 26 *Ponera exotica*



Fig. 27 *Ponera pennsylvanica*



Fig. 28 *Discothyrea testacea*



Fig. 29 *Proceratium croceum*



Fig. 30 *Proceratium pregandei*



Fig. 31 *Proceratium silaceum*



Fig. 32 *Gnamptogenys hartmanni*



Fig. 33 Collection localities for
Cryptopone gilva



Fig. 34 Collection localities for
Hypoponera opacior



Fig. 35 Collection localities for
Hypoponera opaciceps



Fig. 36 Collection localities for
Leptogenys elongata



Fig. 37 Collection localities for
Pachycondyla harpax



Fig. 38 Collection localities for
Pachycondyla stigma



Fig. 39 Collection localities for
Ponera exotica



Fig. 40 Collection localities for
Ponera pennsylvanica



Fig. 41 Collection localities for
Discothyrea testacea



Fig. 42 Collection localities for
Proceratium croceum



Fig. 43 Collection localities for
Proceratium pregandei



Fig. 44 Collection localities for
Proceratium silaceum



Fig. 45 Collection localities for
Gnampogenys hartmanni

Pseudomyrmecinae

Key to Pseudomyrmecinae in the Nearctic region *Pseudomyrmex*

Pseudomyrmecini

Pseudomyrmex Lund, 1831

Generic Diagnosis and Natural History Small to large sized ants. Body is elongate and slender. The antennae are 12-segmented with the scapes usually short never reaching the occipital border of the head (Smith 1949). Eyes are large and extremely obvious, ocelli present. The frontal carinae are very narrow and they do not conceal the antenna insertions. Thoracic sutures present (Smith 1949, Creighton 1950). Species of this genus nest in hollow plant cavities such as grass, plant stems, acacia tree, and twigs (Smith 1979). *Pseudomyrmex* historically has been burdened with taxonomic confusion; the identification of species is dependent on morphometric diagnosis in order to combat further uncertainties (Ward 1985). Superficially, some species resemble wingless wasps, with large eyes and stout antennae. When viewing species in the field they perpetuate this wasp resemblance with their locomotion and antennation

Generic Distribution 130 total species; nine nearctic species (Ward 1985)

Key to the Species modified from Ward (1985). I suggest using Ward (1985) for the nearctic species and to confirm identifications especially in regards to *P. pallidus* and *P. seminole*.

- 1 Large, bicolored species (black and orange)..... *Pseudomyrmex gracilis* (fig. 47)
- 1'Small and unicolored.....2
- 2 Brown in color..... *Pseudomyrmex ejectus* (fig 46)
- 2'Dark yellow in color.....3
- 3 The anterior border of the clypeus straight..... *Pseudomyrmex pallidus* (fig 48)
- 3'The anterior border of the clypeus appearing tridentate..... *Pseudomyrmex seminole*

Species recorded from Louisiana (four)

Pseudomyrmex ejectus F. Smith, 1858

Pseudomyrma ejecta F. Smith, 1858

Pseudomyrma brunnea Wheeler 1908 (nec. F. Smith)

Species Diagnosis Small dark-colored ants. Head rounded and wide, metanotal groove broad and deep. The head is sub-opaque and vertex has a diminished degree of sculpturing. The post-petiole and gaster moderately shiny. Erect pilosity very sparse (based on Ward 1985). The only completely dark species in Louisiana.

Natural History Nests in numerous species of plants such as hickory, oak, and sumac (Ward 1985). This study found *P. ejectus* in the following macrohabitats, beech, magnolia-cypress swamps and longleaf pine savanna-wet pine flatwoods. This species has been collected in the following ecoregions in the state: east gulf coastal-plain longleaf-pine forest, southeast mixed pine hardwood forest, and the Mississippi river alluvial plain. *Pseudomyrmex ejectus* can be collected by sweeping or beating vegetation and has been collected with flight intercept traps.

Range Southern Maryland south to Florida west to western Texas (Ward 1985).

Distribution in Louisiana Beauregard, East Baton Rouge, Evangeline, and St. Tammany Parishes (fig. 49) .

Label Data BEAUREGARD PAR., De Ridder, W. Buren (Ward 1985); E. BATON ROUGE PAR., Baton Rouge, Bluebonnet Swamp, 4-Apr-2004, Beat sheet, A. R. Cline (9) LSAM/STDC; EVANGELINE PAR., species was observed at Chicot State Park, 28-May-2004 S.T. Dash, but no specimens were collected ST. TAMMANY PAR., Abita Springs, Money Hill golf course, 5-May-2000, Sticky trap, A. M. Pranschke LSAM (1) FAFC; Mandeville, Fontainebleau St. Park, 20-Mar-2003, Sweeping *S. sebifera* +shrubs, S. T. Dash (47) STDC/LSAM/FAFC.

Comments Refer to Ward (1985) for a complete description of the species' morphology and host plants along with notes on distribution.

Pseudomyrmex gracilis (Fabricius, 1804)

Formica gracilis Fabricius, 1804

Species Diagnosis A large bicolored species with a black and orange color pattern; the head and gaster are mostly black, the alitrunk, petiole, and postpetiole mostly orange with restricted black areas. This species should not be confused with any other ant in Louisiana, because of its colorful appearance and size. As aforementioned, this species is very wasp-like in locomotion

Natural History Nests in cavities or in dead plants of numerous species. Introduced into Florida, where it was first collected in 1960 (Ward 1985). In Louisiana, it was been collected from beech-magnolia cypress swamps, hardwood forest and in urban ecosystems. *Pseudomyrmex gracilis* can be found in the costal marsh, southeast mixed pine, hardwood and west gulf coastal plain longleaf pine forests ecoregions. This species can be collected by sweeping or beating vegetation and has been collected with use of flight intercept traps.

Range Florida to west Texas.

Distribution in Louisiana E. Baton Rouge, Jefferson Davis, Orleans, Rapides, and St. Martin Parishes (fig.). (fig.50).

Label Data EAST BATON ROUGE PAR., Baton Rouge, Bluebonnet Swamp, 04-Apr-2004, Beat sheet, A. R. Cline (1)STDC; Baton Rouge, Bluebonnet Swamp, 11-Oct-2003, sweeping, M. A. Seymour (1)LSAM; Baton Rouge, Villages Complex, 02-Sep-2003, on car by hand, K. N. Prejean (1)FAFC; Baton Rouge, Burden Research Station, 12-Mar-2004, Sweeping shrubs at woodland edge, S. T. Dash (4)STDC; JEFFERSON DAVIS PAR., Jennings in house, 13-Jun-1997,

A. Deville, (2)LSAM; Jennings, 20-Mar-1998, Allen Deville, (1) LSAM; RAPIDES PAR., Pineville, Southwestern forest research station, 21-Jul-2004 on car, S. T. Dash (1)STDC; ST. MARTIN PAR., Lake Martin, Nr. Cypress II Pres, 12-Jul-2000, hand coll, A. M. Pranschke (1)FAFC.

Comments I was unable to collect specimens from the Audubon Zoo in New Orleans (Orleans Parish) nevertheless, he observed the species there. Refer to Ward (1985) for a complete description of the species' morphology and host plants along with notes on Nearctic distributions.

Pseudomyrmex pallidus F. Smith, 1855

Pseudomyrmex pallida F. Smith, 1855

Pseudomyrmex flavidula Wheeler, 1905 (nec. F. Smith 1855)

Species Diagnosis Description based on Ward (1985). Medium size orange-brown species with lateral areas of fuscous coloration on the gaster. Head is broad, clypeal margin is flat. The metanotal suture is shallow. The base of the propodeum longer than the declivitous face. Erect pilosity is sparse.

Natural History A common and wide-spread species. Nests in dead stalks of herbaceous plants and in the cavities of woody plants (Ward 1985) also in various plants as in grasses and sedges (Smith 1979). In Mississippi, Smith (1924a) found this species on chinaberry and pecan. This study found *P. pallidus* in the following macrohabitats: coastal prairie marshes, beech, magnolia-cypress swamp, and lowland mixed-hardwood forest. This species can found in the coastal marsh, southeast mixed pine hardwood forest, west gulf coastal plain longleaf pine forest and tunica loess hills ecoregions. This species can be collected by sweeping or beating

vegetation and has been collected with flight intercept traps. It has also been collected with use pitfall and bait traps.

Range Southern New Jersey south to Florida west to California.

Distribution in Louisiana Beauregard, Caddo, Cameron, East Baton Rouge, Madison, Orleans, Rapides, St. Tammany and West Feliciana Parishes (fig. 51).

Label Data BEAUREGARD PAR., De Ridder, W. Buren (Ward 1985), CADDO PAR., Shreveport, W. Buren & R. A. Cushman (Ward 1985), CAMERON PAR., Cameron Prairie NWR, 29° 56' 43" N 93° 05' 11" W, 20-May-1993, Sweeping, veg in costal prairie marsh, J. A. Masoun (1) MEM; E. BATON ROUGE PAR., Baton Rouge 4-Oct-1936, C. L. Smith (2) LSAM; Baton Rouge, VII-05-1960 (1) LSAM; Baton Rouge, VII-05-1961 (1) LSAM; Baton Rouge, Bluebonnet Swamp, 4-Apr-2004, Beat sheet, A. R. Cline (6) STDC; Baker, Country Lane Site 726, 4-Jun-2003, Sweeping, tree/shrubs, S. T. Dash (4)STDC/FAFC; Nr. LSU Campus off River Rd, Mississippi River Levee, 12-Apr-2003, Sweeping, S. T. Dash (1)STDC, Baton Rouge, s. Choctaw Dr., 11-Oct-2002, by hand, field, N. H. Nguyen (1)STDC; MADISON PAR., nr. Tallulah, E. R. Kalmback (Ward 1985); ORLEANS PAR., New Orleans Audubon Zoo , 6-Jun-1999, Z Lemnon (1)LSAM; New Orleans Audubon Zoo, 6-Oct-1999, pitfall PF13, Behind bird house AC, L. M. Hooper-Bùi (1)FAFC; RAPIDES PAR., Alexandria, 12-Jun-1962, on window, J C Moser, SFRS (1Female); Alexandria, 14-Jun-1972, Screen porch, J Moser, (1Female) SRSS; ST. TAMMANY PAR., Fontainebleau St. Park, 18-Aug-1989, Sweeping, P. R. Miller (1) MEM; Abita Springs, Money Hill golf course, 8-Sep-2000, Sticky trap, A. M. Pranschke (2)FAFC; W. FELICIANA PAR., St. Francisville, Tunica Hills WMA, 24-Oct-2002, Sweeping, M. A. Seymour & S. T. Dash (1)STDC.

Comments Refer to Ward (1985) for a complete description of the species' morphology and host plants along with notes on distribution.

Pseudomyrmex seminole Ward, 1985

Species Diagnosis A larger species than *P. pallidus*. Description from Ward (1985). The median portion of the anterior clypeal margin obtuse. Eyes are relatively short compared to other species. Occipital margin convex or flattened. Metanotal groove shallow. The basal face of the propodeum rounded, curving into the declivitous face. Erect pilosity sparse with more than one pair of erect hairs on the head, postpetiole, and gaster. Similar to *P. pallidus* and the two species occur sympatrically. *P. seminole* have less convergent frontal carinae, shorter eyes, petiole, and postpetiole are longer and more slender than *P. pallidus*.

Natural History Nest in herbaceous plants (Ward 1985) in the southeast mixed pine hardwood forest and Mississippi river alluvial plain ecoregions.

Range Southern Georgia, Florida west to eastern Texas.

Distribution in Louisiana East Baton Rouge and Iberia Parishes (fig. 52).

Label Data E. BATON ROUGE PAR., Baton Rouge, M. R. Smith (Ward 1985), IBERIA PAR., New Iberia A. H. Sturterat (Ward 1985).

Comments Refer to Ward (1985) for a complete description of the species' morphology and host plants along with notes on distribution



Fig. 46 *Pseudomyrmex ejectus*



Fig. 47 *P. gracilis*



Fig 48 *P. pallidus*



Fig. 49 Collection localities for
Pseudomyrmex ejectus



Fig. 50 Collection localities for
P. gracilis



Fig. 51 Collection localities for
P. pallidus



Fig. 52 Collection localities for
P. semiole

Myrmicinae

Key to the Myrmicinae Based on Bolton (1950) and Hölldobler and Wilson (1990).

1 Antenna less than 10 segments.....	2
1' Antenna 10 to 12 segments.....	3
2 Mandibles triangular, stout and short normally lined with denticles.....	<i>Pyramica</i>
2' Mandibles elongate and thin with 2 or 3 spinous teeth at the apex.....	<i>Strumigenys</i>
3 Antenna 10-segmented with two segmented apical club.....	<i>Solenopsis</i>
3' Antenna with more than 10 segments.....	4
4 Antenna with 11 segments.....	5
4' Antenna with 12 segments.....	10
5 Postpetiole attached to the dorsal surface of gaster tergite.....	<i>Crematogaster</i>
5' Postpetiole attached to the anterior face of the first gastric segment.....	6
6 Head in side view with a well defined diagonal carina that extends from mandibles to about the eye.....	7
6' Head in side view without a well define carina.....	<i>Temnothorax</i>
7 Frontal lobes externally expanded laterally cover sides of head... <i>Cyphomyrmex rimosus</i> (fig. 54)	
7' Frontal lobes expanded but not covering sides of head.....	8
8 Frontal lobes expanded over clypeus and antenna insertions, mesosoma lacking large well defined spines or tubercles.....	<i>Mycetosoritis hartmanni</i> (fig.55)
9 Mesosoma with only 3 pairs of spines, gaster and mesosoma lacking tubercles.....	<i>Atta texana</i> (fig.53)
9' Mesosoma with more than 3 pairs of spines and body covered with tubercles..	<i>Trachymyrmex</i>
10 Petiole lacking an anterior peduncle.....	<i>Myrmecina americana</i> (fig. 86)

10' Petiole with a distinct anterior peduncle.....	11
11 Anterior peduncle long, the petiolar node is off set from it, a psammaphore present	
.....	<i>Pogonomyrmex</i>
11 Without these characters.....	12
12 Dorsum of head and mesosoma without erect hairs.....	<i>Cardiocondyla</i>
12' Dorsum of head and mesosoma with at least a few erect hairs.....	13
13 Propodeum unarmed,	<i>Monomorium</i>
13' Proodeum with spines at least small teeth.....	14
14 Posterior area of clypeus raised up forming a narrow ridge around the antennal sockets creating pits in which the antenna arise.....	<i>Tetramorium bicarinatum</i> (fig. 108)
14 Posterior area of clypeus as above.....	15
15 Antenna lacking a distinct apical club.....	16
15' Antenna with a distinct 3 segmented apical club.....	17
16 Tibal spur on the meso and meta legs finely pectinate (hard to see, find the right angle and magnification is the key).....	<i>Myrmica punctiventris</i> (fig. 87)
16' Tibal spur on the meso and meta legs simple, lacking pectinate hairs.....	<i>Aphaenogaster</i>
17 Mandibles with 5 teeth (monomorphic).....	<i>Temnothorax</i>
17' Mandibles with 6 teeth (polymorphic).....	<i>Pheidole</i>

Attini

Atta (Fabricius, 1804)

Generic Diagnosis and Natural History Polymorphic ants with numerous castes.

Workers range from 1.5 to 15 mm. Antennae are 11-segmented and lacking a club. Antennal insertions hidden by frontal carina. Head with longitudinal carina. Their eyes are convex and

distinct. Borders of the occipital lobes with a spine in addition to a large spine on the posterior margin. Mandibles with numerous teeth (Wheeler 1907, Smith 1947). The mesosoma with three pairs of spines, with smaller spines located on the prothorax (Smith 1947). The gaster lacks any tubercles. This genus is unlikely to be confused with any other in Louisiana. Smaller workers superficially resemble *Trachymyrmex*. *Trachymyrmex* lacks three distinct spines on the mesosoma, instead it has numerous small tubercles on the mesosoma. *Atta* is in need of revision and was treated last by Borgmeier in 1959 (Longino 2003). Nests are extensive and found in sandy soils. Species in this genus feed on fungus and are known as the fungus growers. *Atta* species collect vegetation on which to grow their fungus.

Generic Distribution 17 total species (Bolton 1995); two Nearctic species.

Species Recorded from Louisiana (two)

Atta texana (Buckley, 1860)

Myrmica (Atta) texana Buckley, 1860

Diagnosis Description based on Wheeler (1907) and Smith (1963). The head is heart-shaped; the antenna is 11-segmented and lacks an apical club. The anterior margin of the clypeus is emarginated. Head lacking dense long golden hairs. The dorsal portion of the head and the first gastric segment opaque with numerous hairs present (Smith 1963). Frontal groove of the head is strongly defined (Smith 1963). This species is ferruginous brown in color. In addition to being polymorphic, the workers range from 1 to 12.7 mm with at least 15 distinct sizes. The soldier (Fig 2) is 10-12 mm in length, the media (Fig 3) range from 3-9 mm and the minimas are 1-2.5 mm. The queen is about 18 mm long (Wheeler 1907).

Natural History *Atta texana* was once the number one forest insect pest in Louisiana. It was a serious pest before the “Mirex era” (a period of time during the mid 1960s to into the late

1970s where Mirex was widely used as a pesticide) and was considered the major ant pest in Louisiana before the introduction of the red imported fire ant (*Solenopsis invicta*) into the state in the mid 1960s (Moser pers. com). *Atta texana* still continues to cause damage to newly planted crops (especially pines) and is occasionally a nuisance around the farm and home. However, it is much more than a pest; as Wheeler (1907) noted it is one of the few ants that invokes the interest of even non-myrmecologists.

The distribution of this ant is limited in the north (Oklahoma and Arkansas) by temperatures affecting its fungus food source and their acquisition of substrate. It is specific in its soil preferences, found only in extremely sandy soils with low water tables which limit the ants eastern and southern distribution (Moser 1963). *Atta texana* is common in the soil types Norfolk, Orangeburg, Luthbert, Susquehanna and Ruston in the central part of Louisiana (Moser pers. com.); these soil types contain no less than 60% sand (Smith 1939). In Texas however *A. texana* can be found in heavier soils that are from limestone origin, Smith (1939) noted that *A. texana* distribution in Louisiana can be classified as “habitat with longleaf-pines and in which there is a loose sandy type of soil and in which scrub oaks are also present.”

The behavior of *Atta texana* is similar to that of its neotropical relatives create extensive nest, one colony may occupy as many as two hectares in Louisiana (Moser 1967). The surface area of the colony is mostly sand which is either lacking or has little vegetation. With numerous red crater mounds, which are 15 cm to 30 cm in height (Moser 1983). The nest may be as deep as six meters below the soil surface (with a large central cavity) and perhaps deeper in the winter months. Nest densities can be as crowded as several colonies per several hundred meters in favorable situations. More commonly the distribution is from one colony for every 15 to 20 acres to as few as one colony for every 90 acres (Smith 1939). The nest has a number of different types

of cavities such as fungus, detritus, and dormancy. Most of these cavities are found below 1.2 m (Wheeler 1907, Moser 1963). The colony itself is home to thousands of workers and multiple queens. The nest of *A. texana* is a micro-community with at least 80 species living within the fungus gardens and detritus cavities (Waller and Moser 1990). At least three new species of arthropods have been found inhabiting the nests of *A. texana* (Moser pers. com.)

A number of species are only found in *A. texana* colonies, such as a cockroach, *Attaphila fungicola* Wheeler, and a histerid beetle *Geomysaprinus* species. A detailed description of *A. fungicola* can be found in Wheeler (1900) with notes on its biology. Moser (1967) discussed the phoretic nature of it on the female alates of *A. texana*, noting *Attaphila fungicola* are found in the burrows of newly mated queens. The nest structure has been investigated by excavation of nest in Louisiana by Moser 1969 and Neelands 1959. Waller and Moser (1990) presents a table on the species of nest associates, parasites and predators of *A. texana*. They report three other ant species from the nest *Hypoponera opacior*, *Labidus coecus*, and *Neivamyrmex fallax* but did not mention *Neivamyrmex moseri* (see profile for *N. moseri*).

Range Central Texas east to Mississippi flood plain.

Distribution in Louisiana Allen, Beauregard, Bienville, Calcasieu, Grant, Jefferson Davis, La Salle, Natchitoches, Rapides, Sabine, Webster, Winn and Vernon Parishes, are included in the historical range (Smith 1963). Current data suggest that they are found in Rapides, Natchitoches, Grant and Winn (fig.109).

Label Data NATCHITOCHE PAR., 1 mi NNE Lotus 31 30' N 93 7.5' W, 12-Apr-02-Jul-2003, Flight Intercept Trap, A. R. Cline & A. Tishechkin (5)LSAM; Kisatchie 3-19-May-2003, FIT, A.R. Cline (243) LSAM; Kisatchie Nat. For. 1mi NNE of Lotus, 31 30'N 93 7.5 W, 2-Jul-2003, hand coll, S.T. Dash & K.S. O'Brien (40) FAFC; Kisatchie Nat. For. 1mi NNE of Lotus,

31 30'N 93 7.5 W, 15-Aug—Sept-2003, FIT, A. R. Cline (15) FAFC; Kisatchie Nat. For. 1mi NNE of Lotus, 31 30'N 93 7.5 W, 15-Aug—20-Sept-2003, FIT, A. R. Cline (20) STDC; Natchitoches, Kisatchie Nat. For. Kisatchie Rang. Dis. Red Dirt Area, 19-Sep-2003—28-Apr-2004, pitfall nr. *Atta texana* nest mix pine woodland, S. T. Dash (1) STDC; Kisatchie nr. *Atta* nest, 19-Sep-2003 —28-Apr-2004, pitfall, mix pine woodland, S.T. Dash (52) FAFC;

Kistachie National For. Red Bluff Campsite, 13-15-Sept-2002 Pitfall trap, A. M. Pranschke (1) FAFC; Kistachie NF 1.5 mi N Lotus, 31 30' N 93 08' W, 27-Mar-1999 C. Carlton & A. Tishechkin (4) LSAM; RAPIDES PAR., Kistachie National forest, 31° 14' N 92°03' W alt 200' 12-Apr-1959, J. C. Moser in *Atta texana* nest (12) SRSS;

Comments *Atta texana* is one of the two species of *Atta* which is found in the nearctic. The other is *Atta mexicana* F. Smith, which in the U.S., is only found in Organ Pipe National Park in Arizona.

Cyphomyrmex Mayr, 1862

Generic Diagnosis and Natural History Description based on Smith (1947) and Snelling and Longino (1992). Very small to small, monomorphic ants. The body color is variable from dull light brown to dull dark brown; the body with obvious sculpturing. The antenna with 11-segments and lacking an apical club. Eyes are well developed. One of the best diagnostic characters is the frontal lobes, which are conspicuous. These lobes are expanded laterally and cover the antennal insertions and most of the head in full anterior view. These lobes form part of a scrobe. The posterior portion of the head is emarginated (Smith 1947). The thorax has numerous “elevations,” the pronotum with a dorsal pair of “blunt tubercles” (Snelling and Longino 1992). The body has numerous scale-like appressed hairs. Species in this genus form

small colonies, that are found in leaf litter, wood debris and in soil. Like other Attines, *Cyphomyrmex* cultivates fungus, medium used by the this speices is the feces of other insects (Snelling and Longino 1992).

Generic Distribution 37 total species (Bolton 1995); four Nearctic species (Deyrup pers. com.)

Species Recorded from Louisiana (one)

Cyphomyrmex rimosus (Spinola, 1853)

Cryptocerus ? rimosus Spinola, 1853

Meranoplus difformis F. Smith, 1858

Diagnosis An exotic ant, small size blackish-colored ant. The mesosoma with well-developed dorsal tubercles. The head width greater than 0.62mm (Snelling and Longino 1992). The dorsal surface of the gaster with a distinct groove.

Natural History An exotic species. Found in disturbed and undisturbed habitats in Florida (Deyrup et. al. 2000). Collects bits of vegetation and dead insects to use as a substrate for the fungus it grows (Deyrup et. al. 2000). Collected with pitfall, flight intercept, and bait (honey) traps, and sifting litter. It has been found in the following macrohabitats in Louisiana: coastal prairie marsh, pine-hardwood forest, longleaf-pine savanna and urban environments.

Cyphomyrmex rimosus is found in the east gulf-coastal plain longleaf-pine forest, northwest mixed pine-hardwood forest, coastal prairie, and the southeast mixed-pine hardwood forest.

Howard and Oliver (1979) found it in pastures nesting in a water oak truck. Baroni Urbani and Kannowski (1974) found it to be very common in pastures near Hammond, Louisiana.

Range Along the coastal plain of North Carolina south to Florida west to Arizona

Distribution in Louisiana Bossier, Calcasieu, E. Baton Rouge, Iberville (Howard and Oliver 1979), St. Tammany and Tangipahoa Parishes (fig.110).

Label Data BOSSIER PAR., Barksdale AFB, 32° 29' 29" N 93° 35' 07" W, 7-15-Oct-1992, pitfall trap, Coastal prairie marsh, J. MacGown & T. Schiefer (1) MEM; CALCASIEU PAR., Sam Houston Jones State Park, N 30°19' W 93°16' ,11-Jan-2003, sifting litter, A. R. Cline & S. T. Dash (53) STDC/LSAM; E. BATON ROUGE PAR., Baton Rouge, Spanish Town, Insurance Lot, 23-Sep-1999, Honey trap, L. M. Hooper(1) FAFC; RAPIDES PAR., Pineville, 7:00 a.m., male 2-Jul-1997, J. C. Moser (1) SRSS; ST. TAMMANY PAR., Abita Springs, Abita Creek Flatwoods Pres., 17-May-2000 Pitfall trap, A. M. Pranschke (1) FAFC; Abita Springs, Abita Creek Flatwoods Pres., 23-May-2000, Pitfall trap, A. M. Pranschke (5) FAFC; Abita Springs, Money Hill Golf Course 24-May—21-Jun-2000, Pitfall trap, A. M. Pranschke (26) STDC/FAFC; Abita Creek Preserve, 30° 31' 25" N 89° 58' 07" W, FIT/MT, Woods, Longleaf Savanna, wet pine flatwoods, D. Prowell (25) PCOL; Abita Creek Preserve, 30° 31' 25" N 89° 58' 07" W, FIT/MT, open, Longleaf Savanna, wet pine flatwoods, D. Prowell (45) PCOL; Lake Ramsay Preserve WMA, 30° 31' N 90° 10' W, Pitfall, Longleaf-pine Savannah, D. Colby(527) PCOL; TANGIPAHOA PAR., Arcola, Sandy Hollow WMA, 9-Sep-2002, Pitfall trap, Longleaf-pine Savanna, K. E. Landry (9) FAFC/LSAM.

Mycetosoritis Wheeler, 1907

Generic Diagnosis and Natural History Very small, monomorphic ants that are dark in color. Eleven-segmented antennae with terminal segment of the antennae elongate. Occipital border of the head with an angular emargination (Smith 1947). The frontal lobes are expanded into flattened lobes covering the antennae insertions, but are not as greatly expanded as in *Cyphomyrmex*. Wheeler (1907) remarked on the similarity between this genus and

Trachymyrmex and *Cyphomyrmex* stating that *Mycetosoritis* “may be regarded either as a degenerate and simplified *Trachymyrmex* or as an aberrant *Cyphomyrmex*.” They are superficially similar to *Cyphomyrmex* and *Trachymyrmex*. The body is covered with small erect hairs, where as in *Cyphomyrmex* the body is covered in appressed spatulate hairs. Separating *Trachymyrmex* and *Mycetosoritis* can be accomplished by examination of the body topography. In *Trachymyrmex* the dorsal surface of the mesosoma and the gaster with obvious tubercles. *Mycetosoritis* with only the mesosomal tubercles in close proximity to the pronotal spines and completely lacking such tubercles from the gaster.

Generic Distribution four total species (Bolton 1995); one nearctic species

Species Recorded from Louisiana (one)

Mycetosoritis hartmanni (Wheeler, 1907)

Atta (Mycetosoritis) hartmanni Wheeler, 1907

Diagnosis Very small or small red-brown, with some workers darker. Only one species is known to occur in the nearctic. Generic characters will separate it from other attine and ant species. For a more detailed description refer to Wheeler (1907).

Natural History Wheeler (1907) found numerous workers in the vicinity of *Trachymyrmex* colonies. It nests in the open sandy areas. The entrance of the nest is a “turiform crater.” The nests are 52 cm in depth (where Wheeler made his study) with two to four galleries. Fungus grows from the top of the cavity. The substrate used to grow fungus is floral anthers. Colonies are small with only about 60-70 workers (Wheeler 1907). Wheeler (1907) noted it is nocturnal or crepuscular in habitats.

Range Texas and Louisiana (Smith 1979).

Distribution in Louisiana Rapides Parish (fig. 111).

Label Data RAPIDES PAR., Calcasieu, 9-Aug-1960 2:00p.m., Atta texana nest, J. C.

Moser (1) SRSS; Kisatchie National Forest, 92° 36' W 31° 14' N, 2-Aug-1959, on Atta nest, J. C.

Moser (1) SRSS; TINB3WS8 Barton Land., 21-Aug-1960, Atta nest, contents of upper Fungus
gard., J. C. Moser (6) SRSS.

Trachymyrmex Forel, 1893

Generic Diagnosis and Natural History Description based on Wheeler (1907) and Smith (1947). Small to medium sized monomorphic attine ants. Eleven-segmented antenna that lacks an apical club. Eyes are well developed. Mandibles overlap at their apices; mandibles dentate. The occipital border is tuberculate. The pronotum with two distinct spines, with smaller spines between them. The mesosoma is tuberculate and also has a pair of tuberculate spines. A well developed mesoepinotal constriction is present. The propodeum with a pair of spines, each of these spines with a ridge that is tuberculate. The petiole, postpetiole and gaster with numerous tubercles. This genus is unlikely to be confused with any other in Louisiana. It shares superficial resemblance to minor workers of *Atta texana*. Like other attines *Trachymyrmex* cultivates fungus (Wheeler 1907).

Generic Distribution 42 total species (Bolton 1995); 10? nearctic species (Cover pers. com.)

Species Recorded from Louisiana (two*)

*Two species are listed to occur in the state (Smith 1979), however I have not collected *T. turrifex* (Wheeler 1907) or seen any specimens from collections.

Key to species Creighton (1950)

1 Preorbital carina curved mesially, directed backward to the posterior of the

head *Trachymyrmex turrifex*

1' Preorbital carina curved mesially entering the antennal scrobe, not directed backward to the posterior of the head..... *Trachymyrmex septentrionalis* (fig. 56)

Trachymyrmex septentrionalis (McCook, 1880)

Atta septentrionalis McCook, 1880

Atta (Trachymyrmex) septentrionalis var. *obscurior* Wheeler, 1907

Atta (Trachymyrmex) septentrionalis var. *vertebrata* Wheeler, 1911

Atta (Trachymyrmex) septentrionalis var. *seminole* Wheeler, 1911

Atta (Trachymyrmex) septentrionalis var. *crystalline* Wheeler, 1911

Atta (Trachymyrmex) septentrionalis var. *irrorata* Wheeler, 1911

Diagnosis Description based on Wheeler (1907). It is small (2-3mm) red-brown in color. The color maybe obscured because specimens are usually covered in fine grains of sand, thus appearing tan. Antennae are 12-segmented, and the scapes extended beyond the occipital borders of the head. The head is as broad as long. *T. septentrionalis* can be separated from *T. turrifex* with the character, “posterior corner of the head are less pointed” in addition to the character of the scapes surpassing the occipital border. For a more detailed description refer to Wheeler (1907)

Natural History Nest typically comprise of two to three fungus chambers with one to two galleries and are often offset from the nest entrance. This entrance which can be spotted by a crescent of soil surrounding the entrance (Wheeler 1907, Smith 1918, Moser pers. com). With support from minute rootlets the fungus garden grows from the top of the chamber. The substrate used for the fungus is insect excrement such as that from caterpillars and vegetative materials such as catkins, apple blossom petals, and parts of leaves (Wheeler 1907 Smith 1918 Smith 1947). Van Pelt (1958) observed *T. septentrionalis* collecting leaves and seeds discarded by

Pogonomyrmex badius. This ant forages for substrate materials throughout the day, but the hottest part of summer limits foraging to dawn and dusk. In the cooler months the entrance is shut, and the ants stop foraging. The detritus from the fungus is not kept in the nest but rather is expelled from the colony (Wheeler 1907). This shy ant forms small colonies in places with sandy soil. Wheeler (1907) noted it was found only in open canopy woodlands. Cole (1940) also observed the preference for sandy open areas in Smoky Mountains in Tennessee. In western Tennessee, *T. septentrionalis* preferred moist, density shaded localities (Dennis 1938). Smith (1924) also found it in shaded locations in Mississippi. Warren and Rouse (1969) observed it in lawns, oak hickory forest, and in an apple orchard in Arkansas. In Florida at the Weleka Reserve, Van Pelt (1958) found it in dry areas such as flatwoods but never in mesic habitats. In Louisiana it has been collected from mixed hardwood dominated pine forest, mixed flat woods, wet pine flatwood in a long leaf pine savanna, upland longleaf-pine savanna, composite dominated field, beech-magnolia-upland swamp as well as a zoological park. *T. septentrionalis* can be found in the west gulf-coastal plain longleaf-pine forest, Tunica loess hills, southeast mixed pine hardwood forest and the east gulf-coastal plain longleaf-pine-forest ecoregions. It can be collected with pitfall traps, sifting, and flight intercept traps. Specimens were also collected from sweeping wild asters.

Range New York south to Florida west to Texas (Smith 1979).

Distribution in Louisiana Catahoula, East Baton Rouge, Orleans, Tangipahoa, West Feliciana and St. Tammany Parishes (fig.112).

Label Data CATAHOULA PAR., 6 mi W Sicily Island, Sicily Island Hill WMA, 6 mi W Sicily Island, Sicily Island Hill WMA, Sweeping open field , mixed composites and grasses, S. T. Dash & M. A. Seymour (3) STDC; E. BATON ROUGE PAR., Baton Rouge, Bluebonnet

Swamp, 19-Aug-2000, blacklight, A. M. Pranschke (1) FAFC; Waddill Outdoor Education Center, 30° 47' N 91° 15' W, [1-Jul-1999 — 31-Mar-2000], Pitfall, 1 Mixed Flatwood, E.J. Watson (35) Watson-LSAM; ORLEANS PAR., Orleans, New Orleans, Audobon Zoo, 19-Aug-1999, behind zoo exhibits, L. M. Hooper-Bui (1) FAFC; TANGIPAHOA PAR., Arcola, Sandy Hollow WMA, 3-Sep-2002, Pitfall trap, Plot # 2 Trap # 1 Longleaf-pine Savanna, K. E. Landry (2) FAFC; W. FELICIANA PAR., Feliciana Preserve, 30°47' N 91° 15' W, 15-Mar-14-Apr-2003, Flight Intercept Trap, A. Tishechkin (1) STDC; Little, Bayou Sara, 25-May-1963, (1) LSAM; Feliciana Preserve, 30°47' N 91° 15' W, 18-Sep-2002, Sifting litter, A. R. Cline & A. Tishechkin (1) STDC Feliciana Preserve, 30°47' N 91° 15' W, 21-Apr-1999, Sifting litter/berlese, Mixed pine hardwood forest, J. L. Fassbender (1) LSAM; ST. TAMMANY PAR., Abita Creek Preserve, 30° 31' 25" N 89° 58' 07" W, FIT/MT, Woods, Longleaf Savanna, wet pine flatwoods, D. Prowell (2) PCOL; Lake Ramsay Preserve WMA, 30° 31' N 90° 10' W, Pitfall, D, Colby (6) LSAM.

Trachymyrmex turrifex (Wheeler, 1907)

Atta (*Trachymyrmex*) *turrifex* Wheeler, 1907

Diagnosis Description based on Wheeler (1907). It is small (2-3mm) red-brown in coloration. The color may be obscured because some specimens are covered in fine grains of sand thus appearing tan. Antennae are 12-segmented with the scapes extended past the occipital borders of the head. The head is as broad as long. *T. septentrionalis* can be separated from *T. septentrionalis* with the “posterior corner of the head are less pointed” and because the scapes surpass the occipital border. For a more detailed description refer to Wheeler (1907).

Natural History This shy ant forms small colonies in places with sandy or clay soils. It tends to occur in more wooded areas compared to that of *T. septentrionalis* (Wheeler 1907). The

Nests are typically composed of four fungus chambers and three or more galleries. The entrance forms a turret made from surrounding forest litter. The fungus gardens have a great similarity to those of *T. septentrionalis*. The substrate used for the fungus is insect excrement, catkins, flower buds, and parts of old leaves (Wheeler 1907). It was not collected in the current study.

Range Its range is listed by Smith (1979) to include Louisiana. I have searched the literature cited by Smith and I have been unable to find any information on the range extending into Louisiana. Wheeler (1907) lists it as occurring in central Texas cities such as Austin, Paisano Pass, and Del Rio. He noted that the species has only been collected “heretofore only in the dry central and western portions of Texas” (Wheeler 1911b) and “prefers the black or argillaceous soil of the cedar brakes and post-oak woods of central Texas” (Wheeler 1911a). Creighton (1950) does not place this in Louisiana either. Nevertheless a key is presented to ensure that no species would potentially be over-looked.

Crematogastrini

Crematogaster Lund, 1831

Generic Diagnosis and Natural History Small monomorphic ants. Antennae are 11-segmented. Eyes well developed. Head is globular. Mesosoma with epinotal spines present but vary in shape and length amongst species. The petiole is flattened. Attachment of the postpetiole to the dorsal surface of the gaster will allow for this genus to stand out from the others in Louisiana. Species in this genus often are commonly called acrobat ants because, of their defensive stance. *Crematogaster* species hold the gaster up over their body and head, with a spatulate sting exposed (Smith 1947). Colonies can be found in soil, under bark, in rotten wood, and insect galls and some species create carton nests. Species are omnivorous however, favor honeydew secretions of the homopterous insects (Smith 1947). Ecological color morphs exist in a number

of species. Johnson (1988) notes that *C. ashmeadi* and *C. atkinsoni*, as well as a few others, are different colors depending on the habitat. *Crematogaster ashmeadi* for example when found in hardwood habitats the species is uniformly dark when it is found in pine-dominated ecosystems, the species is bicolored black and red.

Two subgenera occur in Louisiana

Crematogaster (Crematogaster) Mayr, 1852

This subgenus has 11-segmented antennae terminating in a three-segmented club. Length and shape of the epinotal spines is variable but, are not normally reduced. Color is variable even within species; nevertheless, no species in Louisiana are concolorous yellow (Smith 1947)

Crematogaster (Orthocrema) Santschi, 1915

This subgenus has the 11-segmented antennae terminating in a two-segmented club. Epinotal spines are stout and reduced. Postpetiole lacks a dorsal depression that is present in *C. (Crematogaster)*. The species in Louisiana are yellowish in color (Smith 1947).

Generic Distribution 427 total species (Bolton 1995); 30 nearctic species

Key to species Johnson (1988) with some modification

- 1 Small (2-3 mm)yellow species with reduced propodeal spines.....
*Crematogaster missuriensis* (fig. 62)
- 1' Larger (2.5-5) species with variable color but never light yellow, propodeal spines not reduced.....2
- 2 Pleuron of pronotum with sculpturing (best seen with a fluorescent light).....3
- 2' Pleuron of pronotum without sculpturing.....5
- 3 A band of erect hairs transverse the anterior dorsum of the pronotum...*Crematogaster lineolata* (fig. 60)

- 3' Erect hairs on the pronotum confined to humeral shoulders.....4
- 4 Mesosomal dorsum with rugose-reticulate sculpturing..... *Crematogaster vermiculata* (fig. 61)
- 4' Mesosomal dorsum with longitudinal striatae with the intervening cuticle granulate or punctate.....*Crematogaster cerasi* (fig. 58)
- 5 Propodeal spines short..... *Crematogaster ashmeadi* (fig. 57)
- 5' Propodeal spines long.....6
- 6 Pubescence on head mesosoma appressed, hairs on head oriented into orderly rows (difficult to judge) *Crematogaster atkinsoni*
- 6' Pubescence on head and mesosoma suberect to erect (more so than in *Crmeatogaster atknsoni*) hairs on head not in orderly rows..... *Crematogaster pilosa* (fig.59)

Species Recorded from Louisiana (six)

Crematogaster ashmeadi Mayr, 1886

Diagnosis Description based on Johnson (1988). Small ants with variable color.

Pubescence on the head, mesosoma and gaster appressed, except for one to three erect humeral hairs. The propodeal spines are short and parallel to the body in dorsal view. The pleuron of the pronotum not heavily sculptured.

Natural History Nests are arboreal in pines, hardwoods and shrubs, in both mesic and xeric habitats (Johnson 1988). In Arkansas it has been found in pine-dominated habitats as well as oak hickory forest (Warren and Rouse 1969). Smith (1924b) found it to nest in twigs, trees, and insect galls. On the Welaka Reserve in Florida, Van Pelt (1958) found colonies in well drained areas, in twigs, galls, and logs, but they were not common in longleaf-pine flatwoods. It has an affinity for honey dew and tends a number of aphid species (Smith 1916, 1924b). In Louisiana, *C. ashmeadi* has been collected in the following macrohabitats; mixed pine-and

hardwood-upland forest, mixed upland hardwood forest, longleaf-pine savanna, wet pine flatwoods. It has been collected with bait vials, pitfall traps and sweeping trees, shrubs, and mixed fields. It has been collected on the fungus *Inorokus dryandens*. *Crematogaster ashmeadi* occurs in the coastal prairie, Mississippi River alluvial plain, southeast mixed pine hardwood forest, west gulf-coastal plain longleaf-pine forest, east gulf-coastal plain longleaf-pine forest ecoregions. Howard and Oliver (1979) found this species only forages on the ground if *S. invicta* is absent or in low numbers. When *S. invicta* is in high numbers *C. ashmeadi* rarely forages below one meter and is aboreal in foraging (they also note *S. invicta* rarely forages above one meter).

Range Virginia south to Florida west to Texas (Smith 1979).

Distribution in Louisiana Calcasieu, Catahoula, East Baton Rouge, East Feliciana, Orleans, Pointe Coupee, Rapides, St. Tammany, and West Feliciana (fig. 113).

Label Data

Crematogaster atkinsoni Wheeler, 1919

Diagnosis Description based on Johnson (1988). Small ants with variable coloration. Pubescence on the head appressed into closely spaced orderly rows. The humeral shoulder with one to two long erect hairs. The propodeal spines are long and straight, their apices diverging distally. The pleron of pronotum lacking sculpturing.

Natural History Found in salt and freshwater marshes. Nest sites are normally in arboreal positions, but has been found in logs. This species can occur in the same areas as *C. pilosa* (Johnson 1988). It has only been collected once with a few individuals at a golf course in St. Tammany Parish, which is located in the east gulf-coastal plain longleaf-pine forest ecoregion.

Range North and South Carolina, Florida, Georgia, Mississippi, Alabama and Tennessee (Smith 1979).

Distribution in Louisiana St. Tammany Parish (fig.114).

Label Data ST. TAMMANY PAR., Abita Springs, Money Hill Golf Course, 10-Mar-2000, A.M. Pranschke (1) FAFC.

Crematogaster cerasi (Fitch, 1854)

Myrmica cerasi Fitch, 1854

Crematogaster (Acrocoelia) kennedyi Wheeler, 1930

Crematogaster (Acrocoelia) lineolata cerasi var. *punctinodis* Enzman, 1946

Diagnosis Description based on Johnson (1988). A small bicolored species that does not appear to have the same variation in color as some other species of *Crematogaster*. Head, mesosoma, and gaster with appressed hairs with one to three erect hairs are present on the humeral shoulders and gaster. The propodeal spines are long and diverge posteriorly. The plueron of the pronotum sculptured, with longitudinal ridges on the dorsum.

Natural History It has been found in mesic hardwoods, upland habitats, xeric areas in Florida as well as agricultural fields. It nests in logs and stumps. It is not arboreal in regards to nest selection (Johnson 1988). In Louisiana, it has been found in mixed hardwood forest and in disturbed habitats. *Crematogaster cerasi* has been collected with bait vials. It is found in the southeast mixed pine hardwood forest and the west gulf-coastal plain longleaf-pine forest ecoregions.

Range Scattered records North Carolina south into Florida, Texas, New Mexico, Utah, Montana, Illinois, Ohio, and Michigan (Smith 1979).

Distribution in Louisiana East Baton Rouge and Rapides Parishes (fig. 115).

Label Data E. BATON ROUGE PAR., Slaughter, Edwards Road, 22-Aug-2002, Vienna Sus Trap, M. A. Seymour (2) FAFC; RAPIDES PAR., Woodworth Alex St. For., 22-Sep-2002, Ant vial, Mixed Hardwood For., K. E. Landry (1)LSAM.

Crematogaster lineolata (Say, 1836)

Myrmica lineolata Say, 1836

Myrmica (Monomarium (!)) marylandica Buckley, 1867

Myrmica (Monomarium (!)) columbiana Buckley, 1867

Crematogaster lineolata lineolata var. *lutescens* Emery, 1895

Diagnosis Description based on Johnson (1988). Small ants that have variable coloration. Pubescence of the head and gaster are appressed. On the mesosoma the hairs form a transverse band across the pronotum. The propodeal spines are long and even and do not diverge as in *C. cerasi* and *C. atkinsoni*. Pleuron of the pronotum with longitudinal ridges and appearing punctuate and granulate.

Natural History *Crematogaster lineolata* is uncommon in the southern part of its range (Johnson 1988). In the northern range of *C. lineolata*, it can be found in mesic forest, fields, and human modified habitats. In the southern part of its range it is in xeric upland, coastal hammocks, and occasionally in human modified habitats. It is not arboreal and nests in logs (Johnson 1988). Dennis (1938) found it nesting in wood, under stones in Tennessee. Cole (1940) found it prefers dry habitats in the Smoky Mountains. Van Pelt (1958) located its colonies in flatwoods, xeric hammocks nesting in the litter soil and decaying wood materials on the Weleka Preserve in Florida. In Arkansas *C. lineolata* has been collected from cotton fields, vineyards, Oak-Hickory forest, under stones, from trees and ground debris (Warren and Rouse 1969). Johnson (1988) notes that he has never observed *C. lineolata* and *C. cerasi* in the same area.

Smith (1916b) found it tending many aphid and scale species. *Crematogaster lineolata* has been collected in the following habitats in Louisiana: upland forest, beech-dominated mixed-hardwood forest, mixed-hardwood forest with some pine species. It has been collected by sifting litter and log material, and sweeping vegetation.

Range New York south to Florida west to Texas and Colorado north to North Dakota.

Distribution in Louisiana Catahoula, East Baton Rouge, Grant, Natchitoches, Pointe Coupee, and Rapides Parishes (fig. 116).

Label Data CATAHOULA PAR., Nr. Sicily Island, Sicily Island Hill WMA, Nr. Check Station, 1-May-2003, Berlese Funnel, upland forest litter, S. T. Dash (7) STDC/LSAM; E. BATON ROUGE PAR., Baton Rouge, Baker, Country Ln, 4-Jun-2003, Sweeping tree/shrubs, Seymour site 726, S. T. Dash (1) LSAM; Baton Rouge, Hooper Rd, BREC Hooper Park, 3-Apr-2003, Sweeping understory, J. Rosson Study site 31, S. T. Dash (1) STDC; Slaughter, Edwards Road, 22-Aug-2002, M. A. Seymour (1) FAFC; GRANT PAR., Kisatchie Nat. Forest, 1 km south, Camp Grant Walker, 1-Jun-2004, sweeping, L. A. Womack (6) LSAM; NATCHITOCHE PAR., Kistachie Nat Forest, Red Dirt Area, Kistachie Bayou Camp, 4-Apr-2003, in log, Beech mix hardwood, S. T. Dash (1) STDC; POINTE COUPEE PAR., Sherburne WMA, N 30 32' W 21 42', 14-Apr—08-Mar-2001, A. R. Cline & A. Tishechkin (3) STDC; RAPIDES PAR., Woodworth Alex St. For., 22-Sep-2002, Ant vial, Plot # 2 Trap # 2, Mixed Hardwood For., K. E. Landry (1) FAFC; Woodworth Alex St. For, 11-Jun-2003, ant vial, Plot # 1 Trap # 2, Mixed Hardwood For., K. E. Landry (1) FAFC; Woodworth Alex St. For, 20-Jun-2002, ant vial, Plot # 1 Trap # 3, Mixed Hardwood For, K. E. Landry (6) LSAM.

Crematogaster pilosa Emery, 1985

Diagnosis Description based on Johnson (1988). Small ants that vary in their coloration. Pubescence on the head and mesosoma, suberect and conspicuous. Two to four hairs are present on the humeral shoulders. The propodeal spines long and divergent. The pleuron of the pronotum not sculptured.

Natural History This is an arboreal species that can be found in mesic forest, agricultural areas, fields, and orchards; only rarely encountered in xeric upland habitats or with pines (Johnson 1988). In Louisiana *C. pilosa* has been collected in mixed flatwood, longleaf-pine savannas, and mixed-hardwood longleaf-pine forest habitats. Use of pitfall, bait, flight intercept traps, sweeping, and sifting have produced specimens. It can be found in the following ecoregions; tunica loess hills and east Gulf Coastal Plain longleaf-pine forest.

Range North Carolina south into Florida, as well as in Tennessee (Smith 1979).

Distribution in Louisiana West Feliciana, and St. Tammany Parish (fig. 117).

Label Data E. BATON ROUGE PAR., Baton Rouge, Dutches Dr, 28-Aug-2002, Sweeping, N. Nguyen (1) STDC; Waddill Outdoor Education Center, 30° 47' N 91° 15' W, [1-Jul-1999 - 31-Mar-2000], Pitfall, Mixed Flatwood, E.J.Watson (54) Watson-LSAM; ST. TAMMANY PAR., Abita Creek Preserve, 30° 31' 25" N 89° 58' 07" W, FIT/MT, Woods, Longleaf Savanna, wet pine flatwoods, D. Prowell (49) PCOL; Abita Creek Preserve, 30° 31' 25" N 89° 58' 07" W, FIT/MT, Open, Longleaf Savanna, wet pine flatwoods, D. Prowell (142) PCOL; Lake Ramsay Preserve WMA, 30° 31' N 90° 10' W, Pitfall, Longleaf-pine Savannah, D. Colby(122) PCOL; Lake Ramsay Preserve WMA, 30° 31' N 90° 10' W, Baits, Longleaf-pine Savannah, D. Colby(411) PCOL; Lake Ramsay Preserve WMA, 30° 31' N 90° 10' W, FIT, Longleaf-pine Savannah, D. Colby(36) PCOL.

Crematogaster vermiculata Emery, 1895

Diagnosis Description based on Johnson (1988). Pubescence on the head, mesosoma and gaster appressed. One to two erect hairs are present on the humeral shoulders. The propodeal spines are long and upwardly curved. Pleuron of the pronotum is sculptured. The dorsum and the pleral region of the pronotum with a rugose texture.

Natural History This species is known to have an affinity for cypress trees, it will nest in any hardwood close to standing water (Johnson 1988). Turner and Cook (1998) note that 13 species of ants nest in cypress trees including two other species of *Crematogaster*; *C. lineolata* and *C. clara*. Van Pelt (1958) found it in hydric hammocks and in very moist areas near river swamps on the Welaka Reserve, it has been found nesting in sweetgum trees. In Louisiana, it has been collected from a beech-magnolia upland cypress swamp in the southeast mixed-pine hardwood forest ecoregion.

Range North Carolina south into Florida also found in Louisiana and Arkansas (Smith 1979).

Distribution in Louisiana East Baton Rouge Parish(fig. 118).

Label Data E. BATON ROUGE PAR., Baton Rouge, Bluebonnet Swamp Nature Center, 15-Mar-2002, along trail, S. T. Dash (1) LSAM.

Crematogaster (Orthocrema) minutissima missuriensis Mayr, 1870

Diagnosis Small, light yellow ants. Description based on Creighton (1950). The dorsal surface of the promesonotum punctuate. *Crematogaster missuriensis* can be differentiated from *C. minutissima minutissima* by the presence of lateral rugae on the anterior portion of the mesosoma. The “propodeal spines are one-half as long as the distance which separates their bases and directed upward.”

Natural History Cole (1940) found it under the bark of a dry pine log in a oak pine forest in the Smoky Mountains. Smith (1924b) found *C. minutissima* nesting in the soil. Van Pelt (1958) found it in both the soil and arboreally. Van Pelt (1958) collected it with Molasses traps. Smith (1937) found some workers in leaf mold in proximity to a seed house in Baton Rouge, Louisiana. I have collected it after spreading a mixture of molasses, beer and yeast on trees to attract moths. In Louisiana, it has been collected in upland-hardwood forest and longleaf-pine savannas. *C. minutissima missuriensis* has been collected in the tunica loess hills and the West Gulf Coastal Plain longleaf-pine forest.

Range South Carolina south into Florida west to Colorado and New Mexico (Smith 1979).

Distribution in Louisiana East Baton Rouge, St. Tammany, and West Feliciana Parishes (fig. 119).

Label Data W. Feliciana Par., N. St. Francisville, Camp Marydale girl scout camp, ?-Aug-2003, moth bait tree, upland hardwoods, S. T. Dash (3) LSAM; N. St. Francisville, Tunica Hills WMA, 31-Jul-1999, sifting litter, Upland Hardwood, J. L. Johnson & T. D. Fassbender (3) STDC/LSAM; ST. TAMMANY PAR., Abita Creek Preserve, 30° 31' 25" N 89° 58' 07" W, FIT/MT, Open, Longleaf Savanna, wet pine flatwoods, D. Prowell (1) PCOL; Lake Ramsay Preserve WMA, 30° 31' N 90° 10' W, Baits, Longleaf-pine Savannah, D. Colby(16) PCOL.

Dacetini

***Pyramica* Roger, 1862**

Generic Diagnosis and Natural History Very small cryptic ants. Description from Bolton (2000). Antenna four, five or six-segmented with a two-segmented apical club is present. A scrobe is present (only rarely absent), and the antennal scape lays dorsally over the eye which

are reduced. The petiole and post petiole often have spongiform tissue. Bolton states that the head and body have “bizarre pilosity of some form usually developed.” This genus closely resembles *Strumigenys* however, the two can be easily separated. In *Strumigenys*, the mandibles are elongate and thin at the apex with two or three spinous teeth. *Pyramica* mandibles are subtriangular often with numerous teeth along the masticatory margin. Species in this genus are found leaf litter and in decaying logs. They are specialized ambush predators of Collembola. Deyrup and Trager (1984) noted that species in this genus may affect “detritivore populations” because of their feeding habits.

Generic Distribution 324 total species; 39 nearctic species (Bolton 2000).

Key to the Species See Bolton (2000).

Species Recorded from Louisiana (15)

Pyramica angulata (M. R. Smith, 1931) (fig.63)

Strumigenys (Cephaloxys) angulata M. R. Smith, 1931

Diagnosis Description from Bolton (2000). Basal lamella of mandible triangular and short; apices of lamellae widely separated when mandible fully closed. Basal lamella very widely separated from basal tooth. Basal and three succeeding teeth on mandible triangular and acute, the second tooth longer than the basal tooth. Anterolateral angles of clypeus distinctly angular in full-face view. Pronotal humeral hairs usually absent but one present in some species.

Natural History Brown (1964) considered it rare. It was collected in upland hardwood forest, mixed hardwood-pine forest in the coastal prairie, and tunica loess hills ecoregions.

Pyramica angulata can be collected when leaf litter is sifted.

Range Scattered records from Arkansas, Mississippi, Alabama, North and South Carolina, and Kentucky, and Illinois (Bolton 2000).

Distribution in Louisiana Calcasieu and West Feliciana Parishes (fig. 120).

Label Data CALCASIEU PAR., Nr Moss Bluff Sam Houston Jones St Park, 11-Feb-2002, sifting leaf litter, A. Cline & S. T. Dash (1) STDC; W. Feliciana, N. St. Francisville, Tunica Hills WMA, 31-Jul-1999, sifting litter, Upland Hardwood, J. L. Johnson & T. D. Fassbender, (1) STDC; Tunica WMA, Magnolia Glen Trail, 7-Nov-1997, Berlese funnel, C. Carlton (1) LSAM.

Pyramica bunki (Brown, 1950)

Strumigenys (Strumigenys) bunki Brown, 1950

Diagnosis Description from Bolton (2000). Mandibles at full closure with a small basal gap; diastema shorter than length of basal tooth. Anterior clypeal margin transverse or its median section feebly concave. Clypeal dorsum with small appressed spatulate to spoon-shaped hairs that are much smaller than those that fringe the lateral margins. Cephalic dorsum behind clypeus with larger broadly spatulate to spoon-shaped ground pilosity, but entirely lacking finer more-erect hairs.

Natural History Found in leaf litter and with similar habits of other species. It has been collected in the east gulf-coastal plain longleaf-pine forest ecoregions.

Range Florida, Georgia, Mississippi, and Louisiana (Bolton 2000).

Distribution in Louisiana St. Tammany Par (fig. 121) .

Label Data St. Tammany Par. Slidell, Bayou Liberty, W. L. Brown (Bolton 2000).

Pyramica carolinensis (Brown, 1964) (fig.64)

Smithistruma carolinensis Brown, 1964?

Diagnosis Description from Bolton (2000). Anterior clypeal margin broad, approximately transverse to shallowly convex and with broadly rounded anterolateral angles. Ground-pilosity of clypeus and head behind clypeus of conspicuous spoon-shaped hairs. Lacking

apicoscrobial hair. Mesonotum with pair of long flagellate hairs. Dorsum of pronotum indistinctly, striolate, mesonotum reticulate-punctate. Pronotum with a median longitudinal carina.

Natural History Brown (1964) cites the type specimens from the forest litter of live oak and loblolly pine in South Carolina. He has also taken specimens in open, mixed-oak woodlands as well (Brown 1964). In Louisiana it has been collected by sifting leaf litter in oak-dominated forest with palmetto understory, and upland-hardwood forest *Pyramica carolinensis* is found in the following ecoregions: Mississippi River alluvial plain, and tunica loess hills.

Range Florida, South and North Carolina (Bolton 2000).

Distribution in Louisiana St. Landry and W. Feliciana Parish (fig. 123) .

Label Data ST. LANDRY PAR., Washington, Thistlewaite WMA off Rice Rd, 11-Jun-2003, sifting leaf litter, Oak dom forest with Palmetto Understory, S. T. Dash & K. S. O'Brien (2) STDC/LSAM; W. FELICIANA PAR., Feliciana Preserve, 30°47' N 91° 15' W, 18-Sep-2002, sifting leaf litter, A. R. Cline & A. Tishechkin (1) LSAM.

Pyramica clypeata (Roger, 1863) (fig. 65)

Strumigenys clipeata Roger, 1863

Strumigenys clypeata Forel, 1886

Diagnosis Type specimen is from Louisiana (Roger, 1863). Description from Bolton (2000). Fully closed mandibles with a small but distinct basal gap between basal tooth and anterior clypeal margin. Dorsum of clypeus glossy with dense appressed short spatulate small hairs. Lateral clypeal margins with a row of anteriorly curved spatulate hairs that stand out from the surface by being larger than those on the clypeal dorsum. Clypeus without visible bimargination. Ground-pilosity of head spatulate to filiform. Dorsolateral margin of head with

two to three projecting fine flagellate hairs present at pronotal humeri. Spongiform tissue present.

Natural History Brown (1964) collected it in wood debris in a bottomland forest swamp in Alabama. Dennis (1938) found them in a well decayed pine log in a pine thicket in Tennessee. In Florida on the Welaka Reserve, Van Pelt (1958) found it in xeric hammocks in the leaf litter and soil. In Louisiana, it has been collected in longleaf-pine savannas, and wet flatwoods. Specimens have been taken with flight intercept and malaise traps.

Range New York south to Florida west to Texas (Bolton 2000).

Distribution in Louisiana St. Tammany Parish (fig.124) .

Label Data ST. TAMMANY PAR., Abita Creek Preserve, 30° 31' 25" N 89° 58' 07" W, FIT/MT, Open Longleaf Savanna, wet pine flatwoods, D. Prowell (1) PCOL; Lake Ramsay Preserve WMA, 30° 31' N 90° 10' W, FIT, Longleaf-pine Savannah, D. Colby (2) PCOL.

Pyramica dietrichi (M. R. Smith 1931) (fig.66)

Strumigenys (Cephaloxys) dietrichi M. R. Smith, 1931

Diagnosis Description from Bolton (2000). Fully closed mandibles with a gap between basal tooth and anterior clypeal margin that is longer than the length of the basal tooth. Clypeus bluntly pointed apically with a pair of hairs closest to apex of point strongly curve away from the midline. Other stout hairs that project beyond outline of lateral clypeal margins are sparse and simple. Anterior edge clypeus with an apicodorsal series of six to eight stout stand-alone hairs that radiate from the apex like the ribs of a fan, these hairs not strongly bulbous at their apices and in profile not obviously curved posteriorly.

Natural History Small colonies found in well-decayed logs and stumps forming (Dennis 1938. Van Pelt 1958). In Louisiana, *P. dietrichi* inhabits mix pine-hardwood and bottomland

hardwood forest. This species has been collected by sifting leaf litter and decayed log material. It has been found in the Mississippi River alluvial plain and the tunica loess hills ecoregions.

Range Scattered Records. North Carolina South to Florida west to Oklahoma north to Illinois(Bolton 2000).

Distribution in Louisiana Madison, Pointe Coupee, and West Feliciana Parishes (fig.125).

Label Data MADISON PAR., Tallulah, Tensas National Wildlife Refuge, 32° 24' N 09° 11' W, 24-Mar-2004, sifting leaf litter and decaying log, Mix hardwood, S. T. Dash (2) STDC; POINTE COUPEE PAR., off Highway 975, Sherburne WMA , 22-Jan-2004, sifting leaf litter, decaying logs, fungi, Bottomland hardwood, S. T. Dash & A. R. Cline (4) STDC; W. FELICIANA PAR., Feliciana Preserve, 30°47' N 91° 15' W, 18-Sep-2002, sifting leaf litter, A. R. Cline & A. Tishechkin (1) LSAM.

Pyramica hexamera (Brown, 1958) (fig. 67)

Epitritus hexamerus Brown, 1958

Diagnosis Description from Bolton (2000). Apicodorsal tooth of mandible elongate and spiniform. Mandible with two preapical teeth. Dorsal surface of mandibles and scapes with orbicular hairs. Hairs on leading edge of scape curved toward apex of scape. Mesonotum in profile bulging posteriorly over base of propodeum, overhanging metanotal groove.

Natural History Bolton (2000) considers this species to be an introduced in the new world. It was collected in upland cypress swamp, beech-magnolia dominated hardwood forest, and mixed-upland hardwood forest. It has been collected with pitfall traps, and sifting log material and litter. It has been collected in the following ecoregions: tunica loess hills, and southeast mixed pine-hardwood forest.

Range Recorded from Japan. Also two records in US, Marion county in Florida (Deyrup et. al. 1989) and from Louisiana (Bolton 2000).

Distribution in Louisiana East Baton Rouge, St. Tammany, Iberia (Bolton 2000), and W. Feliciana Parishes (fig.126).

Label Data E. BATON ROUGE PAR., Baton Rouge Bluebonnet Swamp, 30° 22' 14" N 91° 06' 30" W, 1-Jul-2003, sifting log matter, upland cypress swamp, beech magnolia, S. T. Dash (1)STDC; ST. TAMMANY PAR., Abita Springs, Abita Creek Flatwoods Pres. 23-May-2000, pitfall trap, A. M. Pranschke (1) LSAM; IBERIA CO., New Iberia, 19.viii.1987, pitfall trap, forest area, no. 19793 (W. MacKay) (UTEL) (Bolton 2000); W. FELICIANA PAR., Feliciana Preserve, 30°47' N 91° 15' W, 24-Apr-21-May-2003, mix Upland Hardwood, A. Tishechkin (1) LSAM); N. St. Francisville, Tunica Hills WMA, 31-Jul-1999, sifting litter, Upland Hardwood J. L. Fassbender (5) STDC/LSAM.

Pyramica hyalina Bolton 2000 (fig.68)

Diagnosis Description from Bolton (2000). Fully closed mandible with a distinct basal gap that is longer than the basal tooth. Teeth of principal basal row small and narrow, the first tooth two times longer than the second; tooth three equal in length to one or slightly longer; tooth four shorter than three. Tooth five longer than four. Anterior clypeal margin transverse or very shallowly convex. Dorsum of clypeus with numerous very broadly spatulate or spoon-shaped hairs which are strongly curved. Lateral clypeal margins with a fringe of anteriorly curved hairs that are very broadly spatulate or spoon-shaped and very conspicuous. Apicoscrobial hair very long and flagellate. Pronotal humeri each with a extremely long fine flagellate hair. The Pronotal dorsum and the mesonotum each with a pair of long fine flagellate hairs.

Natural History In Louisiana it has been collected with flight intercept traps, in longleaf-pine savanna, and in the east gulf-coastal plain longleaf-pine forest ecoregions.

Range Mississippi, Indiana, and Ohio (Bolton 2000).

Distribution in Louisiana St. Tammany Parish (fig.127).

Label Data St. Tammany Par., Lake Ramsay Preserve WMA, 30° 31' N 90° 10' W, FIT, Longleaf-pine Savannah, D. Colby(2) PCOL.

Pyramica margaritae (Forel, 1893) (fig.69)

Strumigenys margaritae Forel, 1893

Diagnosis Description from Bolton (2000). Counting from base of mandible teeth, one, three, five, and seven are narrow acute, and relatively high; teeth two, four, and six are blunt apically and each is only half the height of those preceding. First gastral tergite conspicuously densely sculptured everywhere. Apicioscrobal hair and pronotal humeral hair are absent. The petiole and postpetiole lacking any spongiform tissue.

Natural History An exotic species that is considered to be rare. A few specimens have been collected in a longleaf-pine savanna wet pine flatwood in the east gulf-coastal plain longleaf-pine forest and in a zoological park in New Orleans.

Range Mexico south to Columbia, St. Vincent, Dominica, Puerto Rico, and Bahamas (Bolton 2000).

Distribution in Louisiana Orleans, and St. Tammany Parishes (fig.128).

Label Data ORLEANS PAR., New Orleans Audubon Zoo, 19-Aug-1999, Pit fall PF 5, behind gorillas, L.M. Hooper-Bui & A. M. Pranschke (1) FAFC; St. Tammany Par., Abita Creek Reserve, 30° 31' 25" N 89° 58' 07" W, FIT/MT, Woods, Longleaf Savanna, wet pine flatwoods, D. Prowell (1) PCOL; Abita Creek Preserve, 30° 31' 25" N 89° 58' 07" W, FIT/MT,

Open, Longleaf Savanna, wet pine flatwoods, D. Prowell (1) PCOL; Lake Ramsay Preserve WMA, 30° 31' N 90° 10' W, Pitfall, Longleaf-pine Savannah, D. Colby (19) PCOL; Lake Ramsay Preserve WMA, 30° 31' N 90° 10' W, FIT, Longleaf-pine Savannah, D. Colby(6) PCOL.

Pyramica membranifera (Emery, 1896) (fig.70)

Strumigenys (Trichoscapa) membranifera Emery, 1896

Diagnosis Description from Bolton (2000). Without a distinct diastema basally. Dorsal surface of fully closed mandible basally with very distinct sharp transverse edge or rim running across the width of the blade, parallel to and in front of the anterior clypeal margin. Pronotum sharply marginate dorsolaterally, the dorsum transversely flattened and unsculptured. First gastral tergite without standing hairs of any form.

Natural History An exotic species, that is widely distributed “tramp” species (Bolton 2000). Nest in the soil beneath objects (Smith 1932). *Pyramica membranifera* has been collected in longleaf-pine savanna in pitfall traps, in the east gulf-coastal plain longleaf- pine forest ecoregion.

Range Bhutan, Taiwan, Gaum, Fiji, and USA.

Distribution in Louisiana E. Baton Rouge, and St. Tammany Parishes (fig. 129).

Label Data LA, Baton Rouge (W. F. Buren); LA, Paradise (R. S. Howard) from Bolton (2000); E. BATON ROUGE PAR., Baton Rouge Spanish Town, 19-Jul-2000, Presb Apts, bait Trap, L. M Hooper (1) STDC; ST. TAMMANY PAR., Abita Creek Preserve, 30° 31' 25" N 89° 58' 07" W, FIT/MT, Woods, Longleaf Savanna, wet pine flatwoods, D. Prowell (7) PCOL; Abita Creek Preserve, 30° 31' 25" N 89° 58' 07" W, FIT/MT, Open, Longleaf Savanna, wet pine flatwoods, D. Prowell (16) PCOL; Abita Springs, Money Hill Golf Course, 23-May-2000, pitfall trap, A. M. Pranschke (1) FAFC; Abita Springs, Money Hill Golf Course, 14-Jun-2000, pitfall trap, A. M.

Pranschke (3) LSAM; Abita Springs, Money Hill Golf Course, 28-Jun-2000, pitfall trap, A. M.
Pranschke (1) LSAM; Abita Springs, Money Hill Golf Course, 3-Aug-2000, pitfall trap, A. M.
Pranschke (3) STDC; Abita Springs, Money Hill Golf Course, 8-Sep-2000, pitfall trap, A. M.
Pranschke(3) FAFC; Abita Springs, Money Hill Golf Course, 21-Jun-2001, pitfall trap, A. M.
Pranschke (4) FAFC; Lake Ramsay Preserve WMA, 30° 31' N 90° 10' W, Pitfall, longleaf-pine
Savannah, D. Colby(3) PCOL; Lake Ramsay Preserve WMA, 30° 31' N 90° 10' W, FIT,
longleaf-pine Savannah, D. Colby(18) PCOL;

Pyramica metaxytes Bolton, 2000 (fig.71)

Diagnosis Description from Bolton (2000). Anterior clypeal margin extremely shallowly convex almost transverse in full-face view. Dorsum of clypeus with inconspicuous subappressed small spatulate hairs that are very much smaller than the anteriorly curved spoon-shaped hairs on the lateral clypeal margins. Apicoscrobal hairs present, flagellate. Pronotal dorsum with one pair of erect filiform hairs. Dorsal mesosoma and petiole noded finely, superficially reticulate-punctate everywhere.

Natural History *Pyramica metaxytes* has been collected in upland hardwood forest, loblolly-shortleaf pine and upland hardwood forest, longleaf-pine savanna. It has been collected by sifting leaf litter. It is found in the Mississippi River alluvial plain and east gulf-coastal plain longleaf-pine forest.

Range Tennessee and Kentucky (Bolton 2000).

Distribution in Louisiana Catahoula and St. Tammany Parishes (fig. 130).

Label Data CATAHOULA PAR., Sicily Island, Sicily Island Hill WMA, 1-May-2003, berlese 2, sifting, leaf litter, loblolly-shortleaf pine and upland hardwoods S. T. Dash (1) STDC;

ST. TAMMANY PAR., Lake Ramsay Preserve WMA, 30° 31' N 90° 10' W, FIT, longleaf Pine Savannah, D.Colby (2) PCOL.

Pyramica ohioensis (Kenndey and Schramm, 1933) (fig. 72)

Strumigenys ohioensis Kenndey and Schramm, 1933

Strumigenys (Cephaloxys) manni Wesson and Wesson 1934

Diagnosis Description from Bolton (2000). Mandibular teeth strong and conspicuous, the first tooth following the basal lamella without a diastema. Anterior clypeal margin appearing transverse but at high magnification can be seen to be very shallowly convex. Lateral margins of clypeus with narrowly spatulate projecting hairs that are J-shaped. Dorsum of clypeus with narrowly spatulate curved hairs, that are mostly decumbent. Flagellate hair absent from hind tibia but present on basitarsus.

Natural History Warren and Rouse (1969) collected it from ground debris in Arkansas. Brown (1964) notes it can readily be taken in leaf litter. In Louisiana, it has been collected in loblolly-shortleaf pine, upland-hardwood forest, upland beech-magnolia dominante hardwood forest, mixed upland hardwood, and pine-mixed upland hardwood forest. *Pyramica ohioensis* is found in the tunica loess hills, coastal prairie, and west gulf-coastal plain longleaf-pine forest.

Range Virginia south into Florida west to Texas north to Illinois (Bolton 2000).

Distribution in Louisiana Catahoula, Evangeline, and West Feliciana Parishes (fig.131).

Label Data CATAHOULA PAR., 6 mi W Sicily Island, Sicily Island Hill WMA, 1-May-2003, berlese 2, sifting leaf litter, pine-mixed upland hardwoods, M. A. Seymour & S. T. Dash (1) FAFC; W. FELICIANA PAR., Tunica Hills WMA, 31-Jul-1999, Sifting, Upland Hardwood, J. L. Johnson & T.D.Fassbender (15) LSAM.

Pyramica ornata (Mayr, 1887) (fig. 73)

Strumigenys ornata Mayr, 1887

Diagnosis Description from Bolton (2000). Fully closed mandibles with a gap between basal tooth and anterior clypeal margin. Clypeus with a short transverse to feebly convex anterior margin; hairs at anterolateral clypeal angle curved strongly away from the midline and bulbous apically. The unique clypeal pilosity, makes this species unmistakable.

Natural History Smith (1931) collected *P. ornata* from leaf litter and ground debris from an oak stand in Mississippi. In Louisiana, it has been collected by sifting litter, decaying logs and searching under bark. *Pyramica ornata* inhabits upland-hardwood forest in the Mississippi River alluvial plain, coastal prairie, and tunica loess hills ecoregions.

Range Oklahoma and Texas east to Virginia north to Michigan (Bolton 2000).

Distribution in Louisiana Calcasieu, Madison, and West Feliciana Parishes (fig. 132).

Label Data LA: Calhoun, H. H. Ross (Brown 1964); Jena, H. H. Ross (Brown 1964); Minden, H. H. Ross (Brown 1964); CALCASIEU PAR., Nr. Moss Bluff, Sam Houston Jones St. Park, 30° 19' N 93° 16' W, 19-Feb-2003, under bark of log, S. T. Dash (1) LSAM; MADISON PAR., Tallulah, Tensas National Wildlife Refuge, 32° 24' N 09° 11' W, 24-Mar-2004, sifting leaf litter and decaying log, S. T. Dash (1) FAFC; Tallulah, Tensas National Wildlife Refuge, 32° 24' N 09° 11' W, 24-Mar-2004, sifting leaf litter and decaying log, Mix hardwood, S. T. Dash (1) STDC; W. FELICIANA PAR., Feliciana Preserve, 30° 47' N 91° 15' W, 18-Sep-2002, sifting leaf litter, A. R. Cline & A. Tishechkin (1) LSAM.

Pyramica pilinasis (Forel, 1901)

Diagnosis Description from Bolton (2000). Teeth of mandible strong and conspicuous, either lacking a diastema between basal lamella and basal tooth or diastema is minute. Anterior clypeal margin evenly and narrowly rounded. Clypeus in profile with the upper and lower

margins distinct. Dorsum of clypeus with dense curved narrowly-spatulate ground-pilosity close to midline directed anteriorly. Hairs on lateral clypeal margins narrowly spatulate, much longer than those on dorsum of the clypeus. Cephalic ground pilosity is long and fine. Hairs on leading edge of scape fine, very narrowly spatulate. Vertex of head near occipital margin with a transverse row of four much longer, finer flagellate hairs. A pair of flagellate hairs present on the pronotal dorsum and mesonotum.

Natural History Found in leaf litter and appears to have very similar habitats of the other species of *Pyramica*.

Range Pennsylvania south to Georgia west to Louisiana north to Illinois (MacKay and Anderson 1993, Bolton 2000).

Distribution in Louisiana Bolton (2000) cites previous state records from Louisiana (fig. 133).

Pyramica pulchella (Emery, 1895)

Strumigenys pulchella Emery, 1895

Diagnosis Description from Bolton (2000). Lateral clypeal margins with a fringe of anteriorly curved spatulate to spoon-shaped hairs. Anterior clypeal margin broadly convex; above the mandible with two hairs that curve away from the midline. Dorsum of clypeus very shallowly concave with very small spatulate hairs. Cephalic dorsum behind clypeus with spatulate ground-pilosity and with one to two pairs of fine filliform to flagellate hairs behind highest point of vertex. Long fine flagellate hairs also present at pronotal humeri. A flagellate apicoscrobial hair is present, Lacking a posteriorly curved pilosity on the lateral clypeal margins.

Natural History Found in the leaf litter like other species of *Pyramica*

Range Scattered records this species include New York south to Florida west to Louisiana north to Michigan (MacKay and Anderson 1993, Bolton 2000).

Distribution in Louisiana Bolton (2000) cites previous state records from Louisiana(fig.134) .

Pyramica reflexa (Wesson and Wesson, 1939) (fig.74)

Strumigenys (Cephaloxys) reflexa Wesson and Wesson, 1939

Diagnosis Description from Bolton (2000). Anterior clypeal margin broadly convex and its dorsum depressed. Curved spoon-shaped hairs on anterior and lateral clypeal margins mostly or entirely curved posterolaterally. Smaller spoon-shaped hairs on clypeal dorsum close to the margins also curved posteriorly or posterolaterally. Most of the clypeal hairs peripheral, central area of disc hairless. Pronotal humeral hair long and fine, filiform erect hairs that are more or less straight. Dorsal surface of hind basitarsus with one-two very fine projecting flagellate hairs.

Natural History In Louisiana, *P. reflexa* has been collected in a longleaf-pine savanna, with flight intercept traps. It has been found in the following ecoregion east gulf-coastal plain longleaf-pine forest.

Range Scattered records included West Virginia, Florida, Alabama, Texas, Arkansas, Ohio, Illinois, North Carolina, Tennessee, and Missouri (Bolton 2000).

Distribution in Louisiana St. Tammany Parish(fig.135) .

Label Data ST. TAMMANY PAR., Lake Ramsay Preserve WMA, 30° 31' N 90° 10' W, FIT, longleaf pine Savannah, D. Colby (2) PCOL.

Pyramica rostrata (Emery, 1895) (fig. 75)

Strumigenys rostrata Emery, 1895

Diagnosis Description from Bolton (2000). Basal lamella longer than any teeth, feebly recurved; without a diastema between lamella and basal tooth. Thooth one through five strongly developed, coarse and conical; teeth three and five are longer than four, tooth three is the longest on the margin but only slight more so than five. Teeth six and seven also strongly developed and conical, shorter than one and five. Apicoscrobial hair fairly stout and curved blunt or truncate apically. Cephalic dorsum with four curved suberect hairs close to occipital margin. Pronotal humeral hair stout. Species similar to *P. bunki*, *P. carolinensis*, and *P. hyaline* see those species for diagnosis.

Natural History Nest in logs and stumps forming small colonies (Dennis 1938). In Arkansas, Warren and Rouse (1969) found it in ground debris. In Louisiana, *P. rostrata* oak dominated hardwood forest, with palmetto understory, upland hardwood forest, and longleaf-pine savanna.

Range Pennsylvania south to Florida west Texas North to Illinois (Bolton 2000).

Distribution in Louisiana East Feliciana, St. Landry, St. Tammany, and West Feliciana Parishes (fig.136).

Label Data E. FELICIANA PAR., Port Hudson, Port Hudson St. Comm. Area, 4-Jun-2003, sifting leaf litter, Seymour study Site 768, S. T. Dash (8) STDC; NATCHITOCHE PAR., Kisatchie, 20-Jul-2003, sifting, A. R. Cline (3) FAFC; ST. LANDRY PAR., Washington, Thistlewaite WMA off Rice Rd, 11-Jun-2003, sifting leaf litter, Oak dom forest with Palmetto understory, S. T. Dash & K. S. O'Brien (1) STDC; W. FELICIANA PAR., N. St. Francisville, Tunica Hills WMA, 31-Jul-1999, sifting litter, Upland Hardwood, J. L. Johnson & T. D. Fassbender (1) LSAM.

Pyramica talpa (Weber, 1934) (fig.76)

Strumigenys talpa Weber, 1934

Diagnosis Description from Bolton (2000). Fully closed mandibles with a basal gap between anterior clypeal margin and basal tooth that is distinctly longer than length of basal tooth. In anterior view lateral clypeal margins with a continuous fringe of distinctly projecting, anteriorly curved hairs that are spatulate to very feebly spoon-shaped. A row of hairs on clypeal dorsum that is closest to lateral margin also project outward. Anterior clypeal margin without hairs that curve away from the midline. Dorsolateral margin of head with a single projecting flagellate hairs in the apicoscrobial position. Occipital margin with one to two pairs of flagellate hairs. Flagellate hairs also present at pronotal humeri on pronotal dorsum and mesonotum.

Natural History Van Pelt (1958) found it in mesic and hydric hammocks the soil and litter of these areas at the Welaka Reserve in Florida. In Louisiana, *P. talpa* has been found in longleaf-pine savanna in the west gulf-coastal plain longleaf-pine forest.

Range Ohio, Illinois, South Carolina south to Florida west to Louisiana (Bolton 2000).

Distribution in Louisiana St. Tammany Parish (fig. 137).

Label Data ST. TAMMANY PAR., Abita Creek Preserve, 30° 31' 25" N 89° 58' 07" W, FIT/MT, Woods, Longleaf Savanna, wet pine flatwoods, D. Prowell (1) PCOL; Lake Ramsay Preserve WMA, 30° 31' N 90° 10' W, Pitfall, longleaf Pine Savannah, D. Colby (10) PCOL; Lake Ramsay Preserve WMA, 30° 31' N 90° 10' W, FIT, longleaf Pine Savannah, D. Colby (4) PCOL.

Strumigenys Smith, 1860

Generic Diagnosis and Natural History and Natural History Very small cryptic ants. Description from Bolton (2000). Antenna four, five or six-segmented with a two-segmented apical club is present. A scrobe is present (only rarely absent) and the antennal scape lays dorsally over the eyes, which are reduced. Petiole and postpetiole often with spongiform tissue.

Bolton states that the head and body have “bizarre pilosity of some form, usually developed.” The mandible long and thin, the apex with two to three spinous teeth. The “mandibles arises from apex of labio-maxillary complex.” The posterior margin of the head emarginated. This genus maybe confused with *Pyramica*, see generic description for characters to distinguish them. Species in this genus are found in leaf litter and in decaying logs. They are specialized ambush predators of Collembola.

Generic Distribution 466 total species; four nearctic species (Bolton 2000)

Key to the Species: modified from Bolton (2000)

- 1 Pronotal humeral hairs flagellate.....*Strumigenys louisianae*(fig.77)
 1' Pronotal humeral hairs short and stiff..... *Strumigenys silvestrii*

Species Recorded from Louisiana (two):

Strumigenys louisianae Roger, 1863

Strumigenys unidentata Mayr, 1887

Strumigenys unispinulosa Emery, 1890

Strumigenys unispinulosa var. *longicornis* Emery, 1894

Strumigenys fusca Emery, 1894

Strumigenys louisianae var. *obscuriventris* Wheeler, 1908

Strumigenys bruchi Forel, 1912

Strumigenys infidelis Santschi, 1919

Strumigenys eggersi. var. *cubaensis* Mann, 1920

Strumigenys (Strumigenys) louisianae laticephala Smith, 1931

Strumigenys (Strumigenys) louisianae soledadensis Weber, 1934

Strumigenys (Strumigenys) louisianae guatemalensis Weber, 1934

Strumigenys (Strumigenys) louisianae costaricensis Weber, 1934

Strumigenys clamospongia Brown, 1953

Strumigenys producta Brown, 1953

Diagnosis Description from Bolton (2000). A very small brown to tan ant. The mandibles without denticles proximal to the preapical tooth. Head with a single pair of short, erect hairs. The pronotal humeral hairs are flagellate. Ventral surface of petiole without spongiform tissue.

Natural History Dennis (1938) found a colony in a tree stump 22.5 cm underground. Smith (1932) collected it from the soil in Mississippi. On the Welaka Reserve in Florida, Van Pelt (1958) found *S. louisianae* in mesic river swamps in both dry and moist wood. In Louisiana *S. louisianae* has been collected in pine-hardwood mixed forest, bottomland hardwood forest, beech magnolia upland cypress swamp mixed flatwoods, longleaf-pine savanna and from a zoological park. Specimens have been taken with pitfall, flight intercept traps as well as sifting decaying logs and leaf litter.

Range North Carolina south to Florida west to Texas, also in Arizona, and Tennessee (Bolton 2000).

Distribution in Louisiana Calcasieu, Catahoula, East Baton Rouge, East Feliciana, Evangeline, Natchitoches, Orleans, Pointe Coupee, St. Tammany and West Feliciana Parishes (fig. 138).

Label Data CALCASIEU PAR., N. Moss Bluff, Sam Houston Jones State Park, 16-May-2003, sifting dead log, Hardwood forest, S. T. Dash (1) STDC/LSAM; Sam Houston Jones State Park, W. MacKay (Bolton 2000); CATAHOULA PAR., Walkers-Catahoula NWR, 25-May-2004, Sifting, Lowland hardwood Forest, S. T. Dash & L. A. Womack (1); STDC/LSAM; Sicily Island, Sicily Island Hill WMA, 1-May-2003, Sifting leaf litter, Berlese set 2, loblolly-shortleaf

pine and upland hardwoods, S. T. Dash (1); E. BATON ROUGE PAR., Baton Rouge Bluebonnet Swamp, 30 22' 14" N 91 06' 30" W, 1-Jul-2003, sifting log mater, Beech Magnolia upland cypress swamp, S. T. Dash (1); Baton Rouge Bluebonnet Swamp, 4-Nov-2002, sifting leaf litter, S. T. Dash (1); Waddill Outdoor Education Center, 30° 47' N 91° 15' W, [1-Jul-1999 - 31-Mar-2000], Pitfall, Mixed Flatwood, E. J. Watson, (11) LSAM; E. FELICIANA PAR., Port Hudson, Port Hudson St. Com. Area, 4-Jun-2003, Sifting forest leaf litter, Seymour study site 768, S. T. Dash (1); EVANGELINE PAR., St Landry, Chicot St Park, Hiking trail, 19-Feb-2003, under bark, Upland Beech Magnolia, S. T. Dash (1) STDC; NATCHITOCHE PAR., Kisatchie Nat. Forest, Kisatchie Bayou, 20-VII-2003, sifting, A. R. Cline (3) STDC/LSAM; ORLEANS PAR., New Orleans, Audubon Zoo, 19-viii-1999, behind zoo exhibits, L. M. Hooper-Bui (1); POINTE COUPEE PAR., off Highway 975, Sherburne WMA, 22-Jan-2004, sifting leaf litter, decaying logs, fungi, Bottomland hardwood, S. T. Dash & A. R. Cline (2) STDC/LSAM; ST. TAMMANY PAR., Lake Ramsay Preserve WMA, 30° 31' N 90° 10' W,?, Pitfall, D. Colby (28) PCOL; Lake Ramsay Preserve WMA, 31' N 90° 10' W, ?, FIT , D. Colby (7) PCOL; Abita Creek Preserve, 30° 31' 25" N 89° 58' 07" W, FIT/MT, Woods, Longleaf Savanna, wet pine flatwoods, D. Prowell (16) PCOL; Abita Creek Preserve, 30° 31' 25" N 89° 58' 07" W, FIT/MT, Woods, Longleaf Savanna, Open, Longleaf Savanna, wet pine flatwoods, D. Prowell (8) PCOL; W. FELICIANA PAR., Feliciana Preserve, 30°47' N 91° 15' W, 18-Sep-2002, sifting leaf litter, A. R. Cline & A. Tishechkin (2) STDC/LSAM; N. St. Francisville, Tunica Hills WMA, 31-Jul-1999, sifting, Upland Hardwood, J.L. Johnson & T. D. Fassbender (25) STDC/LSAM; Tunica Hills WMA, 31-Jul-1999, Sifting, Upland Hardwood, J. L. Johnson & T. D. Fassbender (22) STDC/LSAM.

Strumigenys silvestrii Emery, 1905

Strumigenys (Strumigenys) caribbea Weber, 1934

Diagnosis The apical portion of the mandible with a minute intercalary denticle, the mandible with a preapical tooth located very close to the apicodorsal tooth. A pair of short hairs exist on the head and pronotoal humerus. Spongiform tissue on the petiole lobe is vestigial or absent.

Natural History An exotic species thought to have originated in South America (Bolton 2000). In Louisiana it was found in an upland hardwood forest that was dominated by beech and magnolia. Collection was made by sifting leaf litter. *Strumigenys silvestrii* occurs in the west gulf-coastal plain longleaf-pine forest ecoregion.

Range Louisiana (Bolton 2000).

Distribution in Louisiana Evangeline Parish (fig 139).

Label Data EVANGELINE PAR., St. Landry, Chicot State Park, Hiking trail, 27-Jun-2003, sifting leaf litter and fungus, Upland Beech Magnolia, S. T. Dash (1) LSAM.

Formicoxenini

Cardicondyla Emery, 1869

Generic Diagnosis and Natural History and Natural History Monomorphic, very small to small sized ants. Species of this genus are elongate. Antenna are 12-segmented with a three-segmented club. Eyes are distinct. The frontal carinae are short. The clypeus projects over the mandibles. The promesonal suture is absent. Epinotal spines are present and vary in length. Pubescence appressed erect hairs are completely absent from most of the body. The post-petiole is dorsoventrally flattened and is wider than the petiole (Smith 1947 Smith 1979). Males are ergatoid. Nests are found in soil and plant cavities (Smith 1947). Similar in habits to *Leptothorax* (Smith 1944). Forming small nest that are hard to detect (Creighton and Snelling 1974). This is considered to be a non-native genus (Creighton 1950, Smith 1944). Smith (1944) mentions the

potential of this genus' dispersal capabilities given that the species forms small colonies and nests in plants and soil; makes transport by commerce easier (Smith 1979). Species in this genus tend to be carnivorous.

Generic Distribution 38 total species (Bolton 1995); four nearctic Species (MacKay 1995).

Key to Species based on MacKay (1995).

- 1 Metanotal sutures not impressed or distinct..... *Cardiocondyla nuda*(fig. 78)
- 1' Metanotal sutures impressed and distinct.....2
- 2 Propodeal spines small and tuberculate..... *Cardiocondyla venustula* (fig. 79)
- 2' Propodeal spines developed..... *Cardiocondyla wroughtonii* (fig.80)

Species Recorded from Louisiana (three):

Cardiocondyla nuda (Mayr, 1866)

Leptothorax nudus Mayr, 1866

Cardiocondyla nuda var. *minutior* Forel, 1899

Diagnosis (Description based in part on Smith 1944). Very small ants. The head and gaster are darker than the tan brown mesosoma, the legs are yellowish-tan. The gaster is dark brown to black and is darker than the lighter dark brown head. Metanotal sutures not impressed and indistinct dorsally. The propodeal spines are usually short. Species in Louisiana are very similar in morphology to each other, it is suggested that reader refer to MacKay (1995) for the diagnosis of the species. It is similar to *Temnothorax* = (*Leptothorax*), however, *Cardiocondyla* lacks erect hairs on the head and mesosoma.

Natural History An exotic species. Van Pelt (1958) found it along dirt roads, and in xeric hammocks in high grass on the Welaka Reserve in Florida.

Range Florida, Texas, and Louisiana. This is often considered an old world “tramp” species (Smith 1979).

Distribution in Louisiana East Baton Rouge and Orleans Parishes (fig.139).

Label Data E. BATON ROUGE PAR., Baton Rouge, Spanish Town, Insurance lot , 18-Aug-1999, peanut butter vial, L M Hooper (5); ORLEANS PAR., New Orleans, Audubon Zoo, (?)-viii-1999, front of zoo, L.M. Hooper-Bui & A. M. Pranschke (1); New Orleans, Audubon Zoo, 19-viii-1999, pitfall, Behind Ostrich cage, L.M. Hooper-Bui & A. M. Pranschke (1);); New Orleans, Audubon Zoo, 19-viii-1999, pitfall, Primate Staging Area, L.M. Hooper-Bui & A. M. Pranschke (2).

Cardiocondyla venustula Wheeler, 1908

Diagnosis Description based on Smith 1944. Very small ants. The head and gaster a dark brown, darker than the light brown mesosoma and the legs are lighter than the mesosoma. The metanotal sutures impressed and distinct. Propodeal spines reduced; tuberculate. Species in Louisiana are very similar in morphology to each other, it is suggested that reader reads the discretions here and refer to MacKay (1995). It is similar to *Temnothorax* =(Lepothorax) however, *Cardiocondyla* lacks erect hairs on the head and mesosoma.

Natural History An exotic species. Nest in open areas in Florida (Deyrup *et al.* 2000).

Range Florida and Louisiana. This is often considered an old world “tramp” species (Smith 1979).

Distribution in Louisiana Rapides Parish (fig.).

Label Data RAPIDES PAR., Pineville, 9-Jun-1971, foraging, J. C. Moser (10)
STDC/SFRS.

Cardiocondyla wroughtonii (Forel, 1890)

Emeryia wroughtonii Forel, 1890

Cardiocondyla wroughtonii var. *hawaiiensis* (!) Forel, 1899

Cardiocondyla wroughtoni var. *bimaculata* Wheeler, 1929

Diagnosis Description based on Smith 1944. Very small ants. The body is uniform light brown, the appendages lighter than body. The metanotal suture impressed and distinct. The propodeal spines prominent. Species in Louisiana are very similar in morphology to each other, it is suggested that reader reads the descriptions here and refer to MacKay (1995). It is similar to *Leptothorax*, however, *Cardiocondyla* lack erect hairs on the head and mesosoma.

Natural History An exotic species. Found in hollow stems of herbaceous plants in Florida (Deyrup et. al. 2000). Found in turkey-oak stands and infrequently in longleaf-pine flatwoods on the Weleka Reserve in Florida (Van Pelt 1958).

Range Florida and Georgia and Louisiana This is often considered an old world “tramp” species (Smith 1979).

Distribution in Louisiana St. Tammany Parish (fig.).

Label Data ST. TAMMANY PAR., Abita Creek Preserve, 30° 31' 25" N 89° 58' 07" W, ?, FIT/MT, Woods, Longleaf Savanna, wet pine flatwoods, D. Prowell (1) PCOL; Abita Creek Preserve, 30° 31' 25" N 89° 58' 07" W, ?, FIT/MT, Woods, Open, Longleaf Savanna, wet pine flatwoods, D. Prowell (1) PCOL.

Temnothorax Mayr 1861

Generic Diagnosis and Natural History and Natural History Species in this genus used to belong to the genus *Leptothorax*, however based on morphological differences, they have been moved to this revived genus by Bolton (2003). Very small to small ants. This is a diverse genus with numerous complications. The antennae may be composed of either 11 or 12-

segments, often with an apical club. The development of the mesosomal sutures variable. Epinotal spines present. This genus exhibits a great deal of diversity not only in species but also in natural history. For example, some species are polygynous, and other species are social parasites. Some species are predators, others are slave makers. Identification of the species in this genus is simplified if one follows species groups or subgeneric organization.

Generic Distribution > 320 total species (Bolton 1995), 70 nearctic species (Cover pers. com.).

Key to Species Based on MacKay (2000) and Deyrup and Cover (2004).

- 1 Antennae 12 segmented.....2
- 1' Antennae 11 segmented.....3
- 2 Mesosoma impressed at the mesonotum and propodeum, the postpetiole not greatly enlarged in dorsal view..... *Temnothorax pergandei* (fig.82)
- 2' Mesosoma not impressed, the postpetiole extremely enlarged in dorsal view..... *Temnothorax texanus*
- 3 The propodeal spines elongated and curved inwards..... *Temnothorax curvispinosus* (fig. 81)
- 3' The propodeal spines short.....4
- 4 Propodeal spines developed though small, mesosoma with well developed rugose sculpturing..... *Temnothorax bradleyi*
- 4' Propodeal spines reduced to angles or small tubercles, the mesosoma sculpturing not as developed as in *L. bradleyi*..... *Temnothorax schaumii*

Species Recorded from Louisiana (five):

Temnothorax bradleyi (Wheeler, 1913)

Lepothorax (Myrafant) bradleyi Wheeler, 1913

Diagnosis A small, dark brown species. Antenna are 11 segmented. Mesosoma lacking an impression at the junction of the mesonotum and propodeum. Propodeal spines are short. There are numerous longitudinal carinae on the head. It looks very similar to *T. schaumii*, however *T. bradleyi* is more coarsely rugose and the spines are longer (MacKay 2000)

Natural History Deyrup and Cover (2004) note that it can be found in longleaf-pine ecosystems where it nests in pine trees. It has been found in longleaf-pine savanna in the east gulf-coastal plain longleaf-pine forest ecoregions in Louisiana.

Range Georgia South into Florida west to Alabama north to North Carolina (Deyrup and Cover 2004).

Distribution in Louisiana St. Tammany Parish (fig.).

Label Data ST. TAMMANY PAR., Lake Ramsay Preserve WMA, 30° 31' N 90° 10' W, FIT, Longleaf-pine Savannah, D. Colby(1) PCOL.

Temnothorax curvispinosus (Mayr 1866)

Leptothorax (Myrafant) curvispinosus Mayr, 1866

Stenamamma gallarum Patton, 1979

Diagnosis A small yellow to dark orange species. The antenna with 11 segments. Mesosoma lacking an impression at the junction of the mesonotum and propodeum. Propodeal spines are elongate and this character will separate it from the other species in the state.

Natural History Dennis (1938) found *T. curvispinosus* to nest in hollow reeds, under logs, and rocks as well as in puff ball mushrooms and nut shells in Tennessee. In Arkansas, it has been collected from tent caterpillar nest soil and in cotton (Warren and Rouse 1969). Colonies have been found in insect galls as well (Smith 1924a, Cole 1940). In the Smoky Mountains in Tennessee it was found in pine-woodlands, nesting in hollow stems or twigs (Cole

1940). It can be found in hardwood forest in the southern part of the species range (Deyrup and Cover 2004). *Temnothorax curvispinosus* has been collected in mixed flatwoods, pine-mixed upland hardwood forest, mixed-hardwood forest, oak dominated forest with the understory comprised of palmetto and in longleaf-pine flatwoods. It found in the Mississippi River alluvial plain, Tunica loess hills, southeast mixed pine hardwood forest and the east gulf-coastal plain longleaf-pine forest ecoregions.

Range Maine south to Florida west to Arizona north to Iowa (Smith 1979).

Distribution in Louisiana Catahoula, East Baton Rouge, Madison, St. Landry, St. Tammany and West Feliciana Parishes (fig.).

Label Data E. BATON ROUGE PAR., Waddill Outdoor Education Center, 30° 47' N 91° 15' W, [1-Jul-1999 - 31-Mar-2000], Pitfall, Mixed Flatwood, E. J. Watson (10) Watson-LSAM; E. FELICIANA PAR., Clinton, Idlewild Res. Station, 25-May-2004, sifting leaf litter and log material, S. T. Dash & M. A. Seymour (1) STDC; MADISON PAR., Tallulah, Tensas National Wildlife Refuge, 32° 24' N 09° 11' W, 24-May-2004, sifting leaf litter and decaying log material, Mix hardwood, S. T. Dash (2) STDC/LSAM; CATAHOULA PAR., 6 mi W Sicily Island, Sicily Island Hill WMA, 1-May-2003, berlese 2, sifting leaf litter, pine-mixed upland hardwoods, M. A. Seymour & S. T. Dash (1)LSAM; ST. LANDRY PAR., Washington, Thistlewaite WMA, off Rice Rd, 11-Jun-2003, oak dom forest with palmetto, under story sifting leaf litter, S. T. Dash & K. S. O'Brien (2) STDC; ST. TAMMANY PAR., Abita Creek Preserve, 30° 31' 25" N 89° 58' 07" W, FIT/MT, Woods, Longleaf Savanna, wet pine flatwoods, D. Prowell (2) PCOL; W FELICIANA PAR., Feliciana Preserve, 30°47' N 91°15' W, 24-Apr-02-May-2003, FIT trap, A. Tishechkin (1) LSAM; Feliciana Preserve, 30°47' N 91°15' W, 14-Apr-2003, sweeping, S. T.

Dash (1) FAFC; N St. Francisville, Tunica Hills WMA, 31-Jul-1999, sifting leaf litter, upland hardwood, J. L. Johnson & T. D. Fassbender (1) LSAM.

Temnothorax pergandei (Emery, 1865)

Leptothorax pergandei Emery, 1865

Diagnosis A small, normally dark colored species in Louisiana. Antennae 12- segmented. A distinct impression is present at the junction of the mesonotum and the propodeum.

Natural History Deyrup and Cover (2004) comment that it nest in “hollow twigs” and can be found in “open forest or at forest edges.” Dennis (1938) found colonies nesting in a stick in an open oak-hickory habitat. Smith (1924a) noted it was a ground colonizing species.

Temnothorax pergandei has been found in both upland longleaf-pine savannas and longleaf-pine savannas: wet pine flatwoods in Louisiana. It can be found in the east gulf-coastal plain longleaf-pine forest and the west gulf-coastal plain longleaf-pine forest ecoregions of the state.

Range New Jersey south to Florida west to Nebraska and Arizona (Deyrup and Cover 2004).

Distribution in Louisiana Natchitoches and St. Tammany Parishes (fig.).

Label Data NATCHITOCHEs PAR., Kistachie Natl. For Scenic overlook nr pitcher plant bog, 20-Sep-2003, Sweeping, A. R. Cline(1) STDC; ST. TAMMANY PAR., Abita Creek Preserve, 30° 31' 25" N 89° 58' 07" W, FIT/MT, Woods, Longleaf Savanna, wet pine flatwoods, D. Prowell(1) PCOL; Lake Ramsay Preserve WMA, 30° 31' N 90° 10' W, FIT, Longleaf-pine Savannah, D. Colby(13) PCOL.

Temnothorax schaumii (Roger, 1863)

Leptothorax (Myrafant) schaumii Roger, 1863

Diagnosis Description based on MacKay (2000). A very small, dark brown to yellow ant. Antennae are 11-segmented. Head with fine striae. The dorsum of the mesosoma punctate, the propodeal spines reduced to angles or at most small spines.

Natural History Nests located in bark tree and oak galls. Smith (1924) noted this was the most common species of *Leptothorax* in Mississippi. Howard and Oliver (1979) found it foraging arboreally.

Range Pennsylvania south to southern Georgia west into Texas north to Missouri (MacKay 2000).

Distribution in Louisiana Iberville Parish (fig.) (Howard and Oliver 1979).

Comments: I have not collected any specimens during this study nor do there seem to be any in the museum collections visited. Nevertheless MacKay (2000) lists it as occurring in the state.

Temnothorax texanus (Wheeler, 1903)

Leptothorax (Myrafant) texanus Wheeler, 1903

Diagnosis Description based on MacKay (2000). A small, dark brown species. Antennae are 12-segmented. The dorsum of the head mesosoma with distinct rugae. The gaster is smooth. The propodeum with well developed spines. In dorsal view the postpetiole nearly 2 times as wide as petiole.

Natural History Nest can be located in sand and clay soils at the base of grass clumps (Smith 1952 MacKay *et al.* 1988).

Range Michigan south to western Virginia, North and South Carolina, south into Georgia west into Arizona north to Utah.

Comments: I have not collected any specimens during this study nor do there seem to be any in the museum collections visited. Nevertheless MacKay (2000) lists it as occurring in the state.

Myrmecini

Myrmecina Curtis, 1829

Generic Diagnosis and Natural History and Natural History Small monomorphic, light brown to black ants. Antennae are 12-segmented with a three-segmented club. Eyes are small. A lateral carina on the ventral area (gular region) of the head is present. Epinotum with two pairs of spines. The petiole is lacking an anterior peduncle and with a reduced node. The first gastric segment large and occupying most of the gaster (Smith 1947). This widespread genus nests in soil, logs, and under bark. Members of this genus feed on other invertebrates. It may be confused with *Tetramorium* and *Myrmica*, however both have a well-developed anterior peduncle to their petioles (see Generic Diagnosis and Natural History for both aforementioned genera).

Generic Distribution 26 total species (Bolton 1995); three nearctic species (Cover pers. com.)

Species Recorded from Louisiana (one):

Myrmecina americana Emery, 1895(fig.)

Myrmecina latreillei americana Emery, 1895

Myrmecina graminicola texana Wheeler, 1908

Myrmecina graminicola quadrispina Enzmann, 1946

Diagnosis Generic characters will separate it from others in Louisiana. Two species in this genus may be found in Louisiana. There is an undescribed widespread parasitic species of *Myrmecina* that lives with *M. americana* (Cover 2003).

Natural History Van Pelt (1958) found this specie in leaf litter at the Welaka Reserve. In Arkansas, Warren and Rouse (1969) located them in oak-hickory forest in pine logs, and under stones. Dennis (1938) and Cole (1940) found *M. americana* in very moist microhabitats. In Louisiana, it has been found in the following macrohabitats, longleaf-pine savannas, bottomland-hardwood forest, beech-magnolia upland- cypress swamp, mixed flatwoods, upland mixed beech-magnolia forest, upland hardwood and pine and mixed hardwood forest. It has been collect in both open pine savannas and in wooded pine flatwoods on the savannas. *Myrmecina americana* can be found in the following ecoregions: Mississippi River alluvial plain, west gulf-coastal plain longleaf-pine forest, coastal prairie, Tunica loess hills, southwest mixed pine hardwood forest, east gulf-coastal plain longleaf-pine forest. Collection methods such as pitfall traps and sifting leaf litter and log material will produce specimens though I have not collected it in high numbers. It is noted in the literature, Dennis (1938), Hess (1958) and Creighton (1950) that it is found in areas that are very moist, I have collected specimens from a dry upland-pine savanna.

Range Quebec south to Florida west to Colorado and Arizona (Smith 1979).

Distribution in Louisiana Bienville, Calcasieu, Catahoula, East Baton Rouge, Evangeline, and Natchitoches, Rapides, St. Tammany, and West Feliciana.

Label Data BIENVILLE PAR., Lucky 10-Aug-1963, H W Echols (1) SRSS; CALCASIEU PAR., Sam Houston Jones State Park, N 30°19' W 93° 16', 11-Jan-2003, sifting litter, A. R. Cline & S. T. Dash (3) STDC; Sam Houston Jones State Park, 17-Aug-1987, W. MacKay (1) MEM; CATAHOULA PAR., Walter Catahoula NWR, 25-May-2004, sifting, Lowland hardwood Forest, L. A. Womack (2) STDC; Sicily Island, Sicily Island Hill WMA, 1-May-2003, Sifting leaf litter, Loblolly short leaf pine and upland hardwoods, S. T. Dash (1) LSAM; E. BATON ROUGE PAR.,

Baton Rouge, Bluebonnet Swamp, N 30° 22.14' W 91° 06.30' 1-Jul-2003, Sifting log matter, Beech Magnolia upland cypress swamp, S. T. Dash (1) LSAM; Waddill Outdoor Education Center, 30° 47' N 91° 15' W, [1-Jul-1999 - 31-Mar-2000], Pitfall, Mixed Flatwoods, E .J. Watson (2) Watson-LSAM; E. FELICIANA PAR., Clinton, Idlewild Res. Station, 25-May-2004, sifting leaf litter and log material, mixed hardwood forest with pines, S. T. Dash & M. A. Seymour (6) FAFC/LSAM; EVANGELINE PAR., St Landry, Chicot St Park, 19-Feb-2004, hiking trail, under bark, S. T. Dash (2) STDC; St. Landry, Chicot State Park, Hiking trail, 27-Jun-2003, Sifting leaf litter, upland beech magnolia, S. T. Dash (1) LSAM; St. Landry, Chicot State Park, Hiking trail, 27-Jun-2003, sifting leaf litter and fungus, Upland Beech Magnolia, S. T. Dash (1) STDC; MADISON PAR., Tallulah, Tensas National Wildlife Refuge, 32° 24' N 09° 11' W, 24-Mar-2004, sifting leaf litter and decay log, mix hardwood, S. T. Dash (1) STDC; NATCHITOCHES PAR., Kistachie, 20-Jul-2003, sifting, A. R. Cline (1) LSAM; Kistachie Nat For, Kistachie Rang Dist, Red dirt area, 19-Sep-2003-28-Apr-2004, pitfall, Nr. *Atta texana* nest, mix pine woodland, S. T. Dash (1) FAFC; RAPIDES PAR., Pineville, 15-Apr-1997, on hood of white, truck, 7 am, J Moser (3) SRSS; ST. TAMMANY PAR., Abita Creek Preserve, 30° 31' 25" N 89° 58' 07" W, FIT/MT, Woods, Longleaf Savanna, wet pine flatwoods, D. Prowell (5) PCOL; Abita Creek Preserve, 30° 31' 25" N 89° 58' 07" W, FIT/MT, Open, Longleaf Savanna, wet pine flatwoods, D. Prowell (3) PCOL; Lake Ramsay Preserve WMA, 30° 31' N 90° 10' W, Pitfall, Longleaf-pine, Savannah D. Prowell (26) PCOL; Lake Ramsay Preserve WMA, 30° 31' N 90° 10' W, FIT, Longleaf-pine Savannah, D. Colby(3) PCOL; W. FELICIANA PAR., Feliciana Preserve, 30 47' N 91 15' W, 21-Apr-1999, sifting, Mixed pine hardwood forest, J. L. Fassbender (5) LSAM; Feliciana Preserve, 30° 47' N 91° 15' W, 18-Sep-2002, sifting leaf litter, A. R. Cline & A. Tishechkin (1) STDC; N St. Francisville Tunica Hills WMA, 31-Jul-1999, sifting litter, Upland Hardwood, J. Johnson &

T Fassbender (7) STDC; N. St. Francisville, Tunica Hills WMA, 31-Jul-1999, sifting litter upland hardwood, J. L. Johnson & T. D. Fassbender (1) LSAM; St. Francisville, Tunica Hills WMA, 31-Jul-1999, sifting, Upland Hardwood, J. L. Johnson & T. D. Fassbender (3) FAFC; Tunica Hills WMA, 31-Jul-1999, Sifting, Upland Hardwood, J. L. Johnson & T. D. Fassbender, 11 STDC; Feliciana Preserve, 30°47' N 91°15' W, 18-Sep-2002, sifting leaf litter, A. R. Cline & A. Tishechkin (3) STDC; Feliciana Preserve, 30°47' N 91°15' W, 11-May-04-July-2003, Flight Intercept Trap, A. R. Cline & A. Tishechkin (1) STDC; Feliciana Preserve, 30°47' N 91°15' W, 21-Apr-1999, Sifting litter/berlese, Mixed pine hardwood forest, J. L. Fassbender (6) STDC.

Myrmicini

Myrmica Latreille, 1804

Generic Diagnosis and Natural History and Natural History Description based on Smith (1979). Small to medium sized ants. Antennae are twelve-segmented with a three to four segmented club. The eyes are well developed and prominent. Frontal lobes are short, but may cover the antennal insertions. A constriction between the mesoepinotum and the propodeum which is armed with a pair of spines. Sculpturing in head and mesosoma “course regulose or regulose reticulate.” Nests are found in the soil. Species in this genus feed on honey dew from homopterous insects (Smith 1979). This is a holarctic genus, whose species are found only in temperate regions. Smith (1979) notes that no species are found in subtropic or xeric habitats.

Generic Distribution 141 total species (Bolton 1995); 50-75 nearctic species (Cover pers. com.)

Myrmica punctiventris Roger, 1863(fig.)

Diagnosis A medium-sized ant. Color is a dark brown to red brown. Description based on Creighton (1950). The antennal scape is evenly bent at base; the scape surpasses the occipital

border of the head. The frontal lobes cover the antennal fossae. The epinotum abruptly depressed below the level of the rest of the mesosoma. Propodeal spines long, one and half times the distance that separates the spines. Body is highly sculpture, the gaster is punctuate.

Natural History Nest in logs in woodlands (Smith 1979). In Louisiana, it has been found in upland beech magnolia forest, bottomland hardwood forest, and upland-pine forest. *Myrmica punctiventris* has been collected by sifting litter and flight intercept traps. It is found in the tunica loess hills, Mississippi River alluvial plain, and the west gulf-coastal plain longleaf-pine forest ecoregions.

Range Massachusetts south to Georgia west to Nebraska and Arkansas (Smith 1979).

Distribution in Louisiana Evangeline, St. Landry, and West Feliciana Parishes (fig.).

Label Data EVANGELINE PAR., St. Landry, Chicot State Park, Hiking trail, 27-Jun-2003, sifting leaf litter and fungus, Upland Beech Magnolia, S. T. Dash (1) STDC; NATCHITOCHE PAR., Kistachie, 20-Jul-2003, sifting, A.R. Cline (3) STDC; ST. LANDRY PAR., Washington, Thistlewaite WMA off Rice Rd, 11-Jun-2003, Sifting leaf litter, Oak dom forest with Palmetto Understory, S. T. Dash & K. S. O'Brien (1) LSAM; W. FELICIANA PAR., Feliciana Preserve, 30°47' N 91° 15' W, 11-May-04—July-2003, Flight Intercept Trap, A. Tishechkin (1) LSAM.

Pogonomyrmex Mayr, 1868

Generic Diagnosis and Natural History and Natural History There are two subgenera in the nearctic, *Pogonomyrmex* (*Pogonomyrmex*) and (*Ephebomyrmex*) however, the later is restricted to the southwest and is not present in Louisiana. Description based on that from Smith (1947). Medium to very large ants that are brown red in color. Species may be monomorphic or polymorphic species. Antennae are 12-segmented; the four terminal segments are enlarged. The eyes are prominent. The head is large, the mandibles are distinctly dentate. The gula region and

the ventral portions of the buccal region with a psammophore. Mesosomal sutures absent. Epinotum normally armed with spines however, may be absent in some species. The petiole with a distinct anterior peduncle. The meso and metatibial spurs are pectinate. Sculpturing of the head and mesosoma is rugose (the head of *P. bigbendensis* lacks heavy rugose sculpturing (Taber 1998)). The gaster has an oval appearance. Species in this genus can inflict a painful sting.

Generic Distribution 60 total species (Bolton 1995); 25 nearctic species (Cover pers. com.)

Key to Species

- 1 Propodeal spines absent..... *Pogonomyrmex badius* (fig. 84)
- 1' Propodeal spines present.....2
- 2 Antennal scapes fail to surpass the posterior margin of head by an amount greater than the length of the first funicular joint..... *Pogonomyrmex comanche* (fig. 83)
- 2' Antennal scapes surpass the posterior margin of head by an amount greater than the length of the first two funicular joints *Pogonomyrmex barbatus* (fig. 85)

Species Recorded from Louisiana (3)

Pogonomyrmex badius (Latreille, 1802)

Formica badia Latreille, 1802

Myrmica transversa Smith, 1858

Atta crudelis Smith 1858

Myrmica brevipennis Smith, 1858

Diagnosis Description based on Creighton (1950) and Taber (1998). The only polymorphic species of *Pogonomyrmex* in North America (Taber 1998). Medium to very large reddish-brown ants. Propodeal spines are lacking.

Natural History Nests are found in open sandy areas in woodlands or fields. Nests are either single or multiple, they are circular craters or dome-shaped with an entrance hole on the tops (Wheeler 1910, Taber 1998). *Pogonomyrmex badius* is similar to *P. comache* in that neither forage at night. Colonies are found in dry, sandy open areas (Taber 1998). An interesting observation is *Pogonomyrmex badius* may cover their nest with charcoal (Taber 1998), it is thought this conserves territorial chemicals making it easier to spot predators (Gordon 1984). This species was found to respond to the chemical signature of the seeds when foraging; focus foraging effort on only one type of seed (Nickle and Neal 1972).

Range South Carolina south to Florida west to Louisiana, one report from northern New Jersey (Smith 1979, Taber 1998).

Distribution in Louisiana Washington Parish (Martelli et. al. 1974) Taber (1998) designates range extends in the Florida Parishes Washington and St. Tammany (fig.).

Label Data TANGIPAHOA PAR., Amite, 7/17/60, J. Moser (12) SRSS.

Pogonomyrmex barbatus (Smith, 1858)

Myrmica barbata Smith, 1858

Myrmica (Atta) molefaciens Buckley, 1860

Pogonomyrmex barbatus var. *nigrescens* Wheeler, 1902

Diagnosis Description based on Creighton (1950) and Taber (1998). Large red-colored ants. The basal portion of the scapes flared. The clypeal lobes are conspicuous. Body sculpturing rugose lacking any reticulations. The propodeal spines present.

Natural History This is an aggressive species (Taber 1998). The nest is a mound with a scooped-out central top entrance however, mound shape varies over the species' range (Wheeler

1910, Taber 1998). Feeds on different seeds as well as termites and ticks. Found in a variety of habitats from desert to mesic areas (MacKay and MacKay 2002).

Range Louisiana and Arkansas west to Kansas and Arizona (Smith 1979, Taber 1998)

Distribution in Louisiana Taber (1998) depicts the range of *P. barbatus* includes all of the western-most Parishes (fig.).

Comments: *Pogonomyrmex barbatus* has not been collected in this study and is only represented by museum specimens from SRSS, however complete label data was absent.

Pogonomyrmex comanche Wheeler, 1902

Pogonomyrmex occidentalis comanche Wheeler, 1902

Diagnosis Description based on Creighton (1950) and Taber (1998). A large reddish-brown ant. With well-developed spines. Antennal scapes fail to surpass the posterior margin of head by an amount greater than the length of the first funicular joint

Natural History The biology of *Pogonomyrmex comanche* is not well known (Taber 1998). A disjunct population of it occurred in Bienville Parish (Taber 1998, Cook pers. com.). Mounds are crescent or circular craters (Wheeler 1910). This species does not forage at night and closes its nest in the evenings. *Pogonomyrmex comanche* has been recorded to forage on caterpillars, seeds, and *Solenopsis invicta* queens (Taber 1998). Taber (1998) remarks that *P. comanche* found in sandy areas of post oak forest. Cook (pers. com.) notes that it is sensitive to changes in the environment and does not tolerate forested areas. It prefers deep sandy soils in open areas. Taber (1998) discuss that only one record of nuptial flights exists, which was observed by Strandmann (1942).

Range Southern Kansas south to southern Texas, southwest Arkansas (one locality, Warren and Rouse 1969) and a population in north central Louisiana

Distribution in Louisiana Bienville and Rapides Parishes (fig.).

Label Data BIENVILLE PAR., Lucky, March-1963, H. W. Echols (1) SRSS; Lucky 07-01-1967 (16) SRSS; Lucky 7-26-1960, J. Moser (12) SRSS; Lucky, La 7-1-67, J. Moser (3) STDC; 3 mi E. Castor, 3-III-1951 J. Moser (2) SRSS; Castor, III-04-1959, J. Moser (5) STDC; RAPIDES PAR., nr Mendor, Nov-19-1958, John Moser (3) SRSS.

Comments: *Pogonomyrmex comanche* has not been collected in this study and is only represented by museum specimens.

Pheidolini

Aphaenogaster Mayr, 1853

Generic Diagnosis and Natural History and Natural Hisotry Monomorphic, small to large sized ants. This ant has a unique slender appearance. Head length is greater than its width. Antennae 12-segmented and the four last segments are enlarged but do not form a distinct apical club. Promesonotoal and mesoepinotal sutures distinct. Epinotal spines are normally present, a few species lack these spines. The gaster is oval in shape (Smith 1947). This genus has some taxonomic difficulties because of the *fulva-rudis-texana* species complex. This problem has been addressed by Umphrey (1996) who presents a key based on morphometric and karyotypic characters nevertheless, however identification is still problematic. This is a widespread genus, whose members nests in logs, under bark, and in soil.

Generic Distribution 158 total species (Bolton 1995) 40 nearctic species (Smith 1979).

Key to Species From Creighton (1950)

1 Basal portion of the scape with a thin flat lobe that extends some distance.....
.....*Aphaenogaster ashmeadi* (fig.88)

- 1' Basal portion of the scape without such a lobe.....2
- 2 The dorsal surface of the pronotum glossy, with fine sculpturing
.....*Aphaenogaster flemingi* (fig. 89)
- 2' The dorsal surface of the pronotum heavily scupultured.....3
- 3 The frontal lobes with a posteriorly projecting flange.....*Aphaenogaster llamellidens* (fig. 90)
- 3' The frontal lobes lacking a tooth-like flange.....4
- 4 The anterior edge of the mesonotum abruptly rising above the posterior portion of the
pronotum. In face view this “welt” is concave in the middle.....*Aphaenogaste fulva*
- 4' The anterior edge of the mesonotum abruptly rising above the posterior portion of the
pronotum; without any concave welt
.....*Aphaenogaster rudis-texana-fulva* species complex (fig. 91)

I do not feel confident determining species identity in this group. Umphrey (pers. com.) suggest that *A. miamiana*, *A. rudis*, *A. texana*, and *A. carolinensis* occur in Louisiana but use of karotyping of the larvae are need for postive confrimation.

Species Recorded from Louisiana (four)

Aphaenogaster ashmeadi Forel,1886

Diagnosis Description based on Cole 1940, Creighton 1950 and Carroll 1975. The antennal scape with a flattened basal lobe that extends the basal fourth of the scape.

Aphaenogaster treatae is a medium sized species (5mm). Red-brown colored. The head, mesosoma, petiole postpetiole, and basal portion of the gaster subopaque. The gaster is mostly shiny. Propodeal spines are short.

Natural History Colonies are large and can be found under stones in open areas such as

fields and forest edges (Cole 1940) as well as in sand under litter (Van Pelt 1958). Van Pelt (1958) found it in xeric and mesic hammocks, flatwoods, and oak-dominated areas on the Welaka Reserve in Florida. In Louisiana, it has been found in mixed hardwood longleaf-pine savannas and longleaf-pine savannas. *Aphaenogaster ashmeadi* is found in the following ecoregions: east gulf-coastal plain longleaf-pine forest, and west gulf-coastal plain longleaf-pine forest. It has been collected with pitfall and bait vials.

Range North Carolina south to Florida west to Texas and Montana (Smith 1979).

Distribution in Louisiana Natchitoches and Washington Parishes (fig.).

Label Data NATCHITOCHE PAR., Kisatchie Nat. For. Kisatchie Rang Dist. Red Dirt area, 19-Sep-2003-28-Apr-2004, pitfall, nr. Atta texana nest, mix pine woodland, S. T. Dash (3)STDC; WASHINGTON PAR., Bougoula, Bens Creek WMA, 30-Jun-2002, Ant vial , Mixed Hardwood For, K. E. Landry, Plot # 5, Trap #10 (7) FAFC/LSAM.

Aphaenogaster carolinensis Wheeler, 1915

Aphaenogaster texana var. *carolinensis* Wheeler, 1915

Species Diagnosis Part of *rudis-fulva-texana* species complex. Medium sized-ants. Like other species of *Aphaenogaster* in Louisiana, it is reddish-brown. The head is longer than wide; Creighton (1950) and Carroll (1975) stated it is about 1/3 longer than broad. Mesonotum not elevated above the pronotum as in *A. fulva*. The spines on the propodeum are short.

Natural History Nest are found under stones and in rotten logs and stumps (Smith 1918, Dennis 1938, Cole 1958). Smith (1931) found a colony nesting in the soil under logs and under bark and in a pine log in Mississippi. In Louisiana, *A. carolinensis* has been collected in longleaf-pine savanna and in wet flatwoods. It has been collected with pitfall traps, baits, and flight intercept traps.

Range Southern New Jersey south to the Florida panhandle west to Oklahoma and Arkansas (Umphrey 1998).

Distribution in Louisiana Iberia and St. Tammany Parishes (fig.).

Label Data IBERIA PAR., New Iberia, 19-Aug-1987, W. MacKay (2) MEM; ST. TAMMANY PAR., Lake Ramsay Preserve WMA, 30° 31' N 90° 10' W, Pitfall, Longleaf-pine Savannah, D. Colby(2) PCOL.

Comments: For the *rudis-fulva-texana* species complex it is suggested that one refers to Umphrey (1996) and Creighton (1950) using both a satisfactory species identification can be made.

Aphaenogaster flemingi Smith, 1928

Diagnosis A medium sized red-brown ant, in addition to the characters in the key, the antennal scapes surpassing the occipital border and the propodeal spines are thick and well-developed.

Natural History Similar in habitats to other species in this genus.

Range North Carolina south to Florida west to Louisiana, north to Kentucky (Smith 1979).

Distribution in Louisiana A few specimens in LSAM but lack locality data.

Label Data 15-May-1959.

Aphaenogaster fulva Roger, 1963

Diagnosis Description based on Creighton 1950, Umphrey 1996. A mesonotum rising above the pronotum, a welt is formed from this elevation. The antennal scapes are short. The hind femora are long and thin. Propodeal spines long and directed upward. Color is light to dark red-brown.

Natural History Colonies are medium sized (Cole 1958). Nest are found in rotting wood, under bark, under stones, in soil and palmetto roots (Dennis 1938, Van Pelt 1958, Smith, 1969). It feeds on other insects. Both Smith (1969) and Dennis (1938) comment on the wide range of ecological adaptation in *A. fulva*. Dennis (1938) found *A. fulva* from the Mississippi river to the mountains of the Smokys and finds it in dense forest and in open fields. Smith (1924) found *A. fulva* in dense forest in Mississippi. Van Pelt (1958) records *A. fulva* on the Welaka Reserve in Florida in swamps, pine flat woods hydric and xeric hammocks. Warren and Rouse (1969) found *A. fulva* nests under stones and litter, as well as in grape vineyards and fields in Arkansas. In Louisiana, *A. fulva* has been collected from upland longleaf-pine savannas, mixed hardwood-pine forest and off of *Marshalla tenuifolia* in a calcareous prairie. *Aphaenogaster fulva* is found in the northwest mixed pine-hardwood forest and the west gulf-coastal plain longleaf-pine forest ecoregions.

Range Vermont south to Florida west to Nebraska and Colorado (Smith 1979, Umphrey 1996).

Distribution in Louisiana Bossier, Calcasieu and Natchitoches Parishes (fig.).

Label Data BOSSIER PAR., Barksdale AFB, 32° 29' 29" N 93° 35' 07" W, 22-Apr-1996, on *Marshalla tenuifolia* in calcareous prairie, D M Pollock (1) MEM; CALCASIEU PAR., Sam Houston Jones State Park, W MacKay (1) MEM; NATCHITOCHE PAR., Kistachie, 20-Jul-2003, Sifting, A. R. Cline (3) STDC.

Comments: For the *rudis-fulva-texana* species complex it is suggested that one refers to Umphrey (1996) and Creighton (1950) using both a satisfactory species identification can be made.

Aphaenogaster llamellidens Mayr, 1886

Diagnosis The frontal lobes with a posteriorly directed tooth or flange (Creighton 1950) Medium sized species (5mm) that is red-brown or rust. Legs are normally darker than body. Propodeal spines shorter than the basal face of propodeum (Carroll 1975).

Natural History Smith (1928) notes that *A. llamellidens* nests in or in very close proximity to logs. *Aphaenogaster llamellidens* inhabits a range of macrohabitats. It was found in xeric and mesic hammocks on the Welaka Reserve in Florida (Van Pelt 1958). In Arkansas, it has been collected from oak forests and agricultural fields. Cole (1940) found it in hardwood and secondary growth pine forest in the Smoky Mountains. Dennis (1938) remarked that *A. llamellidens* nest in numerous types of forest in Tennessee. In Louisiana, it has been collected under bark of a pine tree in a pine-savanna. It occurs in the southeast mixed pine hardwood forest and west gulf-coastal plain longleaf-pine forest ecoregions.

Range New York south to Florida west to Montana and Texas (Smith 1979).

Distribution in Louisiana East Baton Rouge and Vernon Parishes (fig.).

Label Data E. BATON ROUGE PAR., Baton Rouge, 12-Oct-1956, C. L. Smith (2) LSAM; VERNON PAR., Kisatchie National Forest, 12 mi SE Leesville, 5-Oct-1997, long leaf pine, under bark, A. Tishechkin (1) LSAM.

Pheidole Westwood, 1839

Generic Diagnosis and Natural History and Natural History Having the general form of a “typical” myrmicine ant. *Pheidole* are polymorphic ants, that range in size from very small to large. Minors are slender ants in appearance with the majors larger, with large robust heads. Both castes have 12-segmented antennae with a three-segmented apical club. Propodeal spines are present. The unique “big-headed” majors make this an unmistakable genus in our region.

Generic Distribution > 560 total species (Bolton 1995); 100 nearctic species (Cover pers. com.)

Key to the Species: Refer to Wilson (2003).

Pheidole dentata Mayr, 1886(fig. 92)

Diagnosis Description from Wilson (2003) for the major only. “Color varies over the range. The head with rugoreticulum area next to the antennal fossa. The carina of the frontal lobes mostly limited to the margins. The occipital margin in frontal view deeply concave.”

Natural History It occurs in numerous types of habitats, such as coniferous and deciduous forest, opens areas, and on beaches. Colonies nest in decayed wood material, and also in soil under objects (Wilson 2003). Smith (1918) observed it to storing seeds on which it feeds as well as other insects such as collembola and termites (Smith 1924b, Van Pelt 1958). Van Pelt (1958) found *P. dentata* occurring in hammocks, river swamps, flatwoods on the Weleka Reserve in Florida. Warren and Rouse (1969) found it in orchards, vineyard, fence rows, soybean fields, lawn, and pine and oak forest. Nests were found in leaf litter and under stones. Cole (1930) found large colonies under stones in fields in the Smoky Mountains of Tennessee. In Mississippi Smith (1924b) found *P. dentata* to nest under logs and stones. In Louisiana *P. denata* has been collected from mixed flatwoods, longleaf-pine savanna, wet pine flatwoods, and in a zoological park. Specimens were taken with pitfall, flight intercept, and bait traps. It has been found in the following ecoregions, southeast mixed pine-hardwood, coastal marsh, and east gulf-coastal plain longleaf-pine forest.

Range Maryland south to southern Florida, west to Texas north to Kansas (Wilson 2003).

Distribution in Louisiana East Baton Rouge, Orleans, and St. Tammany Parishes (fig.).

Label Data E. BATON ROUGE PAR., Waddill Outdoor Education Center, 30° 47' N 91° 15' W, [1-Jul-1999 - 31-Mar-2000], Pitfall, Mixed Flatwood, E .J. Watson (891) Watson-LSAM; ORLEANS PAR., New Orleans Audubon Zoo, 19-Sep-1999, behind gorillas, L.M. Hooper-Bui & A. M. Pranschke (6) FAFC; ST. TAMMANY PAR., Abita Creek Preserve, 30° 31' 25" N 89° 58' 07" W, FIT/MT, Woods, Longleaf Savanna, wet pine flatwoods, D. Prowell (11) PCOL; Abita Creek Preserve, 30° 31' 25" N 89° 58' 07" W, Bait, Woods, Longleaf Savanna, wet pine flatwoods, D. Prowell (40) PCOL; Abita Springs, Abita Creek Flatwoods Pres., 22-Jul-1999, A. M. Pranschke (2) FAFC; Lake Ramsay Preserve WMA, 30° 31' N 90° 10' W, Pitfall, Longleaf-pine, Savannah, D. Colby(81) PCOL; Lake Ramsay Preserve WMA, 30° 31' N 90° 10' W, Baits, Longleaf-pine Savannah, D. Colby(61) PCOL; Lake Ramsay Preserve WMA, 30° 31' N 90° 10' W, FIT, Longleaf-pine, Savannah, D. Colby(4) PCOL.

Pheidole dentigula M. R. Smith, 1927

Diagnosis Description from Wilson (2003) for the major only. “The body concolor reddish brown the appendages dark yellow. The frontal lobes and vertex carinulate, the remainder of the head rugoreticulate. The occipital margin deeply concave. The inner teeth of hypostoma prominent.”

Natural History It is found in both mesic and xeric forest, nests are found in the soil or in wood material such as stumps. Cole (1940) found it nesting in the soil and under stones in grassy areas in the Smoky Mountains in Tennessee. Smith (1928a) found a colony of it in the “mucky” soil of a decayed log. Van Pelt (1958) found it nesting under leaf litter or in logs (showing no particularity for either soft or hard wood). In Louisiana, *P. dentigula* has been collected in longleaf-pine savannas with pitfall and bait traps in addition to sifting litter. It is found in the east gulf-coastal plain longleaf-pine forest ecoregion.

Range North Carolina south to southern Florida west to eastern Texas (Wilson 2003).

Distribution in Louisiana St. Tammany Parish (fig.).

Label Data ST. TAMMANY PAR., Lake Ramsay Preserve WMA, 30° 31' N 90° 10' W, Pitfall, Longleaf-pine Savannah, D. Colby(1) PCOL; Lake Ramsay Preserve WMA, 30° 31' N 90° 10' W, FIT, Longleaf-pine Savannah, D. Colby(106) PCOL; W. FELICIANA PAR., Feliciana Preserve, 30°47' N 91° 15' W, 18-Sep-2002, sifting leaf litter, A. R. Cline & A. Tishechkin (3)LSAM.

Pheidole flavens Roger, 1863

Diagnosis Description from Wilson (2003) for only the major. “A dark yellow-colored species. Present yet shallow antennal scrobes. Weak rugoreticulia present mesad to the eyes. Carinulae along the midline of the dorsum of heads. Occipital lobes in frontal view smooth and shiny.”

Natural History Wilson (2003) reports *P. flavens* utilizes numerous microhabitats as nest sites. In Louisiana it has been found in longleaf-pine savannas. *P. flavens* with bait and pitfall traps. It is found in the east gulf-coastal plain longleaf-pine forest ecoregion.

Range Southern Florida (Wilson 2003).

Distribution in Louisiana St. Tammany Parish (fig.).

Label Data ST. TAMMANY PAR., Abita Creek Preserve, 30° 31' 25" N 89° 58' 07" W, FIT/MT, Woods, Longleaf Savanna, wet pine flatwoods, D. Prowell (13) PCOL; Abita Creek Preserve, 30° 31' 25" N 89° 58' 07" W, FIT/MT, Open, Longleaf Savanna, wet pine flatwoods, D. Prowell (17) PCOL; Abita Creek Preserve, 30° 31' 25" N 89° 58' 07" W, Bait, Woods, Longleaf Savanna, wet pine flatwoods, D. Prowell (112) PCOL; Lake Ramsay Preserve WMA, 30° 31' N 90° 10' W, Pitfall, Longleaf-pine Savannah, D. Colby(418) PCOL; Lake Ramsay Preserve WMA, 30° 31' N

90° 10' W, Baits, Longleaf-pine Savannah, D. Colby(1523) PCOL; Lake Ramsay Preserve WMA, 30° 31' N 90° 10' W, FIT, Longleaf-pine Savannah, D. Colby(140) PCOL.

Pheidole floridana Emery, 1895

Diagnosis Description from Wilson (2003) for only the major.” Fovellation on dorsum of head very fine, the first gasteric tergite smooth and shiny. Humeral not prominent in dorsal–oblique view.”

Natural History Nest are found in open areas, as well as in mesic and xeric woodlands that are partly open (Wilson 2003). Howard and Oliver (1979) found it to be shy and only forage on baits when placed near their nest. It as been collected in the coastal marsh and Mississippi River alluvial plain ecoregion.

Range North Carolina south to southern Florida west to Texas (Wilson 2003).

Distribution in Louisiana Iberville (Howard and Oliver 1979), Plaquemines, Terrebonne, and St. Bernard Parishes (fig.).

Label Data PLAQUEMINES PAR., Point Alakache, T. F. McGehee (7) MEM; TERREBONNE PAR., Gibson, 20-Aug-1989, in tree, W. MacKay (1) MEM; (St. Bernard Par.), St. Bernard St. Park, 22-Aug-1987, W. MacKay (1) MEM.

Pheidole metallescens Emery, 1895 (fig. 93)

Diagnosis Description from Wilson (2003) for only the major. “A red-brown ant. The occiput rugoreticulate with reticulum extending partway anteriorly down the side of the head to the eyes. A small area of rugoreticulate occurs between the eyes and antennal fossa.”

Natural History Nest can be located in decaying logs or in the soil in shaded areas (Wilson 2003). Van Pelt (1958) found it in flatwood and xeric habitats such as oak shrub areas on the Weleka Reserve in Florida. In Louisiana, *P. metallescens* has been collected in longleaf-

pine savannas, wet pine flatwoods, and upland mixed-hardwood forest. Specimens were collected with bait, pitfall, flight intercept, and malaise traps.

Range Georgia south through Florida west to Texas and Oklahoma (Wilson 2003).

Distribution in Louisiana St. Tammany Parish (fig.).

Label Data ST. TAMMANY PAR., Abita Creek Preserve, 30° 31' 25" N 89° 58' 07" W, FIT/MT, Woods, Longleaf Savanna, wet pine flatwoods, D. Prowell (56) PCOL; Abita Creek Preserve, 30° 31' 25" N 89° 58' 07" W, FIT/MT, Open, Longleaf Savanna, wet pine flatwoods, D. Prowell (14) PCOL; Abita Creek Preserve, 30° 31' 25" N 89° 58' 07" W, Bait, Woods, Longleaf Savanna, wet pine flatwoods, D. Prowell (260) PCOL, Lake Ramsay Preserve WMA, 30° 31' N 90° 10' W, Pitfall, Longleaf-pine Savannah, D. Colby (26) PCOL; Lake Ramsay Preserve WMA, 30° 31' N 90° 10' W, Baits, Longleaf-pine Savannah, D. Colby (346) PCOL; Lake Ramsay Preserve WMA, 30° 31' N 90° 10' W, FIT, Longleaf-pine Savannah, D. Colby(1) PCOL; EVANGELINE PAR., Vill Platte, Chicot State Park, 27-Jul-2002, Honey trap, M. A. Seymour (6) LSAM; Campti end Hymes Rd, 28-Jul-2002, M. A. Seymour (3) LSAM; TANGIPAHOA PAR., Arcola, Sandy Hollow WMA, 9-Sep-2002, Pitfall trap, Longleaf-pine Savanna, K. E. Landry (2) FAFC.

Pheidole morens Wheeler, 1908(fig. 94)

Diagnosis Description from Wilson (2003) for only the major. "Variable in color, usually a red-brown. The occiput is smooth and shiny, the remainder of the head carinulate, similar to *P. flavens*; *P. moerens* has a larger smooth area on the occiputs and a feebler intercarinular foveolation on the head."

Natural History Diverse in nest sites however, rarely in soil. In Louisiana it has been collected in disturbed areas, urban environments, and oak dominated forest with palmetto understory. Specimens were collected with pitfall and bait traps as well as sifting leaf litter.

Range Georgia, Alabama, and Texas in the United States; Wilson (2003) suggests the native range is the Greater Antilles.

Distribution in Louisiana Calcasieu, East Baton Rouge, St. Landry, and St. Tammany Parishes (fig.).

Label Data CALCASIEU PAR., Nr. Moss Bluff, Sam Houston Jones St. Park, 11-Feb-2002 leaf litter sifting, A. R. Cline & S. T. Dash (4) LSAM; E. BATON ROUGE PAR., Baker Palomino St, Palomino Park, 22-Aug-2002, Vienna Sus Trap, M. A. Seymour (1) FAFC; Baton Rouge, Spanish Town ST-4, 24-Aug-2000, Bait trap: V. sausage, L. M. Hooper (1) FAFC; Baton Rouge, Spanish Town, Docs, 19-Jul-1999, peanut butter, L. M. Hooper (1) FAFC; Baton Rouge, Spanish Town, Belvins, 19-May-1999, L M Hooper (1) FAFC; Waddill Outdoor Education Center, 30° 47' N 91° 15' W, [1-Jul-1999 - 31-Mar-2000], Pitfall, Mixed Flatwood, E.J.Watson (215) Watson-LSAM. ST. LANDRY PAR., Washington, Thistlewaite WMA, off Rice Rd, 11-Jun-2003, Sitting leaf litter, oak dom forest with palmetto under story, S. T. Dash & K. S. O'Brien (1) FAFC; ST. TAMMANY PAR., Abita Springs, Money Hill Golf Course, 8-Sep-2000, pitfall trap, A. M. Pranschke (1) LSAM.

Pheidole tetra Creighton, 1950(fig. 95)

Diagnosis Description from Wilson (2003) for only the major. “Major with abundant pilosity, occiput free of sculpturing the areas between the eyes and antennal fossa rugoreticulate.”

Natural History Found nesting under rocks and in soil in open areas. In Louisiana it has been collected in longleaf-pine savannas with pitfall traps. *Pheidole tetra* occurs in the east gulf-coastal plain longleaf-pine forest.

Range Missouri, Arkansas, Texas, Oklahoma and Arizona (Wilson 2003).

Distribution in Louisiana Tangipahoa Parish (fig.).

Label Data Tangipahoa Par., Arcola, Sandy Hollow WMA, 9-Sep-2002, Pitfall trap, Longleaf-pine Savanna, K. E. Landry (1) LSAM.

Solenopsidini

Monomorium Mayr, 1855

Generic Diagnosis and Natural History and Natural History Very small monomorphic ants. There are two groups in Louisiana, the species belonging *minimum* group and *M. pharaonis*. The *minimum* group are mostly all dark in color. The antennae are 12-segmented in both groups with a three segmented club (Smith 1947). Smith (1947) describes the head as being “noticeably longer than broad “Eyes are well developed. The anterior margin of the clypeus is bicarinate. The propodeal spines are lacking. Most species lack body sculpturing. Superficially, this genus resembles species of *Solenopsis*; nevertheless, *Solenopsis* have ten-segmented antennae with a two segmented club. Species in this genus feed on a diverse and long list of items. Colonies are polygynous. Nests are found in soil, under bark and in logs as well as occasionally in homes (Smith 1947). Some species in this genus such as *M. pharaonis* (L.), *M. destructor* (Jerdon), and *M. minimum* (Buckley) are considered pestiferous (Smith 1965).

Generic Distribution 295 total species (Bolton 1995); 16 nearctic species (Cover pers. com.)

Key to the Species:

1 Color dark brown to black, body free of sculpturing..... *Monomorium minimum* (fig.96)

1' Color yellow to orange never dark brown or black, body with punctate sculpturing

..... *Monomorium pharaonis* (fig. 97)

Species Recorded from Louisiana (2):

Monomorium minimum (Buckley, 1867)

Myrmica (Monomarium) {Sic} minima Buckley, 1867

Monomorium minutum var. *minimum* Emery, 1985

Diagnosis Description based on Dubois (1986). Very small, dark colored ants. The color ranges from dark brown to black often with blue reflections on the body, the legs are tan. The head, mesosoma, and gaster are smooth and shiny. Sculpturing lacking over most of the body, limited rugae on the pleural region of the propodeum and on the lateral sides of the mesopleuron.

Numerous erect and suberect hairs are present over body that are white. It may be confused with minors of *Pheidole* or species of *Solenopsis*. Generic characters of 12-segmented antennae and 3-segmented club will separate it from *Solenopsis*. *Pheidole* have the propodeum armed with spines. The species superficially resembles that of *Temnothorax pergandei*, nevertheless *T. pergandei* processes spines on the propodeum and the confusion can quickly be remedied.

Natural History In Arkansas, *M. minimum* has been collected in golf course, lawns, fields, pastures, and from willow trees (Warren and Rouse 1969). Dennis (1938) found it to nest in stumps, logs, under rocks, and preferring drier habitats in Tennessee. Cole (1940) found *M. minimum* in open habitats in the Smoky Mountains. Smith (1924a) found this species as living in soil, in trees, and in houses in Mississippi. Colonies are large with thousands of workers and multiple queens (Cole 1940, DuBois 1986). It has been collected from the following macrohabitats in Louisiana: hardwood forest, bottomland-hardwood forest, mixed-composite and

grass fields, mixed hardwood-pine forest, oak-dominated forest with a palmetto under story, longleaf-pine savannah and upland mixed-hardwood forest. *Monomorium minimum* can be found in the northwest mixed pine hardwood forest, west gulf-coastal plain longleaf-pine forest, coastal prairie, Mississippi river alluvial plain, tunica loess hills, southeast mixed pine hardwood forest and east gulf-coastal plain longleaf-pine forest ecoregions.

Range Pennsylvania south to Georgia west to New Mexico and North Dakota (DuBois 1986).

Distribution in Louisiana Bienville, Calcasieu, Catahoula, East Baton Rouge, Rapides, St. Landry, St. Tammany, Tangipahoa, West Feliciana, and Washington Parishes (fig.).

Label Data BIENVILLE PAR., Jackson-Bienville WMA, N. Mt. Olive Nr Desdemona, 31° 48' N 92° 35' W, 28-May-2004, sifting, bottomland hardwood forest, S. T. Dash (9) STDC; Lucky, XII-26-1964, H. W. Echols (3) SRSS; Lucky Rt 9, 28-May-2004, sweeping composite and yucca, S. T. Dash (8) STDC; CALCASIEU PAR., Moss Bluff Sam Houston Jones State Park, 16-May-2003, trail in fallen tree (10) LSAM; Sam Houston Jones State Park, 16-May-2003, sifting leaf litter, Hardwood forest, S. T. Dash (2) LSAM; CATAHOULA PAR., 6 mi W Sicily Island, Sicily Island Hill WMA, 1-May-2003, Seeping open field, mixed composit. and grasses, S. T. Dash & M. A. Seymour (7) FAFC; E. BATON ROUGE PAR., Baton Rouge, BREC Highland Rd. Park, Site # 49, 1100, 12-May-2003, Ant Vial Honey, J. L. Rosson (12) LSAM/FAFC; Baton Rouge, 5-Oct-1936, C. L. Smith (3) LSAM; Baton Rouge, 18-Oct-1936, C. L. Smith (2) LSAM; Baton Rouge, 11-Oct-1961, (1) LSAM; GRANT PAR., Kisatchie Nat. Forest, 1 km south Camp Grant Walker, 1-Jun-2004, sweeping, L. A. Womack (1) FAFC; LIVINGSTON PAR., Denham Springs in house, 3-Mar-1999, L. Gautreaux (1) LSAM; ORLEANS PAR., New Orleans Audubon Zoo, 19-Aug-1999, pitfall PF-7, Behind Ostrich cage, L. M. Hooper-Bui & A. M.

Pranschke (1) FAFC; New Orleans Audubon Zoo, 19-Aug-1999, pitfall PF-7, Butterfly House, L. M. Hooper-Bui & A. M. Pranschke (1) LSAM; RAPIDES PAR., Alexandria, 30-May-1960, J. C. Moser (2) SRSS; Woodworth, Alex. ST. For., {*Date range for labels*} 23-Feb-2002—18-Dec-2003, Ant vial, Mixed Hardwood For., K. E. Landry (41) LSAM/FAFC. Alexandria, 0-Jan-1998, R. Constanilius (1) SRSS; Alexandria, on cotton, V-31-1908, E. S. Tucker (1) SRSS; ST. LANDRY PAR., Washington, Thistlewaite, WMA off Rice Rd, 11-Jun-2003, sifting leaf litter, oak dom forest with palmetto under story, S. T. Dash & K. S. O'Brien (3) STDC/LSAM; ST. TAMMANY PAR., Abita Creek Preserve, 30° 31' 25" N 89° 58' 07" W, FIT/MT, Open, Longleaf Savanna, wet pine flatwoods, D. Prowell (5) PCOL; Abita Creek Preserve, 30° 31' 25" N 89° 58' 07" W, Bait, Woods, Longleaf Savanna, wet pine flatwoods, D. Prowell (2) PCOL; Abita Springs, Abita Creek Flatwoods Pres., 22-Jul-1999, A. M. Pranschke (2) FAFC; Lake Ramsay Preserve WMA, 30° 31' N 90° 10' W, Baits, longleaf Pine Savannah, D. Colby (28) PCOL; Mandeville, Fontainebleau St. Park, 20-Mar-2003, in log, along shore line, colony, S. T. Dash (630) STDC/FAFC/LSAM; TANGIPAHOA PAR., Arcola, Sandy Hollow WMA {*Date range for labels*} 19-Apr-200—21-Feb-2003, Ant vial, longleaf Pine Savanna, K. E. Landry (12) WASHINGTON PAR., Bogolusa, Bens Creek WMA, 30-Jun-2002, Ant vial, Mixed Hardwood For., K. E. Landry (3) FAFC; Bogolusa, Bens Creek WMA, 30-Jun-2002, Ant vial, Mixed Hardwood For., K. E. Landry (5) LSAM; W. FELICIANA PAR., Feliciana Preserve, 30° 47' N 91° 15' W, 18-Sep-2002, sifting leaf litter, A.R. Cline and A. Tishechkin . N. St. Francisville, Tunica Hills WMA, 31-Jul-1999, sifting litter, Upland Hardwood, J. L. Johnson & T. D. Fassbender (1) STDC; WINN PAR., 1/2 mi NW Packton on LA 167, 32° 24' N 92° 48' W, 28-May-2004, sweeping road side yucca, S. T. Dash (8) STDC; {Louisiana} 14-Aug-1962, col in pine, J. Impson (1) LSAM; Calvin, M. R. Smith (1) SRSS.

Monomorium pharaonis (Linnaeus, 1758)

Formica pharaonis L, 1758

Diagnosis Very small light colored ants. Coloration is a yellow to a light orange. Similar in overall shape to *M. minimum*. Head and mesosoma not smooth and shiny, rather the head, mesosoma, petiole and postpetiole are punctuate with the gaster lacking heavy sculpturing and is shiny. It may be confused with *Solenopsis (Diplorhoptum)* species, both are yellow and very small, however, *Solenopsis* have a 10-segmented antenna and 2-segmented club. *Monomorium pharaonis* may also be confused with minor workers of *Pheidole* or workers of *Temnothorax*, examination of the propodeum for spines; the lack of spines will separate *Monomorium* from other species.

Natural History An exotic species that is considered to be a pest. A common indoor pest found worldwide (Smith 1965). They have been found living outdoors in Louisiana in a zoological park. It has also been collected in homes and buildings. These ants can form a nest in nearly any crack or hole, with a suitable microclimate (Smith 1965). A condition known as budding occurs when a new colony starts with a few workers and some larvae that eventually becomes a queen from the natal colony, making this a particular difficult pest to control. It feeds on dead insects and also is known to like sweets (Smith 1965).

Range Throughout the cosmopolitan and urban areas of the country (Smith 1979).

Distribution in Louisiana East Baton Rouge, Livingston, Orleans and Rapides Parishes (fig.).

Label Data E. BATON ROUGE PAR., Baton Rouge, 5-Oct-1936, C. L. Smith (3) LSAM; Baton Rouge, 18-Oct-1936, C. L. Smith (2) LSAM; Baton Rouge, 11-Oct-1961 (1)LSAM; LIVINGSTON PAR., Denham Springs in house, 3-Mar-1999, L. Gautreaux (1) LSAM; ORLEANS

PAR., New Orleans Audubon Zoo, 19-Aug-1999, pitfall PF-7, Behind Ostrich cage, L. M. Hooper-Bui & A. M. Pranschke (1) FAFC; New Orleans Audubon Zoo, 19-Aug-1999, pitfall PF-7, Butterfly House, L. M. Hooper-Bui & A. M. Pranschke (1) LSAM; RAPIDES PAR., Alexandria, Jan-1998, R. Constanil (1) SRSS; Alexandria, on cotton V-31-1908, E. S. Tucker (1) SRSS; ?PAR. Flatwoods, 14-Aug-1962, col in pine, J. Impson (1) LSAM.

Solenopsis Westwood, 1840

Generic Diagnosis and Natural History and Natural Hisotry A large and diverse group. Species are polymorphic and monomorphic depending on the subgenus. Species vary in size from very tiny to large (1 to 6mm). Antenna are 10-segmented with a two-segmented club. The epinotum lacks spines. There are three subgenera present in the Nearctic region.

Generic Distribution 195 total species (Bolton 1995); 40 Nearctic species (Cover pers. com.)

Key to the subgenera of *Solenopsis* (based on Creighton 1950).

- 1 Medium to large polymorphic/dimorphic ants, second and third funicular segments longer than broad.....*Solenopsis (Solenopsis)*
- 1' Very small to small monomorphic ants, second and third funicular segments at least as broad as long.....2
- 2 Eyes with more than 15 facets, the postpetiole greatly dilated.....*Solenopsis (Europhthalma)*
- 2' Eyes small with less than 15 facets, postpetiole not greatly expanded laterally.....
.....*Solenopsis (Diphorhoptom)*

Solenopsis (Solenopsis)

Description from Smith (1947) and Creighton (1950). This subgenus includes the *geminata* group. Polymorphic with small to large sized workers. Minor workers make identification

difficult because of their variability, securing majors will make identification more accurate concrete. Anterior border of clypeus is either bicarinate in the native species or tricarinate in the introduced species. Mandibles have few teeth and in *S. geminata* they are absent (from being worn down). The second and often third funicular joints longer than wide (1/2 as long as wide).

Key to Species from Carlton (1987) and Trager (1991).

- 1 Small (2-4 mm) ants, minors.....2
- 1' Larger (4-5 mm) ants, major.....4
- 2 The scape not surpassing the posterior border of the head, the petiole normally with a developed ventral tooth or the petiole peduncle..... *Solenopsis xyloni** (fig. 10)
- 2' The scape surpassing the posterior border of the head, petiolar peduncle lacking a ventral tooth or with a poorly developed.....3
- 3 The anterior border of the clypeus with two lateral and one median tooth (fig.100), the dorsolateral aspect of the mesosoma polished and glossy..... *Solenopsis invicta* (fig. 99)
- 3' The anterior border of the clypeus with two lateral tooth, and lacking a median one, the dorsolateral aspects of mesosoma dull..... *Solenopsis geminata*¹
- 4 Occipital furrow deep, propodeal carinae distinct, petiolar without or with a much reduced process..... *Solenopsis geminata*¹(fig. 98)
- 4' Occipital furrow shallow, not as distinct, propodeal carinae lacking, petiolar ventral process developed as ventral flange.....5
- 5 Anterior border of the clypeus with two lateral and one median tooth, 40-60 pigmented facets..... *Solenopsis invicta*
- 5' Anterior border of the clypeus lacking a median tooth the eye with 70-80 pigmented facets..... *Solenopsis xyloni**

Species Recorded from Louisiana (two):

¹ The question if *S. geminata* has ever been part of the ant fauna in Louisiana is out of the scope of this study. Literature suggests *S. geminata* has not been, no specimens exist from museums visited yet, some literature reviewed by myself to contain individual records from the state.

Trager (1991) questions the existence of this species in the state in his revision.

**Solenopsis xyolni* was historically present in Louisiana, based on museum specimens and earlier studies was a relatively common ant of pastures and open areas. This study did not find any, and specimens are lacking from collections and study reports the last 20 years or more.

Solenopsis geminata (Fabricius, 1804)

Atta geminata Fabricius, 1804

Atta Rufa Jerdon, 1851

Myrmica virulens Smith, 1858

Atta clypeata Smith, 1858

Solenopsis cephalotes Smith, 1858

Crematogaster laboriosus Smith, 1860

Diplorhoptum drewseni Mayr, 1861

Myrmica glaber Smith, 1862

Myrmica polita Smith, 1862

Myrmica (Monomarium (!)) saxicola Buckley, 1867

Atta lincecumii Buckley, 1867

Atta brazoensis Buckley, 1867

Atta colaradensis Buckley, 1867

Solenopsis geminata var *diabola* Wheeler, 1908

Diagnosis Description from Trager (1991). Medium-sized ants. Color very variable over range, normally concolorous orange to orange-red. Posterior border with deep angular median emargination. The teeth of the mandible worn down by milling seeds. Scapes failing to reach pass the occital border. The metanotum impressed obvious, “set off by a ridge at its juncture with the propodeum.” the petiolar peduncle long or slightly longer than the base of the node.

Natural History It is considered a granivore. *Solenopsis geminata* tend to be less aggressive than the other “fire ants” in the region.

Range A widespread species and introduced to many parts of the world. In the United States the range is North Carolina south into Florida west to Texas, Trager (1991) notes *S. geminata* absence in Alabama, Mississippi, and Louisiana. MacGown (2004) cites specimens from Mississippi in the MEM.

Solenopsis invicta (!) Buren, 1972

Diagnosis Polymorphic species of medium to small-sized ants. Color is variable over range but is conserved within a nest; head and mesosoma concolorous yellow-red to a dark brick red, the gaster darker brown to black, with a large light spot on the first tergite. The head with only a shallow concave medial impression. The clypeal with a well-developed median tooth that is half as long as the later teeth. This median tooth may be offset from the midline. The scape surpasses the occipital margin in majors and minors. The metanotal impression conspicuous. The petiolar peduncle notably to slightly shorter than base of node.

Natural History An exotic species from the Paraguay River drainage system in South America (Trager 1991). It is frequently mentioned in the literature that it was introduced into Mobile, Alabama from ship ballast. Trager’s (1991) theory is it was introduced with cattle from northern Argentina. It has been collected in all eight ecoregions (northwest mixed pine-

hardwood, west gulf-coastal plain longleaf-pine forest, southeast mixed pine-hardwood, west gulf-coastal plain longleaf-pine forests, tunica loess hill, Mississippi River alluvial plain, coastal prairie and coastal marsh regions). *Solenopsis invicta* has been collected from every macrohabitats in the state from urban to deep bottomland-hardwood forest with closed canopy. The habitat preference for *S. invicta* is often considered to be in open, disturbed areas (Taber 2000). I have found colonies in the interior of bottomland forest nesting in logs in wet decayed-stage logs that are covered with moss along slow moving streams.

Range Southern Virginia south into Florida, west to New Mexico, with scattered populations in Arizona, Virginia, and California and numerous other countries (Trager 1991, Callcott and Collins 1996).

Distribution in Louisiana I have seen specimens from nearly every parish in the state, Callcott and Collins (1996) reports all of Louisiana was inhabited by it by the early 1970s (fig.)

Label Data ALLEN PAR., Elizabeth, 10-Feb-1967, under bark, white oak dead, L. Pichard (3) SRSS; BIENVILLE PAR., Jackson-Bienville WMA, N. Mt. Olive, 32° 24' N 92° 48' W, 28-May-2004, Nr. Dugdemonia Rd., sifting bottomland hardwood forest, S. T. Dash (8) LSAM; Lucky, 26-Mar-1964, dam. CC seeds, H. W. Echols (3) SRSS; Lucky Rt 9, 29-May-2004, sweeping composite and yucca, S. T. Dash (4) STDC; Lucky Rt 9, 29-May-2004, sifting composite and yucca, S. T. Dash (8) STDC; Lucky Rt 9, 28-May-2004, sweeping composite and yucca, S. T. Dash (1) LSAM; BOSSIER PAR., Bodcau WMA, 19-vii-1994, pitfall with rotten chicken, D.R.Ganaway, V.L.Moseley (1) LSAM; CALCASIEU PAR., Iowa, off Rt 10, 16-May-2003, Sweeping, S T Dash (1) STDC; Nr Moss, Bluff Sam Houston Jones St Park, 32° 24' N 92° 48' W, 19-Feb-2003, under bark of log, S. T. Dash (7) STDC; Nr. Moss Bluff, Sam Houston Jones St. Park, 30° 19' N 93° 16' W, 19-Feb-2003, under bark of log, S. T. Dash (10) LSAM;

CATAHOULA PAR., Sicily Hill WMA, 1-May-2004, by hand at roadside, S. T. Dash, M. A. Seymour (1) LSAM; Walkers-Catahoula NWR, 25-May-2004, Sifting, Lowland hardwood Forest, S.T. Dash & L.A. Womack (9) LSAM; 6 mi W Sicily, Island, Sicily Island Hill WMA, 1-May-2003, Seeping open field, mixed composit. and grasses, S. T. Dash & M. A. Seymour (1) STDC; E. BATON ROUGE PAR., 1.2 mi S. of Central on LA Hwy 3034, 15-Jan-1978, C. B. Barr (2) LSAM; Baker, County Lane, 4-Jun-2003, Sweeping, S. T. Dash (18) FAFC; Baker, Country Lane, 4-Jun-2003, Sweeping trees/shrubs, Seymour site 726, S. T. Dash (142) FAFC; Baton Rouge, 29-Oct-1982, E. G. Riley (5) LSAM; Baton Rouge, 28-Oct-1982, E. G. Riley (2) LSAM; Baton Rouge, Bluebonnet Swamp, N 30 2.14 W91 06.30, 23-Jul-2003, bait traps, Beech Magonia upland cypress swamp, S. T. Dash (1) STDC; Baton Rouge, Burden Research Station, 12-Mar-2004, Sweeping shrubs at woodland edge, S. T. Dash (1) STDC; Baton Rouge, Dutches Dr., 28-Aug-2002, N. Nguyen (3) STDC; Baton Rouge, Spanish Town, {*date range from* } 19-April-1999—17-Apr-2001, Vienna Sausage, Honey, peanut butter trap, L. M. Hooper (440) FAFC; Waddill Outdoor Education Center, 30° 47' N 91° 15' W, [1-Jul-1999 - 31-Mar-2000], Pitfall, Mixed Flatwood, E.J.Watson (4343) Watson-LSAM; E. CARROLL PAR., Transylvania, MS River levee, 32 49" N 09 11' W, 17-Mar-2004, Sweeping veg, S. T. Dash (5) STDC; Transylvania, MS River levee, 32 49" N 09 11' W, 17-Mar-2004, Sweeping veg, S. T. Dash (68) FAFC/STDC; E. FELICIANA PAR., Port Hudson, Port Hudson St. Comm. Area, 4-Jun-2003, Sifting forest leaf litter, S. T. Dash (1) FAFC; GRANT PAR., 5 km south Camp Grant Walker, 1-Jun-2004, sweeping road side composites, S. T. Dash (3) STDC; 5 km south Camp Grant Walker, 1-Jun-2004, sweeping road side composites, S. T. Dash (3) STDC; 5 km south Camp Grant Walker, 1-Jun-2004, sweeping road side composites, S. T. Dash (2) LSAM; 5 km south Camp Grant Walker, 1-Jun-2004, sweeping road side composites, S. T. Dash (2) FAFC;

LIVINGSTON PAR., Denham Springs in house, 27-Apr-1999, L. Gautreaux (1) LSAM; MADISON PAR., Tallulah, Tensas National Wildlife Refuge, 32 24'N 09 11'W 24-Mar-2004, sifting leaf litter and decay log, Mix hardwood, S. T. Dash (89) FAFC; Tallulah, Tensas National Wildlife Refuge, 32° 24' N 09° 11' W, 24-Mar-2004, sifting leaf litter and decaying log, Mix hardwood, S. T. Dash (2) STDC; Tallulah, Tensas National Wildlife Refuge, 32 24'N 09 11'W, 24-Mar-2004, Sifting, S.T. Dash (150) STDC; NATCHITOCHEES PAR., 1 mi NNE Lotus, 15-Aug-20-Sept-2003, Flight Intercept Trap, A. Cline (23) FAFC; 1 mi NNE Lotus, 31 30'N 93 7.5 W, 12-Apr-02-Jul-2003, Flight Intercept Trap, A. R. Cline (2) LSAM; Kisatchie Nat For, Kistachie Rang. Dist. Side Road off FS-345, 14-IX-2002, Sweeping mix field, S. T. Dash (1) LSAM; Kisatchie Nat. For. 1mi NNE of Lotus, 31 30'N 93 7.5 W, 3-19-May-2003, FIT, A. R. Cline (20) STDC; Kisatchie Nat. For. Kisatchie Rang Dis Red Dirt area, 19-Sep-2003-28-Apr-2004, pitfall nr. *Atta texana* nest, mix pine woodland, S. T. Dash (51) FAFC/LSAM; Kisatchie Nat. For. Kisatchie Rang. Dist. Red dirt area, Kisatchie Bayou Cmpgrd, 4-Apr-2004, A. R. Cline & S. T. Dash,(1) FAFC; ORLEANS PAR., Audubon Zoo, ?-iv-1999, L. M. Hooper (300) FAFC; New Orleans, Audubon Zoo, 19-viii-1999, PF-1, Primate Staging Area, L. M. Hooper Bui & A. M. Pranschke (11) FAFC New Orleans, Audubon Zoo, ?-apr-1999, Zoo corals, L. M. Hooper-Bui (880) FAFC; New Orleans, Audubon Zoo, ?-ix-1999, front of zoo, L. M. Hooper Bui & A. M. Pranschke (156) FAFC; New Orleans, Audubon Zoo, 19-viii-1999, Behind Zoo exhibits, L. M. Hooper Bui (136) FAFC; New Orleans, Audubon Zoo, 19-viii-1999, PF-1, Primate Staging Area, L. M. Hooper Bui & A. M. Pranschke (10) FAFC; New Orleans, Audubon Zoo, 7-Sep-1999, back road of zoo, L. M Hooper-Bui (18) FAFC; RAPIDES PAR., Alexandria, 8-Mar-2003, J. C. Moser (1) SRSS; Alexandria Forest Center Pineville, 30-Sep-2003, J. C. Moser (1) SRSS; Woodsworth, Alexander St For. WMA. LADFW educ. Center, 2-Jun-2004, Hg vapor/black lgt,

open field, in pin dom forest, S. T. Dash (1) FCFC; Woodworth, Alex. St. For, {*date range from*} 16-Mar-2002—5-Aug-2003, Ant vials, Mixed Hardwood, K. E. Landry (56)FAFC/LSAM; SABINE PAR., Zwolle N. Toledo Bend St. Park off LA 191, 17-Jun-2003, V.Sausage vials, S.T. Dash (542) LSAM; Zwolle N. Toledo Bend St. Park off LA 191, 17-Jun-2003, V.Sausage vials, S.T.Dash (243) LSAM; Zwolle Sabine WMA, 17-Jun-2003, honey food trap, S.T. Dash (1) LSAM; Zwolle Sabine WMA Off LA 191, 17-Jun-2003, Food Trap, honey, *P. taeda-P. echinata* plantation, S. T. Dash (1) LSAM; Zwolle Sabine WMA Off LA 191, 17-Jun-2003, Vienne Sausage Food, Trap, *P.taeda- P.echinata* plantation, S.T. Dash (4) FAFC; ST. LANDRY PAR., Washington, Thistlewaite WMA off Rice Rd, 11-Jun-2003, Sifting, Oak Dom. Forest with Palmetto Understory, S.T. Dash & K.S. O'Brien (1) STDC; ST. TAMMANY PAR., Abita Creek Preserve, 30° 31' 25" N 89° 58' 07" W, FIT/MT, Woods, Longleaf Savanna, wet pine flatwoods, D. Prowell (104) PCOL; Abita Creek Preserve 30° 31' 25" N 89° 58' 07" W, FIT/MT, Open, Longleaf, Savanna, wet pine flatwoods, D. Prowell (3181) PCOL; Abita Creek Preserve, 30° 31' 25" N 89° 58' 07" W, Bait, Woods, Longleaf Savanna, wet pine flatwoods, D. Prowell (815) PCOL; Abita Creek Preserve, 30° 31' 25" N 89° 58' 07" W, Bait, Open, Longleaf Savanna, wet pine flatwoods, D. Prowell (10434) PCOL; Lake Ramsay Preserve WMA, 30° 31' N 90° 10' W, Pitfall D. Colby (40183) PCOL; Lake Ramsay Preserve WMA, 30° 31' N 90° 10' W, FIT, D. Colby (1797) PCOL; Lake Ramsay Savannah WMA nr. Check station, 20-Mar-2003, Sweeping, S.T. Dash (29) FAFC; Lake Ramsay, Lake Ramsay Savannah WMA, Nr. Check station, 20-Mar-2003, Sweeping Sarracenia pupurea, S. T. Dash (29) FAFC; Mandeville, Fontainebleau St. Park, 20-Mar-2003, Sweeping S. sebiferna, +shrubs, S T Dash (1) LSAM; TANGIPAHOA PAR., Arcola Sandy Hollow WMA, 23-Jun-2004—14-Jul-2004, Vienna Sausage, open, Longleaf Savanna, Li Zou (2654) FAFC; Arcola, Sandy Hollow WMA, 9-Sep-2002—2-Oct-2003, Pitfall

trap, Longleaf Pine Savanna, K. E. Landry (1) FAFC/LSAM; WASHINGTON PAR., Bogalusa, Bens Creek WMA, 9-Mar-2002—21-Sep-2002, Ant vials, Mixed Hardwood, K. E. Landry (652) FAFC; W. FELICIANA PAR., Feliciana Preserve, 30°47' N 91° 15' W, 18-Sep-2002, sifting leaf litter, A. R. Cline & A. Tishechkin (2) LSAM; Feliciana Preserve, 30°47' N 91° 15' W, 15-Apr-2003, flood debris, A. R. Cline & S. T. Dash (4) LSAM; WINN PAR., 1/2 mi NW Packton on LA 167, 31° 48' N 92° 35' W, 28-May-2004, sweeping road side yucca, S. T. Dash (3) STDC.

Solenopsis xyloni McCook, 1879

Diagnosis Medium-sized ants. Color is variable ranging from red-orange to brown red. The clypeus lacking a median tooth. The antennal scapes fails to reach the occipital border by an amount of two times the distal width of the scape. Metanotal impression conspicuous. The petiole with an anteroventral tooth on the peduncle.

Natural History Forms large colonies, in soil, under logs, and rocks, and at times in homes. This is an omnivorous species which feeds on other insects (dead and alive), honey dew, household food items, and plant sap (Smith 1965). Smith (1965) considered it to be one of the worse pest ant species; they cause economic damage from killing poultry, destroying fruits and plants to infesting homes. In Louisiana, this was once a common species and records are common from the 1960s and 1970s in museums and in the literature (Howard et. al. 1979, Baroni Urbani and Kannoowski 1974). However no specimens of it have been found in the course of the current study. Museum material and literature references also are lacking in the past two and half decades.

Range North Carolina south to Florida west to California (Smith 1979). Trager (1991) questions accounts of it occurring in Florida.

Distribution in Louisiana Iberville (Howard *et al.* 1979), Rapides, Tangipahoa (Baroni Urbani and Kanno 1974) and Winn Parishes (fig.).

Label Data RAPIDES PAR., Alex McArthur Dr., 8-Sep-1961, J. C. Moser (2) SRSS; Alexandria, 30-May-1960, lawn, J. C. Moser (1) SRSS; WINN PAR., WinnField, Huey Long Motel, 22-May-1959, J. C. Moser (11) SRSS; Amite, 17-Jul-1960, in stump, J. C. Moser (9)SRSS; {LOUISIANA} TINB3WS4, IX-22-1959, feeding on slash seed, Atta nest, J. C. Moser (13) SRSS.

Solenopsis (Diplorhoptum)

Species in this subgenus are very small to small monomorphic ants. Their eyes are reduced having 15 or fewer facets, normally less than 10. The second and third funicular joints are as broad as long or at most slightly longer than broad (Smith 1947, Creighton 1950). Creighton 1950 stated that North American myrmecologists should consider themselves lucky, because of the lack of species of this problematic subgenus in the nearctic (Thompson 1989). Thompson (1989) discuss the rather problematic habit of identifying all *Solenopsis (Diplorhoptum)* as *S. molesta*.

Key to Species From Thompson (1989), MacKay and MacKay (2002).

- 1 Eyes tiny, nearly absent, the head is elongate with numerous coarse punctures.....2
- 1' Eyes small but visible with a number of ommatida, the head not greatly elongate.....3
- 2 Pronotum with numerous erect hairs of variable length..... *Solenopsis.tennesseensis* (fig.106)
- 2' Pronotum with numerous erect hairs of nearly equal lengths..... *Solenopsis subterranean*
- 3 Petiolar node anterior to the petiolar-postpetiolar juncture, a dark colored species.....
.....*Solenopsis picta* (fig. 105)
- 3' Petiolar node near the petiolar-postpetiolar junction a yellow colored ant.....4

- 4 Postpetiole when view from above circular..... *Solenopsis pergandei* (fig. 104)
- 4' Postpetiole when view from above not circular, oval in appearance.....5
- 5 Antennal segments 3-8 longer than the greatest distance between lobes of the frontal
carinae..... *Solenopsis molesta* (fig.103)
- 5' Antennal segments 3-8 nearly equal or shorter than the distance between frontal
carinae..... *Solenopsis carolinensis* (fig.102)

Species Recorded from Louisiana(six)

Solenopsis carolinensis Forel, 1901

Solenopsis tenana race *carolinensis* Forel, 1901

Diagnosis Description from Thompson (1989). Very small, light yellow to brown-yellow ants. Eyes circular and not reduced. The promesoplural suture below the spiracle. The mesosoma in lateral view with flattened area before and after the metanotal groove head uniformly covered with punctures and hairs.

Natural History Smith (1979) suggests it may be lestopibiotic. In Louisiana, it has been collected with pitfall, bait, and flight intercept traps in longleaf-pine savannas, in the east gulf-coastal plain longleaf-pine forest ecoregion.

Range Massachusetts south to Florida (Smith 1979) west to Louisiana.

Distribution in Louisiana St. Tammany Parish (fig.).

Label Data ST. TAMMANY PAR., Abita Creek Preserve, 30° 31' 25" N 89° 58' 07"

W,FIT/MT, Woods, Longleaf Savanna, wet pine flatwoods, D. Prowell (4) PCOL: Abita Creek Preserve, 30° 31' 25" N 89° 58' 07" W, FIT/MT, Open, Longleaf Savanna, wet pine flatwoods, D. Prowell (63)PCOL: Abita Creek Preserve, 30° 31' 25" N 89° 58' 07" W, Bait, Woods, Longleaf

Savanna, wet pine flatwoods, D. Prowell (2)PCOL: Lake Ramsay Preserve WMA ,30° 31' N 90° 10' W, Pitfall, Longleaf Pine Savannah, D. Colby(4) PCOL: Lake Ramsay Preserve WMA, 30° 31' N 90° 10' W, baits, Longleaf Pine Savannah, D. Colby (173) PCOL: Lake Ramsay Preserve WMA, 30° 31' N 90° 10' W, FIT, Longleaf Pine Savannah, D. Colby (42) PCOL.

Solenopsis molesta (Say, 1836)

Myrmica molesta Say, 1836

Myrmica minuta Say, 1836

Myrmica (Tetramorium (!)) exigua Buckley, 1867

Solenopsis debilis Mayr, 1886

Solenopsis molesta var. *validiuscula* Emery, 1895

Diagnosis Description from Creighton (1950). Small yellow ants. Other species in this subgenus are often misidentified as *S. molesta* (Thompson 1989). Punctures on the head not greater than the diameter of the hairs that arise from them. Antennal segments 3-8 only slightly longer than the frontal carinae.

Natural History It is considered to be lestopibiotic (Smith 1979). Nest can be found in the soil, under stones, wood, and other such objects (Smith 1965). Cole (1940) found it in dry grassy areas in addition to moist forest in the Smoky Mountains in Tennessee. It omnivorous and predaceous feeding on other insects and the larvae and pupae of other ant species (Smith 1924b), and is often considered a household pest (Smith 1965). In Louisiana, it is collected with pitfall traps.

Range Ontario south to Florida west to Washington and California (Smith 1979).

Distribution in Louisiana East Baton Rouge and Bienville Parishes (fig.).

Label Data BIENVILLE PAR., Lucky, III-26-1964, dam. CC seeds H. W. Echols (3) SRSS; Lucky, V-23-1963, H. W. Echols (213) SRSS; E. BATON ROUGE PAR., Waddill Outdoor Education Center, 30° 47' N 91° 15' W, [1-Jul-1999 - 31-Mar-2000], Pitfall, Mixed Flatwood, E. J. Watson (677) Watson-LSAM.

Solenopsis pergandei Forel, 1901

Diagnosis Description from Thompson (1989). Small ant, though a large species for the subgenus. Yellow in coloration. Eyes normal and not reduced. Head appearing squarish in shape. Hairs on the head arise from punctures, these hairs are aligned in rows from side to front. The postpetiole circular in shape.

Natural History Nests are found in soil, decaying wood and in close proximity to other ant colonies.

Range Virginia south to Florida west to Louisiana.

Distribution in Louisiana A specimen (SRSS) collected by Smith.

Label Data {LOUISIANA} Calvin, Summer 1960, M. R. Smith (1) SRSS.

Solenopsis picta Emery, 1895

Diagnosis Description from Thompson (1989). Uniformly dark brown ant, never light pale yellow. Characters in key and color will separate it from all other *Solenopsis* species in the state.

Natural History An arboreal species, nest are found in hollow plant cavities. Van Pelt (1958) found *S. picta* nesting in twigs, galls and fallen logs, showing a preference for broad leaf trees over pines in the Weleka Reserve. In Louisiana, it has been collected in longleaf-pine savanna, in wet flatwoods habitats. It has been collected with flight intercept and malaise traps. I

surmise that sweeping would be productive as well. *Solenopsis picta* is found in the east gulf-coastal plain longleaf-pine forest.

Range South Carolina south into Florida west to Texas (Smith 1979).

Distribution in Louisiana St. Tammany Parish (fig.).

Label Data BOSSIER PAR., Barksdale AFB, 32 29' 29" N 93 35' 07" W, 22-Apr-1996, on Marshalla tenuifolia, in calcareous prairie D M Pollock (7) MEM; ST. TAMMANY PAR., Abita Creek Preserve, 30° 31' 25" N 89° 58' 07" W, FIT/MT, Woods, Longleaf Savanna, wet pine flatwoods, D. Prowell (20) PCOL; Abita Creek Preserve, 30° 31' 25" N 89° 58' 07" W, FIT/MT, Open, Longleaf Savanna, wet pine flatwoods, D. Prowell (5) PCOL; Lake Ramsay PreserveWMA, 30° 31' N 90° 10' W, FIT, D. Colby (164) PCOL.

Solenopsis tennesseensis Smith, 1951

Diagnosis Description from Thompson (1989). Considered very small within the subgenus. The eye is reduced, having the same color as the head or at the most only slightly darker than head. The head is elongate, with a median longitudinal furrow that is free of punctures and hairs.

Natural History In Louisiana it has been found in longleaf-pine savanna, and flatwood habitats. It has been collected with pitfall traps.

Range Florida west to Texas, Kansas, and California (Smith 1979).

Distribution in Louisiana St. Tammany Parish (fig.).

Label Data ST. TAMMANY PAR., Abita Springs, Abita Creek Flatwoods Pres., 6-Jun-2000, pitfall trap, A. M. Pranschke (2) FAFC; Abita Springs, Abita Creek Flatwoods Pres., 14-Jun-2000, pitfall trap, A. M. Pranschke(1) FAFC; Abita Springs, Abita Creek Flatwoods Pres.,

21-Jun-2000, pitfall trap, A. M. Pranschke (1) FAFC; Abita Springs, Abita Creek Flatwoods Pres., 5-Jul-2000, pitfall trap, A. M. Pranschke (2) FAFC.

Solenopsis (Europhthalma)

This subgenus is represented in the Nearctic by one species *S. globularia*. It can be distinguished from other *Solenopsis* species by the extremely broad postpetiole.

Solenopsis (Europhthalma) globularia littoralis Creighton 1930 (fig.107)

Species Diagnosis Subgeneric characters will separate it from all other *Solenopsis* species within the State.

Natural History Creighton (1950) only collected it along beaches. Nest are often found in logs (Smith 1979).

Range North Carolina south to Florida west to Louisiana (Smith 1979).

Distribution in Louisiana It is cited as occurring here by Smith (1979) and Moser and Blum (1960) but no specimens were found at SRSS.

Tetramoriini

Tetramorium Mayr, 1855

Generic Diagnosis and Natural History and Natural History Description based on Smith (1947) and Bolton (1979). Small to medium sized monomorphic ants. Antennae 12 or 11-segmented with an apical club composed of three segments. Eyes well developed. The defining diagnostic character for the genus is a pit into which the antennal insertions arise. This pit is formed from a raised ridge arising from the posterior border of the clypeus. Propodeal spines are present. Both the head and mesosoma with well-developed sculpturing, which may be rugose, or seticulate in form. Of the eight species in North America only two are thought of as being

native. Species are often considered to be pestiferous. Members of this genus are omnivorous feeding on other arthropods, honeydew, nuts, grease, and plant juices (Smith 1965).

Generic Distribution 415 total species (Bolton 1995); eight nearctic species (Bolton 1979).

Species Recorded from Louisiana (one):

Tetramorium bicarinatum (Nylander, 1846) (fig.108)

Myrmica bicarinata Nylander, 1846

Diagnosis This is the only species in this genus to occur in Louisiana. It was introduced into the new world from southeast Asia (Bolton 1979). Description is based on Bolton (1979). A small, yellow brown with gaster is darker than the head and mesosoma species. Antennae are 12-segmented. The mandible sculptured with longitudinally striae. The head with strongly developed frontal carinae, the dorsal area of the head with course rugoreticulation. Body heavily sculptured, the petiole is roughly rectangular. It has been misidentified as *T. guineense* in the United States (by Forel 1891) Bolton (1979).

Natural History An exotic species that in cooler climates, it survives by nesting in greenhouses, homes, and botanical gardens (Smith 1965, Bolton 1979). Nests in wood, hollow stems, and under loose bark. Often found in wet areas (Deyrup *et al.* 2000). In Louisiana, it has been only collected in urban habitats such as a zoological park, yards and in homes. Van Pelt (1958) collected it from the stems of plants and fallen logs on the Welaka Reserve in Florida. Deyrup *et al.* (2000) noted that in Florida it was “not particularly associated with disturbed habitats.”

Range Widely distributed in the US it has been found in Georgia west to Texas, it has been found in New York, Ohio, Illinois, West Virginia, Wisconsin and California (Bolton 1979).

Distribution in Louisiana East Baton Rouge, Orleans and Rapides Parishes (fig.).

Label Data E. BATON ROUGE PAR., Baton Rouge Spanish Town, 19-May-1999-22-Aug-1999, L. M. Hooper (32); E. Baton Rouge, Baton Rouge, Dutches Dr, 28-Aug-2002, N. Nguyen (2) STDC; ORLEANS PAR., New Orleans, Audubon Zoo (localities at zoo: Behind Ostrich cage, behind zoo exhibits, Primate Staging Area, front of zoo, Gorilla Cage, Bird house hill) 19-Aug-1999, pitfall, L.M. Hooper-Bui & A. M. Pranschke (22) STDC/LSAM/FAFC; New Orleans, Audubon Zoo, 6-Oct-1999, PF-5 (pitfall), Fallen log by bird house, L.M. Hooper-Bui & A. M. Pranschke (2) FAFC; RAPIDES PAR., Alexandria, 25-Sep-1960, house, J. C. Moser (1) SFRS.

Comments: *Tetramorium caespitum* is introduced and widespread in numerous areas in the US and it may be found here.



Fig. 53 *Atta texana*



Fig. 54 *Cyphomyrmex rimosus*



Fig. 55 *Mycetosoritis hartmanni*



Fig. 56 *Trachymyrmex septentrionalis*



Fig. 57 *Crematogaster ashmeadi*



Fig. 58 *C. cerasi*



Fig. 59 *C. pilosa*



Fig. 60 *C. lineolata*



Fig. 61 *C. vermiculata*



Fig. 62 *C. missouriensis*



Fig. 63 *Pyramica angulata*



Fig. 64 *P. carolinensis*



Fig. 65 *P. clypeata*



Fig. 66 *P. dietrichi*



Fig. 67 *P. hexamera*



Fig. 68 *P. hyalina*



Fig. 69 *P. margaritae*



Fig. 70 *P. membranifera*



Fig. 71 *P. metaxytes*



Fig 72 *P. ohioensis*



Fig. 73 *P. ornata*



Fig. 74 *P. reflexa*



Fig. 75 *P. rostrata*



Fig. 76 *P. talpa*



Fig. 77 *Strumigenys louisianea*



Fig 78 *Cardiocondyla nuda*



Fig. 79 *C. venustula*



Fig. 80 *C. wroughtonii*



Fig. 81 *Temnothorax curvispinosus*



Fig. 82 *T. pergandei*



Fig. 83 *Pogonomyrmex comanche*



Fig. 84 *Pogonomyrmex badius*



Fig. 85 *Pogonomyrmex barbatus*



Fig. 86 *Myrmecina americana*



Fig. 87 *Myrmica punctiventris*



Fig. 88 *Apheanogaster ashmeadi*



Fig. 89 *A. flemingi*



Fig. 90 *A. lamellinensis*



Fig. 91 *A. texana*



Fig. 92 *Pheidole dentata*



Fig. 93 *P. metallescens*



Fig 94 *P. morens*



Fig. 95 *Pheidole tetra*



Fig. 96 *Momomorium minimum*



Fig. 97 *M. pharaonis*



Fig. 98 *Solenopsis geminata*



Fig. 99 *S. invicta*



Fig. 100 *S. invicta* head full face view



Fig 101 *S. xyloni*



Fig. 102 *S. carolinensis*



Fig. 103 *S. molesta*



Fig. 104 *S. pergandei*



Fig. 105 *S. picta*



Fig. 106 *S. tennesseensis*



Fig. 107 *S. globularia*



Fig. 108 *Tetramorium bicarinatum*



Fig. 109 Collection localities for
Atta texana



Fig. 110 Collection localities for
Cyphomyrmex rimosus



Fig. 111 Collection localities for
Mycetosoritis hartmanni



Fig. 112 Collection localities for
Trachymyrmex septentrionalis



Fig. 113 Collection localities for
Crematogaster ashmeadi



Fig. 114 Collection localities for
Crematogaster atkinsoni



Fig. 115 Collection localities for
C. cerasi



Fig. 116 Collection localities for
C. lineolata



Fig. 117 Collection localities for
C. pilosa



Fig. 118 Collection localities for
C. vermiculata



Fig. 119 Collection localities for
C. missouriensis



Fig. 120 Collection localities for
Pyramica angulata



Fig. 121 Collection localities for
P. bunki



Fig. 123 Collection localities for
P. carolinensis



Fig. 124 Collection localities for
P. clypeata



Fig. 125 Collection localities for
P. dietrichi



Fig. 109 Collection localities for
P. heamera



Fig. 109 Collection localities for
P. hyalina



Fig. 127 Collection localities for
P. margaritae



Fig. 128 Collection localities for
P. membranifera



Fig. 129 Collection localities for
P. metaxytes



Fig. 130 Collection localities for
P. ohioensis



Fig. 131 Collection localities for
P. ornata



Fig. 132 Collection localities for
P. pillinasis



Fig. 133 Collection localities for
P. pulchella



Fig. 134 Collection localities for
P. reflexa



Fig. 135 Collection localities for
P. rostrata



Fig. 136 Collection localities for
P. talpa



Fig. 137 Collection localities for
Strumigenys louisianae



Fig. 138 Collection localities for
S. silvestrii



Fig. 139 Collection localities for *Cardiocondyla nuda*



Fig. 140 Collection localities for *C. venustula*



Fig. 141 Collection localities for *C. wroughtonii*



Fig. 142 Collection localities for *Temnothorax bradleyi*



Fig. 143 Collection localities for *T. curvispinosus*



Fig. 144 Collection localities for *T. pergandei*



Fig. 145 Collection localities for
T. schaumii



Fig. 146 Collection localities for
T. texanus



Fig. 147 Collection localities for
Myrmecina americana



Fig. 148 Collection localities for
Myrmica punctitventris



Fig. 149 Collection localities for
Pogonomyrmex comanche



Fig. 150 Collection localities for
P. badius



Fig. 151 Collection localities for
P. barbatus



Fig. 152 Collection localities for
Aphaenogaster ashmeandi



Fig. 153 Collection localities for
A. carolinensis



Fig. 154 Collection localities for
A. flemingi



Fig. 155 Collection localities for
A. fulva



Fig. 156 Collection localities for
A. lamellidens



Fig. 157 Collection localities for
Pheidole dentata



Fig. 158 Collection localities for
P. dentigula



Fig. 159 Collection localities for
P. flavens



Fig. 160 Collection localities for
P. floridana



Fig. 161 Collection localities for
P. metallescens



Fig. 162 Collection localities for
P. morens



Fig. 163 Collection localities for
P. tetra



Fig. 164 Collection localities for
Monomorium minimum



Fig. 165 Collection localities for
M. pharaonis



Fig. 166 Collection localities for
Solenopsis invicta



Fig. 167 Collection localities for
S. xyloni



Fig. 168 Collection localities for
S. carolinensis



Fig. 170 Collection localities for
S. molesta



Fig. 171 Collection localities for
S. pergandei



Fig. 172 Collection localities for
S. picta



Fig. 173 Collection localities for
S. subterranea



Fig. 174 Collection localities for
S. tennesseensis



Fig. 175 Collection localities for
S. globularia



Fig. 176 Collection localities for
Tetramorium bicarinatum

Dolichoderinae

Key to the Genera of Dolichoderinae in Louisiana: Based on Creighton (1950).

- 1 The declivous face of the propodeum concave, the propodeum is distinctly sculptured
.....*Dolichoderus*
- 1' Declivous face of the propodeum not concave as above and lacking distinct
sculptured.....2
- 2 The propodeum with a cone or tooth-like dorsal protuberance.....*Dorymyrmex*
- 2' The propodeum lacking such a protuberance.....3
- 3 The mesosoma with numerous erect hairs, the hairs on the anterior border of the clypeus long
and distinct*Forelius*
- 3' The mesosoma lacking any erect hairs, pubescence is appressed, the hairs on the clypeus
short.....4
- 4 Petiolar scale not developed and vestigial*Tapinoma*
- 4' Petiolar scale is well developed*Lepithema humile* (fig.182)

Dolichoderini

Dolichoderus Lund, 1831

Generic Diagnosis and Natural History and Natural Hisotry Small to medium sized ants. Eyes well developed; lacking ocelli. Antenna are 12-segmented and lacking an apical club. Mesoepinotal constriction strong. Declivous face of the epinotum strongly concave, appearing C-shaped. The integument is stiff and possesses sculpturing which is an uncommon character for the Dolichoderines. The petiole is scale-like and obvious (Smith 1949). Colonies are found at the base of plants, in the soil, and in hollow cavities of plants. Members of this genus feed on honeydew produced by homopterous insects; these ants also feed on other arthropods. Species in

the genus are noted for having a pungent aroma (Smith 1979, Smith 1949). This genus can be confused with minor workers of the Formicinae genus *Camponotus (Colobopsis)*. This confusion can be compounded by the fact that some species such as *C. impressus* and *D. pustulatus* have been found to be sharing the same nesting site (Johnson 1989).

Generic Distribution 138 total species (Bolton 1995); four nearctic species (Johnson 1989).

Key to the Species: This key is modified from Johnson (1989).

- 1 A concolorous ant, with distinct sculpturing on the mesonotum and propodeum in dorsal view..... *tashenbergi* (fig.178)
- 1' A red and black bicolored species, lacking distinct sculpturing on the mesonotum, only faint sculpturing on the propodeum.....*mariae* (fig.177)

Species Recorded from Louisiana (two):

Dolichoderus mariae Forel, 1884

Dolichoderus mariae davisii Wheeler, 1905

Dolichoderus (Hypoclinae) mariae var. *blatchleyi* Wheeler, 1917

Diagnosis A bicolored species, head, mesosoma and petiole orange-red. The gaster is brown to black. The head pronotum and mesonotum weakly sculptured. Head and mesosoma lacking erect pilosity. The propodeum has a distinct sculpturing. Johnson (1989) characterized it as “as a network of ridges that enclose shallow polygonal depressions.”

Natural History It tends to nest in the soil under grass tussocks (Smith 1918) and shrubs however, nesting sites are variable over the species range (Smith 1924, Johnson 1989). It forms very large colonies (Cole 1940). *Dolichoderus mariae* feed on arthropods and honeydew from homopterous insects such as aphids (Smith 1924). Collections from this study suggest that

it occurs in habitats that are dominated by pine species. It was found in the southeast mixed pine-hardwood forest and the west gulf coastal plain longleaf pine forest ecoregions. This was also found by Warren and Rouse (1969) for the species in Arkansas. Smith (1937) commented on the rarity of it in the vicinity of Baton Rouge. Specimens have been collected by sweeping shrubs and trees.

Range Massachusetts south to Georgia west to Minnesota and Louisiana. Johnson (1989) found that local populations are spotty and believes those previous records from Louisiana are questionable.

Distribution in Louisiana E. Baton Rouge and Rapides Parishes (fig.185).

Label Data E. BATON ROUGE PAR., Baker, Country Lane, 4-Jun-2003, Sweeping tree shrubs, S. T. Dash, Seymour Study Site 726 (3) STDC/LSAM: RAPIDES PAR., T2NR3419, 11-May-1960, J Moser, milling Pine tip aphid (22) SFRS.

Comments: For further reading on taxonomy and nesting sites see Johnson (1989)

Dolichoderus taschenbergi (Mayr, 1866)

Hypoclinae taschenbergi Mayr, 1866

Dolichoderus taschenbergi var. *gagates* Wheeler, 1905

Dolichoderus (Hypoclinae) taschenbergi var. *aterrimus*

Wheeler, 1915

Dolichoderus tachenbergi var. *wheeleriella* Forel, 1916

Species Diagnosis A concolorous ant, dark brown and black. The head and pronotum with fine granulation. The sculpturing is more distinct on the mesonotum and propodeum.

Johnson (1989) characterizes it as “strongly developed granulation” with “longitudinal

striations.” The petiole and gaster are smooth. A number of erect hairs are present on the head and on the anterior portion of the pronotum.

Natural History *Dolichoderus taschenbergi* form large colonies with thousands of workers. Nests are found in the soil in wooded habitats. Smith (1924) found large colonies at Mississippi A.M. College with thousands of workers. Large colonies were also located by Cole (1940) in the Smoky Mountains. The nest is a mound of thatch (Johnson 1989), often at the base of broom straw (Smith 1918). One nest in Louisiana were found next to a long leaf pine. Nest morphology is variable over the species range but with consistency in selection of nest sites (Johnson 1989). The habitats of *D. taschenbergi* are similar to *D. mariae* (Smith 1924). *Dolichoderus taschenbergi* can be found in the west gulf coastal plain longleaf pine forest ecoregion.

Range Nova Scotia south to South Carolina west to Louisiana. Johnson (1989) noted he was not aware of any Louisiana records.

Distribution in Louisiana Rapides Parish (fig. 186).

Label Data RAPIDES PAR., Longleaf tract 1 mile south Glenmora, 4-Mar-1984, thatched nest next to *Pinus palustris*, J. Moser SFRS (3).

Comments: For further reading on taxonomy and nesting sites see Johnson 1989.

Dorymyrmex Mayr, 1866

Generic Diagnosis and Natural History and Natural Hisotry Small monomorphic ants. The integument is thin and flexible. Antenna are 12-segmented lacking an apical club. Eyes are located toward the midline; ocelli lacking. “Epinotum with a tuberculate elevation” (Smith 1949) that is a pyramid-like or cone-shaped structure. This character state will separate *Dorymyrmex* species from all other dolichoderines in Louisiana. A small or vestigial

psammophore is present. The third maxillary palp is as long as the fourth and fifth palp combined. The thoracic sutures are apparent (Smith 1949). Colonies are located in dry open areas. Nests are located in the soil and often the species create crater-like mounds. The species are predatory. Like the other genera of Dolichoderines, they emit an unpleasant smell.

Generic Distribution 48 total species (Bolton 1995); 14 nearctic species (Snelling 1995)

Key to Species Snelling (1995)

1 Mesonotal profile evenly convex or flat to weakly concave..... *Dorymyrmex bureni* (fig. 179)

1' Mesonotal profile angular, declivitous and basal faces are distinct.....

..... *Dorymyrmex grandulus* (fig.180)

Species recorded from Louisiana (two):

Dorymyrmex bureni (Trager, 1995)

Conomyrma edeni Tryon, 1986 (*nomen nudum*)

Conomyrma bureni Trager, 1988

Conomyrma flava Johnson, 1989

Diagnosis Description from Trager (1988). Small ants with variable coloration; specimens can range from yellow, orange-yellow to brown. Head and posterior parts of gaster often darker than the body. Workers with a shiny appearance. In profile, the mesonotum evenly convex, that is lacking a distinct basal and declivous face. Over all the entire mesosoma with a convex profile. Head usually broader than long (Cephalic index = >97). The antennal scapes are short and only surpasses the occipital margin by a third of their length. It is very similar to *D. flavopectus*, the two species can be separated by the shorter scapes (scape index = > 112) of *D. bureni* (*D. flavopectus* scape index = <112) in addition to the coloration of *D. flavopectus* which is a yellow mesosoma, with a darker brown head and gaster.

Natural History It is found in areas where sandy soils dominate. Trager (1988) found it nesting in fields, lawns, road sides, around ponds, and coastal dunes in Florida. *D. bureni* can be found foraging nearly all day; feeding on small arthropods (Trager 1988). Data from this study suggest that it can be found longleaf pine-savannas in the east gulf coastal plain longleaf pine forest ecoregion. Specimens can be reliably collected with pitfall traps as well as baits.

Range Maryland south to Florida west to Texas (Trager 1988, Snelling 1995). Snelling (1995) mentions he has specimens from Louisiana.

Distribution in Louisiana St. Tammany and Tangipahoa Parishes (fig. 187).

Label Data ST. TAMMAMY PAR., Abita Springs, Abita Creek Flatwoods Pres. 22-Jul-1999, A. M. Pranschke (2)FAFC; TANGIPAHOA PAR., Arcola, Sandy Hollow WMA, 9-Sep-2002, pitfall, Longleaf Pine Savanna, K. E. Landry (6) LSAM/FAFC; Arcola, Sandy Hollow WMA DATE 19-Apr-2002-21-Oct-2003, ant vial, Longleaf Pine Savanna, K. E. Landry (17) LSAM/STDC.

Comments: This is a complicated genus, and is need of a thorough revision. For further reading refer to Trager (1988) and Snelling (1995).

Dorymyrmex grandulus (Forel, 1922)

Prenolepis parvula var. *grandula* Forel, 1922

Conomyrma grandula Trager, 1988

Diagnosis Description from Trager (1988). A small brown-yellow to dark brown species. Head of variable shape. The mesotal profile angular that is the with distinct dorsal and declivous faces. The mesonotal declivity not extremely steep. The propodeal cone with a narrow base, this tubercle is short (Snelling 1995).

Natural History *D. gradulus* is often collected in areas of sandy soils in open areas to more mesic woodland (Trager 1988). Data from this study suggest that *D. gradulus* can be found in the mixed hardwood pine dominated forest.

Range Michigan, New Jersey south to Florida west to Alabama (Snelling 1995).

Distribution in Louisiana Rapides Parish (fig.188).

Label Data RAPIDES PAR., Woodworth, Alex. St. For, 19-Oct-2003, Ant vial, Mixed Hardwood, K. E. Landry (3) LSAM;

Comments: This is a complicated genus, and care should be taken when keying out species refer to Trager (1988) and Snelling (1995).

Forelius Emery, 1888

Generic Diagnosis and Natural History and Natural Hisotry Small monomorphic ants. The integument is thin and flexible. Antenna are 12-segmented, lacking an apical club. Eyes are located toward the midline; ocelli lacking. The petiole is small and inclined. Erect pilosity is sparse. Like the other genera of Dolichoderines, they emit an unpleasant smell (Smith 1949). This genus maybe confused with *Tapinoma* and *Linepithema*. The petiole is more developed than in *Tapinoma*. Erect hairs on the alitrunk and long hairs on the clypeus that reach the apices of the mandibles will separate this genus from *Linepithema* and *Tapinoma*. A number of species were transferred from *Iridomyrmex* Mayr to *Forelius* (Snelling and George 1979).

Generic Distribution 17 total species (Bolton 1995); three nearctic species (Cuezzo 2000)

Key to Species after Cuezzo (2000).

- 1 Posterior border of head with a median concavity..... *Forelius analis* (fig. 181)
- 1' Posterior border of head straight, lacking any concavity..... *Forelius pruinosus*

Species Recorded from Louisiana (one?)

Forelius analis (Andre, 1893)

Tapinoma anale Andre, 1893

Iridomyrmex pruinosus var. *testaceus* Cole, 1936

Diagnosis Very similar to *Forelius pruinosus*. *Forelius analis* is a small ant with variable color from dark brown to a yellow-orange. Body covered with grey appressed hairs that are less dense than in *F. pruinosus* (Creighton 1950). Head in frontal view with a depression on the vertex of the head (Cuezzo 2000).

Natural History Similar to that of *F. pruinosus*.

Range California east to Texas.

Distribution in Louisiana Bienville, East Baton Rouge, Rapides, and Plaquemines Parishes (fig.189).

Label Data BIENVILLE PAR., Lucky, 30-Apr-1963, H W Echols (1) SFRS; E. BATON ROUGE PAR., Baton Rouge, 20-?-1960, (1) SRSS; RAPIDES PAR., Calcasieu, 24-Apr-1961, stomach of flying night hawk *Chordeiles minor* 0600, J.Moser (20+) vial SRSS; Calcasieu, 27-Apr-1961, stomach of bull bat, (1) SFRS, PLAQUEMINES PAR., Happy Jack, 11-Oct-1914, J. R. Horton, (1) SRSS.

Comments: Specimens were previously determined and were in very poor condition and a positive evaluation was improbable. I include this species but suspect that the specimens are *F. pruinosus*.

Forelius pruinosus (Roger, 1863)

Tapinoma pruinosum Roger, 1863

Diagnosis A small ant, whose coloration varies across its range. The specimens viewed by me in Louisiana are a orange-brown, yet it can be found to be yellow to brown as seen in specimens from the 1960s. The body is covered in white or grey appressed hairs. A few erect hairs are present on the pronotum.

Natural History Warren and Rouse (1969) found it in fields, pastures and open woods in Arkansas. Cole (1940) found it in be common in the open grass fields of the Smoky Mountains. Smith (1916b) found it tends many of homopterous insects such as scales and aphids. Commonly collected with use of bait vials, baited with honey or Vienna sausage. It was collected in human modified environments such as urban settings such as Baton Rouge and a cemetery. *Forelius pruninosus* is found in the southeast mixed pine hardwood forest and the west gulf coastal plain longleaf pine forest ecoregions, however, it was not found in the natural habitats in these regions.

Range New York south to Florida west to New Mexico and Wisconsin (Smith 1979).

Distribution in Louisiana Bienville, East Baton Rouge, Rapides Parishes (fig.190).

Label Data BIENVILLE PAR., Lucky Parish Rd, 729x Parish Rd 729-1, 28-Jul-2002, Honey trap, M. A. Seymour, (17) STDC/LSAM E. BATON ROUGE PAR., Baton Rouge, Spanish Town date range (07-Apr-1999—27-Apr-2000), Vienna Sus, honey, and peanut butter Traps, L. M. Hooper (125) STDC/LSAM/FAFC; RAPIDES PAR., Cheneyville, Pratts Cemetry Rd, Clearweater Cemetry, 27-Jul-2002, Honey trap, M. A. Seymour STDC/LSAM (16) STDC/LSAM.

Linepithema Mayr, 1862

Generic Diagnosis and Natural History and Natural Hisotry Description based on Smith (1947) Small monomorphic ants. Similar to other Dolichoderines. Antenna are 12-segmented lacking an apical club. Eyes are located toward the midline; ocelli lacking. The

integument is thin and flexible. The mandibles have numerous teeth. The mesosoma lacks erect pilosity. Petiole developed and is not vestigial as it is in the genus *Tapinoma*. The hairs on the clypeus fall short of the distal portion of the mandibles (MacKay and MacKay 2002). This genus may be confused with *Tapinoma* and *Forelius* see those genera for diagnostic characters.

Generic Distribution 16 total species; two nearctic species

Species Recorded from Louisiana (one):

Linepithema humile (Mayr, 1868)

Hypoclinea (Iridomyrmex) humilis Mayr, 1868

Diagnosis Small ants that are extremely variable in color, can be light brown to nearly black. The mesoepinotal and epinotal sutures are not well developed but visible. Generic characters will separate it from all others in Louisiana.

Natural History An exotic species, it forms large colonies, and some of these colonies are referred to as supercolonies which consist of millions of individuals that extend over thousands of miles (Holway *et al.* 1998a). Colonies are composed of multiple queens in an array of sub-colonies, which spread over the landscape they are often found near water sources (permanent and intermittent) such as lakes, streams, and ponds. They are more common in disturbed habitats, however they can be found in natural areas. Nests may be found beneath boards, mulch, soil, and tree roots, and they will nest in potted plants. They are highly dependent on moisture and liquid food for their survival (Holway 1998b) in arid areas such as California. Data from this study find *L. humile* to inhabit pine-dominated mixed hardwood forest, and urban settings. Smith (1937) noted it was very common in the area of Baton Rouge, nesting at the base of trees. Specimens are often collected with baits but also can be taken with pitfall traps

and shifting. Smith (1924b) noted on this insects' pestiferous nature saying that it will even travel over ice to get to meat in an ice box.

Range An introduced species from South America, found in California, Nevada, Arizona, Louisiana, Florida, Arkansas, South Carolina and few other states and isolated localities (Suarez 2001).

Distribution in Louisiana Caddo, East Baton Rouge, Rapides and Sabine Parishes (fig.191).

Label Data CADDO PAR., Shreveport, Intersection of Bencombe Rd and Pines Rd, 6-Feb-2004, by hand, K. Berry, Vial (58)STDC/LSAM/FAFC; EAST BATON ROUGE PAR., Baton Rouge, nr. LSU Univ. Lakes, 15-Jul-2003, K. O'Brien (8)STDC/FAFC; RAPIDES PAR., In house Pineville, 14-May-1975, house, J Moser, vial (100+) SRSS; In house Pineville, ?-Jan-1975, house, J Moser, vial (234) SRSS; SABINE PAR., Converse, Fisherman's Warf, 17-Jun-2003, off trees by hand, S. T. Dash (7) FAFC; Zwolle, N Toledo Bend St. park off LA 329, 17-Jun-2003, sifting leaf litter, S. T. Dash (25)LSAM/STDC.

Tapinoma Förster, 1850

Generic Diagnosis and Natural History and Natural Hisotry Description based on Smith (1947).Very small to small monomorphic ants. The integument is thin and flexible. Antenna are 12-segmented lacking an apical club. Eyes are located toward the midline; ocelli lacking. Mandible with small teeth. Erect pilosity is sparse, pubescence appressed (Smith 1949, Smith 1965). The petiolar node is vestigial and hidden by the first gastric segment; this character will separate it from other Dolichoderines. Like the other genera of Dolichoderines, *Tapinoma* emit a unique smell liken to “tapinoma” or butyric acid (Creighton 1950, Smith 1979). Some people think it smells like tropical suntan lotion while others attribute the smell to rotting

bananas or coconut. There are three species in North America, one is introduced (*T. melanocephalum*). Nests are found in variety of habitats such as soil, under bark and stones, plant cavities, animal nests and insect galls. Diet consists of honeydew, arthropods, and plant juices from extra-flora nectaries (Smith 1979).

Generic Distribution 62 total species (Bolton 1995); three nearctic species (Smith 1979).

Key to Species

1 Uniformly dark in color..... *Tapinoma sessile* (fig. 184)

1' Head and alitrunk dark brown to black, the gaster is pale grey

..... *Tapinoma melanocephalum* (fig. 183)

Species recorded from Louisiana (two):

Tapinoma melanocephalum (Fabricius, 1793)

Formica melanocephalum Fabricius, 1793

Myrmica pellicida Smith, 1857

Formica familiaris Smith, 1860

Tapinoma (Micromyrma) melanocephalum var. *austrle* Sanschi, 1928

Diagnosis A very small ant. Antennal scapes surpass the occipital border. The gaster is pale light grey; the head and mesosoma is brown to black (Creighton 1950). This color pattern should distinguish it from any other ant in Louisiana.

Natural History An exotic species that is considered a pest. Nests found in soil, logs, and decaying plant material, also found in houses and greenhouses. In Florida, it is found in disturbed areas under bark, rocks, and other ground cover (Deyrup *et al.* 2000). As in *T. sessile* colonies, they are not territorial and hostilities between colonies do not exist. Similarly to *T. sessile*, *T. melanocephalum* has an affinity for honeydew and does appear to feed on other

arthropods (Smith 1965). Workers forage in less a organized manner than *T. sessile* which forms organized trails.

Range Introduced species. Established in Florida as well as isolated localities such as Iowa, and New Mexico, Maryland.

Distribution in Louisiana Terrebonne Parish (fig.192).

Label Data TERREBONNE PAR., 6302 W. Park St. Houma Pet Shop, 19-Dec-1999, J. Paschen, (Vail) (5) LSAM.

Tapinoma sessile (Say, 1836)

Formica sessilis Say, 1836

Tapinoma boreale Roger, 1863

Formica gracilis Buckley, 1866

Formica parva Buckley, 1866

Diagnosis A very small species. Antennal scapes surpassing the occipital border. The body is uniformly dark brown to black, it should be noted, however, that color is very variable (Creighton 1950). The clypeus with a pair of erect hairs on the clypeal edge (Smith 1965) superficially resembling *Brachymyrmex* however, *Brachymyrmex* processes an acidopore and only 9-segmented antennae.

Natural History Nests are found in variety of habitats such as in soil, under bark and stones, plant cavities, animal nests and insect galls (Smith 1949). Colonies are not territorial and hostilities between colonies do not exist. Warren and Rouse (1969) noted it has been collected on willow, locust, oak, and hickory trees as well as agricultural crops such as corn, cotton, and soybeans. Data from this study indicate it can be found in the following macrohabitats in Louisiana: Longleaf Pine Savanna, wet pine flatwood, mixed hardwood and disturbed habitats.

Over most of its range, *T. sessile* is considered a household pest; however this status is not preserved in Louisiana i.e. it is not considered a pest. Where it is a pest, it invades the home in search of sweets and other household foods (Smith 1965).

Range Southern Canada through all 48 states, however absent from arid regions (Smith 1949, Creighton 1950) Van Pelt (1958) suggests that the extensive range is an artifact of human activity.

Distribution in Louisiana Bienville, East Baton Rouge, Rapides and Tangipahoa, Washington Parishes (fig. 193).

Label Data BIENVILLE PAR., Lucky Rt 9 , sweeping composite and yucca, S. T. Dash (1) STDC; EAST BATON ROUGE PAR. Baton Rouge, Spanish Town, Presbyterian Apts, 18-Feb-2000, Honey trap, L. M. Hooper (2)FAFC; RAPIDES PAR., Woodworth, Alex. St. For, {19-May-2002-11-Jun-2003}, Ant vials, Mixed Hardwood, K. E. Landry (32)STDC/LSAM/FAFC; ST. TAMMAMY PAR., Abita Creek Preserve, 30° 31' 25" N 89° 58' 07" W, FIT/MT, Woods, Longleaf Savanna, wet pine flatwoods, D. Prowell (10) PCOL; Abita Creek Preserve, 30° 31' 25" N 89° 58' 07" W, bait, Woods, Longleaf Savanna, wet pine flatwoods (22) PCOL; TANGIPAHOA PAR., Arcola Sandy Hollow WMA, 09-Sep-2002, Pitfall trap, Longleaf Pine Savanna, K. E. Landry Plot (2); WASHINGTON PAR., Bogalusa, Bens Creek WMA, 10-Nov-2002, Ant vials, Mixed Hardwood, K. E. Landry, Plot # 5 Trap # 1 (1) LSAM.



Fig 177 *Dolichodercus mariae*



Fig. 178 *Dolichodercus taxhenbergi*



Fig. 179 *Dorymyrmex bureni*



Fig. 180 *Dorymyrmex grandulus*



Fig. 181 *Forelius prunoious*



Fig. 182 *Linepithema humile*



Fig 183 *Tapinomia melanocephalum*



Fig. 184 *T. sessile*



Fig. 185 Collection localities for *Dolichoderus mariae*



Fig. 186 Collection localities for *Dolichoderus taschenbergi*



Fig. 187 Collection localities for *Dorymyrmex bureni*



Fig. 188 Collection localities for *Dorymyrmex grandulus*



Fig. 189 Collection localities for *Forelius analis*



Fig. 190 Collection localities for *F. prunoious*



Fig. 191 Collection localities for
Linepithema humile



Fig. 192 Collection localities for
Tapinomia melanocephalum



Fig. 193 Collection localities for
T. sessile

Formiciane

Key to the Genera of Formicinae in Louisiana: Creighton (1950) and Hölldobler and Wilson (1990).

- 1 Antenna with 9 segments.....*Brachymyrmex*
- 1' Antenna with 12 segments.....2
- 2 Mesosoma evenly convex , that is the propodeum not depressed below the level of promesonotum, the antennal insertions are well behind posterior margin of clypeus...*Camponotus*
- 2' Mesosoma with a distinct depressed between the propodeum and the promesonotum, the antennal insertions touch or close to posterior margin of clypeus.....3
3. Mandibles sickle-shaped lacking well defined teeth, rather minute serrate
..... *Polyergus lucidus* (fig. 206)
- 3' Mandibles triangular with well defined teeth.....4
- 4 Frontal carinae well define and distinct, the frontal lobes raised slightly upward.....*Formica*
- 4' Frontal carinae not well define the frontal lobes flat.....5
- 5 The antennal scape not surpassing the occipital margin by more then one-third its length..... *Lasius alienus* (fig.207)
- 5' The antennal scape surpassing the occipital margin by at least one thirds its length, normally very long scapes.....6
- 6 The mesosoma when viewed dorsally with a strong constriction behind pronotum giving the appearance of an hour glass..... *Prenolepis imparis* (fig.215)
- 6' The mesosoma in dorsal view weakly constricted behind pronotum.....*Paratrechina*

Camponotini

***Camponotus* Mayr, 1861**

Generic Diagnosis and Natural History and Natural Hisotry A very large global genus with seven subgenera in nearctic. Small to very large species, many of which are polymorphic. Twelve-segmented antenna lacking an apical club. The antennal fossa are not in contact with the posterior border of the clypeus. The mesosoma is continuous and evenly rounded, that is there are no depressions (Smith 1949). Species may be confused with *Formica*, *Dolichoderus*, and *Lasius*. *Formica* and *Lasius* both have the antennal fossae that are in contact with the posterior border of the clypeus. The mesosoma of *Lasius* and *Formica* are not continuous and have a depression on the mesosoma. *Dolichoderus* may be confused with the major of the subgenus *Colobopsis*. *Colobopsis* can be separated based on the presence of an acidopore which is lacking in all of genera of Dolichoderines. The natural histories of the species are diverse.

Generic Distribution >1500 Global species; > 46 nearctic species.

Key to the subgenera of *Camponotus* in Louisiana (based on Creighton 1950 and MacKay 2003).

- 1 Anterior portion of the head truncate; circular with marginate border in majors
.....*C. (Colobopsis)*
- 1' Anterior portion of the head lacking these characteristics.....2
- 2 The anterior border of the clypeus projecting a depression at the midline with a distinct notch*C. (Myrmentoma)*
- 2' Anterior border clypeus not same as above.....3
- 3 Clypeus with carina; the antennal scape flatted at base the antennal fossae shallow.....*C. (Tanaemyrmex)*
- 3' Clypeus without carnia antennal scape not flatted basally and the antennal fossae are deep..... *C. (Camponotus)*

Camponotus (Camponotus)

One of the largest subgenera of *Camponotus* in North America. Description based on Smith (1949) Creighton (1950), and MacKay and MacKay (2002). Species are large to very large-sized ants whose majors have robust heads. The clypeus normally without carinae, but if present they are poorly developed. The clypeus are carinate. The antennal scapes never flatten basally and the clypeal fossae obvious. The meso and metathoracic legs with several stiff hairs (bristles) on the flexor edge. A number of species nest in wood. Colonies are large > 1000 workers. The diet of the species is omnivorous. Some species are considered pests.

Key to Species Based on Creighton (1950) and MacKay (2003).

- 1 The mesosoma and first gastric tergite black..... *Camponotus pennsylvanicus* (fig.195)
- 1' The mesosoma and first gastric tergite red to red brown... *Camponotus chromaiodes* (fig. 194)

Species recorded from Louisiana (two):

***Camponotus (Camponotus) chromaiodes* Bolton, 1995**

Diagnosis Description from MacKay (2003). Dark colored ants head and gaster black, mesosoma and legs deep red. Gaster covered appressed with golden hairs. Mesosoma with a covered with scattered appressed golden pubescence.

Natural History Dennis (1938) located it in logs, stumps and in snags in Tennessee. It nests in rotten wood (MacKay). In Louisiana it has been collected in mixed hardwood forest, upland mixed hardwood forest and in longleaf pine-savannas. It can be found in the Tunica loess hills, west gulf coastal plain longleaf pine-forest and the east gulf coastal plain longleaf pine forest ecoregions.

Range New Hampshire south to North Carolina, west to Alabama north to Iowa (MacKay 2003).

Distribution in Louisiana Natchitoches, St. Tammany, and W. Feliciana Parishes (fig. 216).

Label Data NATCHITOCHE PAR., Kistachie Nat Forest, Kistachie Bayou, 19-Jul-2003, Hg Vapor, Bottomland hardwood, S. T. Dash & C. R. Bartlett (1) STDC; ST. TAMMANY PAR., Abita Creek Flatwoods Pres., 8-Sep-2000, pitfall trap, A.M. Pranschke (5) FAFC/LSAM; W. FELICIANA PAR., Feliciana Preserve 6 mi ESE St. Francisville, 16-Apr-1999, 16-Apr-1999 J. L. Johnson (1) LSAM; Feliciana Preserve 7km SE St. Francisville, 24-Mar-2001, J. D. Siebert (1) LSAM..

Camponotus (Camponotus) pennsylvanicus (DeGeer, 1773)

Formica pensylvanica DeGeer 1773

Camponotus herculeanus herculeanus herculeano-pennsylvanicus Forel, 1879

Camponotus herculeanus pennsylvanica var. *machican* Wheeler, 1910

Species Diagnosis Description based on Wheeler (1910b) and MacKay (2003). Very large, black colored ants. The black coloration however in some specimens exhibits a reddish component on the mesosoma, legs, and petiole. Gaster with long, dense appressed golden-yellow to pale-yellow pubescences. Body hairs are erect but not dense (Smith 1965). It should be noted that sculpturing and coloration is highly variable.

Natural History Colonies located in living or dead trees, as well as numerous types of wood such as logs, stumps, and telephone poles (Dennis 1938, Smith 1965, 1967). Dennis (1938) noted colonies were collected in shady areas with numerous standing trees. This ant is often a pest species because of its habit of nesting in wood. In Arkansas it has been collected in agricultural fields and off poplar and locust trees (Warren and Rouse 1969). *Camponotus pennsylvanica* feeds on honey dew from homopterous insects as well of fruits and some insects

(Smith 1924). Data from this study suggest it can be found in the following macrohabitats: beech mixed-hardwood, loblolly pine, oak-dominated forest with palmetto understory, longleaf-pine savanna wet pine flatwoods, mix hardwood forest, longleaf- pine savanna, urban habitats, and zoological parks. *Camponotus pennsylvanicus* can be found in all of the ecoregions in the state. It has been collected using flight intercept traps, by hand collecting, sifting, sweeping, pitfall, Hg vapor light, and baits (honey and Vienna sausage). One interesting note is it was the first native ant to be described (Smith 1979).

Range New Brunswick south to Florida west to North Dakota and Texas (Smith 1979).

Distribution in Louisiana Allen, East Baton Rouge, Calcasieu, Orleans, Rapides, St. Landry, St. Tammany, Tangipahoa, and West Feliciana Parishes (fig. 217).

Label Data ALLEN PAR., Elizabeth, 16-Apr-1967, on bark dead holly, L. S. Pickard (6) SRSS; CALCASIEU PAR., Nr. Moss Bluff, Sam Houston Jones St. Park, 09-Mar—16-May-2003, 09-Mar—16-May-2003, A. R. Cline (1) STDC; E. BATON ROUGE PAR., Baton Rouge, Research Station, 18-Apr-2004, Sweeping mixed veg in fields, S. T. Dash (2) STDC; Blue Bonnet Apartments, 23-Jun-2000, at large, A. Weber (1) LSAM; Hundred Oak Sub., 12-vii-1994, under log, L. M. Rodriguez (1) LSAM; Baker, Greenwell Springs & Port Hudson Hubbs, site # 22, 1100, J. Rosson Study site22, 13-Mar-2003, Ant vial V. Sausage, J. Rosson (3) LSAM; Baker, Palomine Park @ Bridlewood, Site # 28 1500, J. Rosson Study, 2-Sep-2002, Ant vial Honey, J L Rosson (1) FAFC; Baker, Palomine Park @ Bridlewood, Site # 28 1500, 2-Sep-2002, Ant vial Honey2-Sep-2002, J. Rosson (1) LSAM; Baton Rouge Union Courtyard at LSU, 09-viii-2002, by hand, Wesley Burnside (1) FAFC; Baton Rouge, Bluebonnet Swamp, 18-Sep-2002 by hand, Justin Fuselier (1) FAFC; Baton Rouge, Bluebonnet Swamp 30-Oct-2002, by hand, R. C. Maturin (4) FAFC; Baton Rouge, Bluebonnet Swamp, 4-Apr-2003, Hg vapor Lam, S. T. Dash (1)

STDC; Baton Rouge, Highland Rd. Observatory Park, ?-Sep-2002, Pitfall trap, M. G. Radtke(1)

STDC; Baton Rouge, Hooper Rd, BREC Hooper Park, 3-Apr-2003, Sweeping understory, S. T. Dash (1) LSAM; Baton Rouge, River Rd, 05-ix-2002, by hand, L. A. Womack (1) STDC; Baton Rouge, River Rd,20-x-2004, by hand, L. A. Womack, (1) FAFC; Baton Rouge, Shady Park BREC Park, 3-Apr-2003, sweeping mixed field, S. T. Dash (1) STDC; LSU Campus, 1-May-2003, by hand, L. Eisenberg (1) LSAM; NATCHITOCHEES PAR., Kisatchie Nat For, Kisatchie Bayou Campground, 19-Jul-2003, Hg light, Beech mix hardwood (1) LSAM; Kistachie, 20-Jul-2003, sifting, A. R. Cline (1) LSAM; RAPIDES PAR., Pineville, 6-Apr-1965, J Moser, (1) SRSS; Pineville, 17-Apr-1965w/ D terbrans loblolly pine on bark 8' w B. terebrans, L. S. Pickard (1) SRSS; Woodworth, 10-Feb-1999, at large, L Gautreaux (1) LSAM; ORLEANS PAR., New Orleans, Audubon Zoo, 19-viii-1999, Pitfall trap PF5, behind gorillas, L. M. Hooper Bui & A. M. Pranschke (1) FAFC; ST. LANDRY PAR., Washington, Thistlewaite WMA off Rice Rd, 11-Jun-2003, sifting leaf litter oak dom forest with palmetto under story, S. T. Dash & K. S. O'Brien (2) FAFC; ST. TAMMANY PAR., Abita Creek Preserve, 30° 31' 25" N 89° 58' 07" W, FIT/MT, Woods, Longleaf Savanna, wet pine flatwoods, D. Prowell(2) PCOL; Mandeville, Foutianbleau St. Park, 20-Mar-2003, Sweeping tree edge mostly Chinese tallow, S. T. Dash (4) STDC; TANGIPAHOA PAR., Arcola, Sandy Hollow WMA, 6-Aug-2003, Ant vials, lot # 6 Trap # 3 Longleaf Pine Savanna, K. E. Landry (3) LSAM; Arcola, Sandy Hollow WMA, 9-Sep-2002, pitfall, Plot 6 Trap 1, Longleaf Pine Savanna. K. E. Landry (1) FAFC; Arcola, Sandy Hollow WMA, 4-Sep-2002, Pitfall, Plot 6 Trap 3 Longleaf Pine Savanna, K. E. Landry (1) STDC; Arcola, Sandy Hollow WMA, 8-Jan-2003, Pitfall, Longleaf Pine Savanna Plot 6 Trap 3, K. E. Landry (3) FAFC, Loranger, 2 mile S., 01-ix-2002, by hand, P. Mumma, (1) STDC; W. FELICIANA PAR., Feliciana Preserve, 30°47' N 91° 15' W, 15-Mar—14-Apr-2003, Flight Intercept

Trap, A. Tishechkin(1) LSAM; West. Feliciana, Feliciana Preserve, 30°47' N 91° 15' W, 18-Sep-2002, Sifting litter, A. R. Cline & A. Tishechkin(2) STDC.

Camponotus (Colobopsis)

Description from Creighton (1950) and MacKay and MacKay (2002). Workers are small to medium sized ants. The anterior surface of the majors and females are truncate and circular in shape with a marginate border. Head is sub cylindrical. The clypeus, cheeks and mandibles comprise the anterior surfaces of the head. The species are arboreal in nature and nest in twigs, insect galls or nuts. Their diet consists mostly of honey dew (Smith 1949). The frontal portion of the head on the majors functions in a phragmatic role, that is as a door (Creighton 1967). Minors often with the declivitous face of the propodeum being concave as in *Dolichoderus*.

Key to Species Based on Creighton (1950) and MacKay (2003) majors or females are needed to make proper identifications.

- 1 The metanotal suture of major and minor deeply impressed, rounded between faces..... *Camponotus impressus* (fig. 197)
- 1' The metanotal suture of major and minor shallowly impressed, angulated between faces.....2
- 2 Sculpturing of the truncate part of the head, fine..... *Camponotus mississippiensis*
- 2' Sculpturing of the truncate part of the head, coarse with foveolate punctures.....
..... *Camponotus obliquus* (fig. 198)

Species recorded from Louisiana (three):

Camponotus (Colobopsis) impressus (Roger, 1863)

Colobopsis impressa Roger, 1863

Species Diagnosis Description based on Wheeler (1910b) and MacKay (2003). The head, thorax, and gaster is brown. Promesonotum of the major moderately to strongly convex and

always higher than the dorsum of the epinotal, which is rounded as well. Minor with mesoepinotal suture the head and mesosoma brown-red, the gaster is black. Smith (1924a) notes that the truncate portion of the head is more parallel than the other species.

Natural History It is noted to nest in culms of sedges (MacKay 2003). Nevertheless, it is not limited to this nesting location. Cokendolpher and Francke (1990) found nest in oak galls in western Texas and Smith (1924) found a colony in the twig of a pecan tree in Mississippi. I found a colony nesting in Chinese tallow (*S. sebiferna*). Data from this study suggest it can be found in such macrohabitats as mixed hardwood-woodlands, secondary growth woodlands, and in semi urban settings. *Camponotus impressus* can be collected by sweeping trees and shrubs.

Range Maryland south to Florida, west to central Texas (Smith 1979).

Distribution in Louisiana Cameron, East Baton Rouge, Plaquemines, and St. Tammany Parishes (fig. 218).

Label Data CAMERON PAR., 24-Aug-1993, Blacklight # 5-5, S Johnson, LSAM (1) E.
BATON ROUGE PAR., Baker, County Lane, 4-Jun-2003, Sweeping trees shrubs, Seymour 726, S T Dash (2) STDC; Baton Rouge, Baton Rouge, Nr. LSU Campus, off River Rd, Mississippi River Levee, 12-Apr-2003, sweeping, S. T. Dash (2) LSAM/FAFC; Baton Rouge, off River Rd. LSU, Mississippi Levee, 14-Jul-2003, Hg vapor Lamp, S. T. Dash (1) STDC; PLAQUEMINES PAR., Boothvile, 10-Jul-1992, Black light trap, D. Genaway, (2) LSAM; ST. TAMMANY PAR., Mandeville, Fontainebleau St. Park, 20-Mar-2003, Sweeping S. sebiferna +shrubs, S. T. Dash (4) STDC.

Camponotus (Colobopsis) mississippiensis Smith, 1923

Species Diagnosis Description based on MacKay (2003) The mesosoma weakly impressed at metanotal suture in the major. Anterior portion of the head in the major with fine reticulation and small punctures.

Natural History Smith (1924) found colonies in the twigs of white ash and oak galls in Mississippi, during this same study he observed it feeding on honey dew.

Range Maryland south to Florida west to Oklahoma and Louisiana (Smith 1979).

Distribution in Louisiana Rapides Parish (fig. 219).

Label Data RAPIDES PAR., Pineville, 15-May-1963, light trap, J Moser, (2) SRSS

Comments: *Camponotus mississippiensis* was not encountered during the current study.

***Camponotus (Colobopsis) obliquus* Smith, 1931**

Diagnosis Description based on MacKay (2003) Small ants, major with the mesosoma weakly impressed at the metanotal suture. The anterior portion of the head is punctate. The minor with a large impression on the mesosoma at the anterior face of the propodeum. The head and mesosoma brown, the gaster is dark brown to black for the specimens I have collected. Similar to *C. impressus* however it is smaller in size and the head with coarser sculpturing (Smith 1931).

Natural History Similar to that of the other species of *Camponotus (Colobopsis)*. In Mississippi Smith (1931) found it to nest in a hickory nut husk. *Camponotus obliquus* is in the vicinity of the city of Baton Rouge, specimens were taken using a honey-bait trap and sweeping vegetation along the Mississippi River levee.

Range Alabama and Mississippi (Smith 1979).

Distribution in Louisiana East Baton Rouge Parish (fig. 220).

Label Data E. BATON ROUGE PAR., Baton Rouge, Nr. LSU Campus, off River Rd, Mississippi River levee, 12-Apr-2003, Sweeping, S. T. Dash (1) STDC; Baton Rouge, Spanish Town, ST-4, 23-Sep-1999, bait trap: honey, L. M. Hooper (1) LSAM.

Camponotus (Myrmentoma)

Description from Creighton (1950) and MacKay and MacKay (2002). The anterior border of the clypeus projecting with a median notch; posterior to this notch is a triangular impression. Small to very large-sized ants. The meso and metatibiae lack bristles on the flexor surface. The body is usually shiny. Colonies are small and can be found in insect galls, wood, hollow cavities of plants, and may nest in wooded structures (Smith 1949).

Key to Species Based on Creighton (1950) and MacKay (2003).

1 Cheeks with small foveolae and hairless..... *Camponotus nearcticus* (fig. 200)

1' Cheeks with numerous hairs arising from oval foveolae..... *Camponotus caryae* (fig. 199)

Species recorded from Louisiana (two):

Camponotus (Myrmentoma) caryae (Fitch, 1855)

Formica caryae Fitch, 1855

Camponotus marginatus discolor var. *enemidatus* Emery, 1893

Diagnosis Description based on MacKay (2003). A medium-size ant. The head and mesosoma a brown-red color the gaster is darker, being dark brown to black. The anterior clypeal edge with a distinct medial indentation. Clypeus and checks with numerous erect hairs ant are equal in length. In *C. nearcticus* these hairs are absent. (Creighton 1950).

Natural History Smith (1931) found it nesting in a “cavity in a pecan husk” Smith (1924a) also found this species nesting in the soil, and under bark. *Camponotus caryae* has been collected from trees such as oaks and in Tennessee was found to inhabit Oak-Chestnut woodland

(Dennis 1938). Cole (1940) found it to nest under bark, in snags and once in an abandoned hornet nest. *Camponotus caryae* like other species of *Camponotus* have a “sweet-tooth” and are often found tending homopterous insects for honey dew (Smith 1924a).

Range New York South to Florida west into Texas (Smith 1979).

Distribution in Louisiana St. Bernard Parish (fig. 221).

Label Data Chalmette, 6-Oct-2002, Fence post, N. H. Nguyen (2) STDC.

***Camponotus (Myrmentoma) nearcticus* Emery, 1893**

Camponotus marginatus var. *nearcticus* Emery, 1893

Camponotus marginatus var. *minutus* Emery, 1893

Camponotus marginatus var. *decipiens* Emery, 1893

Camponotus fallax fallax var. *pardus* Wheeler, 1910

Camponotus fallax fallax var. *tanquargyi* Wheeler, 1910

Camponotus fallax fallax var. *pavidus* Wheeler, 1910

Diagnosis Description based on Wheeler (1910b) and MacKay (2003). Large ants. Color black, however variable over range and may be more reddish to brownish (Smith 1965). Large foveolae on clypeus, the clypeus is emarginated. Clypeus and with erect hairs; hairs are absent from rest of head. Gena with foveolae. Legs and body having sparse pubescence. The body is shiny. Petiole is narrow in profile.

Natural History Small colonies are found under bark, in twigs, other plant cavities, as well as in galls and pine cones. May nest in the wood of homes and is considered a minor pest (Smith 1965). In Louisiana, it has been also collected under the bark of loblolly pines. It inhabits longleaf-pine savannas, upland mixed hardwood forest, and mixed-pine dominated hardwood forest. It has been collected by hand while foraging on oak species and sweet gum.

Range Found over most North America; Ontario south to Florida west to British Columbia south to California (Smith 1979).

Distribution in Louisiana Allen, Assumption Calcasieu, St. Tammany, and West Feliciana Parishes (fig. 222).

Label Data ALLEN PAR., Elizabeth, 6-Sep-1965, Under bark Loblolly late brood, D. F. tree in Fr I all height 2' to 40', J Moser (1) SRSS; ASSUMPTION PAR., Pierre Part Lake Verret, 28-Jun-1992, collected in woods, D. Genaway, (1) LSAM; CALCASIEU PAR., Nr. Moss Bluff, Sam Houston Jones St. Park, 09-Mar-16-May-2003, Flight Intercept Trap, A.R. Cline (2) LSAM; CALCASIEU PAR., Nr. Moss Bluff, Sam Houston Jones St. Park, 10-May-2003, ex hand on forest floor, S.T. Dash (1)STDC; E. BATON ROUGE PAR., Baton Rouge, Kennyworth & Perkins Rd BREC Perkins park, 3-Apr-2003, ex Quercus sp. S. T. Dash (5) LSAM/FAFC; Baton Rouge, Kennyworth & Perkins Rd BREC Perkins park, 3-Apr-2003, Liquidambar styraciflua, S. T. Dash (1) STDC; ST. TAMMANY PAR., Lake Ramsay Preserve WMA, 30° 31' N 90° 10' W, FIT, Longleaf Pine Savannah, D. Colby(2) PCOL; W. FELICIANA PAR., Feliciana Preserve, 30°47' N 91°15' W, 15-Mar—14-Apr-2003, FIT, A. Tishechkin (1) STDC; Feliciana Preserve, 30°47' N 91°15' W, 14-Apr-2003, A. Tishechkin (1) LSAM.

Camponotus (Tanaemyrmex)

Description from Creighton (1950) and MacKay and MacKay (2002). Large to very large-sized ants. The clypeus with carinae and with a lobe in addition to lacking a median notch. The antennal scape flatten basally and the fossae are shallow. Species in this subgenus rarely nest in wood and prefer to nest under rocks, logs, and soil.

Key to Species Based on Creighton (1950) and MacKay (200).

- 1 Cheeks without erect hairs (however, a few hairs may be) present
 *Camponotus castaneus* (fig. 203)
- 1' Cheeks with erect hairs.....2
- 2 Head black, mesosoma and gaster the same color; yellow-brown, gaster may be dark, but only slightly, never black..... *Camponotus americanus* (fig.201)
- 2' Head and mesosoma rust red to red-brown the gaster black.....*Camponotus atriceps* (fig. 202)

Species recorded from Louisiana (three):

Camponotus (Tanaemyrmex) americanus Mayr, 1862

Camponotus (Camponotus) castaneus strips Santschi, 1936

Species Diagnosis MacKay (2003) Very large ants. The head dark brown to black mesosoma a yellow brown, shiny, color is extremely variable even within the some colony (Wheeler 1910b). Deep elongate foveola on gena of worker,with many erect hairs. Scapes long surpassing the occipital margins. The gaster with limited scatter hairs (Smith 1965). Overall very similar in appearance to *C. castaneus* (Latreille) and was considered to be a subspecies of that species (Wheeler 1910).

Natural History *Camponotus americanus* was found to nest in soil, under stones, rotten logs (Dennis 1938, Cole 1940, Cokendolpher and Francke 1990). In Arkansas, the species has been found in agricultural fields and in oak-hickory forest (Warren and Rouse 1969). Smith (1924) notes that it exhibits similar habitats as *C. castaneus*. In Louisiana, I have found it in upland-pine savannahs, flatwood longleaf-pine savannas, mixed upland-hardwood and beech mixed-hardwood forest (Wheeler 1910b). It can be found in the following ecoregions: Northwest mixed-pine hardwood forest, west gulf-coastal plain longleaf-pine forest, east gulf-coastal-plain

longleaf-pine forest and Tunica loess hills. It has been collected using Berlese funnel, flight intercept traps, pitfall traps, by hand, and occasionally at mercury vapor lights.

Range Ontario south to Florida west to Michigan and Texas (Smith 1979).

Distribution in Louisiana Bossier, Natchitoches, Rapides, Tangipahoa, and West Feliciana Parishes (fig. 223).

Label Data BOSSIER PAR., Barksdale AFB, 32 29' 29" N 93 35' 07" W, 22-Apr-1996, on Marshalla tenuifolia in calcareous prairie, D M Pollock (1) MEM; Barksdale AFB, 32 29' 29" N 93 35' 07" W, 8-Apr-1996, blacklight, D M Pollock (1) MEM; E.BATON ROUGE PAR., Bluebonnet Swamp, 18-iiiv-2002, Sweeping, J. Lockhart (6) FAFC; NATCHITOCHE PAR., Kisatchie National Forest, 1 mile NNE of Lotus, 31° 30' N 93° 7.5' W, 15 Aug — 20-Sep 2003, FIT, A. R. Cline (6) LSAM; Kistachie Nat For, 92° 36' long 31° 14' lat, 20-Feb-1963, on nest *Atta texana*, occupying town ant nest, 200' Alt, J. Moser (3) SRSS; Kistachie Nat. For. Kistachie Rang. Dist., Red Dirt Area 1 mi NNE Lotus, 12-Apr-02—Jul-2003, Flight Intercept Trap, A R Cline, (3) LSAM; Kistachie NF, Kistachie Bayou Campground, 31 26.17 N 093.05.728W, 19-Jul-2003, Hg light, Beech mix hardwood (1) LSAM; Kistachie, Kistachie Nat. Forest, ?-Sep-2002, Aerial net, R. M. Krause (1) STDC; RAPIDES PAR., Johnson tr, 25-02-1959, J Moser (1) SRSS; Melder, 1-Mar-1959, nest in soil, T. Russell (6) SRSS; SABINE PAR., Toledo Bend, 16-Jul-2003, trees by hand, S. T. Dash (1) FAFC; TANGIPAHOA PAR., Arcola, Sandy Hollow WMA, 9-Sep-2002, pitfall, plot # 5 trap # 3, K. E. Landry (1)FAFC; W. FELICIANA PAR., Feliciana Preserve, 30°47' N 91° 15' W, 15-Mar—14-Apr-2003, FIT #2, A Tishechkin (3) LSAM; Feliciana Preserve, 30°47' N 91° 15' W, 09-15-May-2003, Flight Intercept Trap, A. Tishechkin (4) LSAM; Feliciana Preserve, 30°47' N 91° 15' W, 15-Mar—14-Apr-2003, Flight Intercept Trap, A. Tishechkin (2) STDC; Feliciana Preserve, 30°47' N 91° 15' W, 01-Feb-09-Mar-2003,

Flight Intercept Trap, Mix upland Hardwood, A. Tishechkin (1) FAFC; Feliciana Preserve, 30°47' N 91° 15' W, (9-15)-May-2003, Flight Intercept Trap, A. Tishechkin (2) STDC; Feliciana Preserve, 11-May —4-Jul-2003, FIT, (40) LSAM; Feliciana Preserve, 30° 47'N 93° 15'W, 14-24-Apr-2003, FIT, Mix Hardwood Forest, A. Tishechkin (15) STDC; Feliciana Preserve, 30° 47'N 93° 15'W, 2-Aug —18-Sep-2003, FIT, Mix Hardwood Forest, A. Tishechkin (26) STDC; Feliciana Preserve, 30° 47'N 93° 15'W, 2-Aug —18-Sep-2003, FIT, Mix Hardwood Forest, A. Tishechkin (38) LSAM; Feliciana Preserve, 30° 47'N 93° 15'W, 24-Apr —21-May-2003, FIT, Mix hardwood, A. Tishechkin (4)STDC.

Camponotus (Tanaemyrmex) atriceps (Smith, 1858)

Diagnosis Description from MacKay (2003). Large to very large-sized ants. A polymorphic species. The head is a brick or rusty red the mesosoma and legs are a lighter red and the gaster is black. Antennal scapes short, flattened at base. Anterior border of clypeus with a lobe. The mesosoma robust. The head of the major in frontal view not obliquely truncate. The clypeus convex, that is distinctly higher than adjacent portions of the cheeks. The scapes and legs with a number of coarse long hairs on all surfaces.

Natural History Nest are found in rotten logs, stumps under rocks, and sometimes in household objects. They are omnivorous and feed on dead arthropods and tend homopterous insects for honey-dew. It is nocturnal (Deyrup and Trager 1986).

Range Georgia south to Florida west Texas Mexico south to Argentina (MacKay 200).

Distribution in Louisiana Ascension and Catahoula Parishes (fig. 224).

Label Data ASCENSION PAR., Prairieville, Haydel residence, 18-Oct-2002, by jar while landscaping, K. C. Haydel (1) STDC; CATAHOULA PAR., Sicily Island, Sicily Island Hill WMA, 1-May-2003, hand coll, M. A. Seymour & S. T. Dash (8) LSAM; Sicily Island, Sicily Island Hill

WMA, 1-May-2003, Berlese funnel, Upland forest litter, S. T. Dash (9) STDC; Sicily Island, Sicily Island Hill WMA, Nr Creek Station, 1-May-2003, Berlese funnel, upland forest litter, S.T. Dash (1) FAFC.

Camponotus (Tanaemyrmex) castaneus (Latreille, 1802)

Formica castanea Latreille, 1802

Formica mellea Say, 1831

Camponotus clarus Wheeler, 1862

Species Diagnosis Description based on Wheeler (1910b) and MacKay (2003). Large to very large ants. A shiny yellow to yellow-red ant whose head and gaster is darker than the mesosoma. Wheeler (1910) noted it is constant in coloration. Head as long as wide. Hairs absent from the gena. Antennal scapes surpasses the occipital border by at least a length greater than the first five funicular segments. Clypeus carinate, the anterior border of the clypeus projecting forward and forming a lobe, which is scalloped. Pubescence lacking over most the body. When hair is present it is depressed.

Natural History Relatively large colonies that nest in soil, logs, and stumps in the final stages of decay (Cole 1940, Van Pelt 1958) under stones, and in the ground (Smith 1924b, Dennis 1938). *Camponotus castaneus* is a nocturnal species, Van Pelt (1958) found *C. castaneus* preferred mesic hydric hammocks. Occasionally found in flatwoods, xeric hammocks, and in river swampland in Weleka Reserve in Florida. In Arkansas it has been found in cotton fields (Warren and Rouse 1969). In Mississippi, it is found in open woodlands (Smith 1924b). It has been collected in Louisiana with pitfall traps, baited (with chicken and dung) pitfall traps, sweep net, by hand, flight intercept traps, and at mercury vapor lights. This species of *Camponotus* is considered to be nocturnal in habits.

Range New York south to Florida west to Iowa and Texas.

Distribution in Louisiana Allen, Bossier, Calcasieu, East Baton Rouge, Orleans, St. Tammany, Tangipahoa, Webster, and West Feliciana Parishes (fig. 225).

Label Data ALLEN PAR., Elizabeth, 21-Nov-1966, on Loblolly pine bark w/ O. tereblans larval, L. S. Pickard (1) SRSS; BIENVILLE PAR., Lucky Rt 9, 28-May-2004, sweeping composit and yucca, S. T. Dash (11) STDC; BOSSIER PAR., Barksdale AFB, 25-Sep-1994, pitfall w/rotten chicken, D. R. Ganaway & V. L. Moseley (1) LSAM; Barksdale AFB, 32 29' 05"N 93 32" W, 2-Nov-1994, pitfall w/rotten chicken, D. R. Ganaway & V. L. Moseley (2) LSAM; CALCASIEU PAR., Moss Bluff, Sam Huston Jones St. Park, 09-Mar-10-Apr-2003, Flight Intercept Trap, A. R. Cline & A. Tishechkin (3) STDC; Nr. Moss Bluff, Sam Houston Jones St. Park, 09-Mar-16-May-2003, Flight Intercept Trap, A. R. Cline (1) STDC; Sam Houston Jones State Park, 9-Mar -16-May-2003, FIT, Mixed Pine Hardwood Forest, A.R.Cline (6) FAFC; Sam Houston Jones State Park, 30° 19' N 93° 16' W, ?-Jul-2003, S. T. Dash (2) FAFC; Sam Houston Jones State Park, 9-Mar—16-May-2003, FIT, A.R.Cline (15) LSAM; E. BATON ROUGE PAR., 3 mi south of LSU, 12-Oct-1996, on porch, C. Hebert (1) LSAM; Baton Rouge, Bluebonnet Swamp., 18-Aug-2002 J. Lockhart (6) FAFC; Baton Rouge, Bluebonnet Swamp, 5-Nov-2002, M. A. Seymour (1) LSAM; Baton Rouge, 9150 Ventura Drive, 17-Arp-2003, blacklight, M. A. Seymour (1) FAFC; Baton Rouge, Beech Habor Ave., 3-Mar-2003, on porch at home, L. Allen (1) FAFC; Baton Rouge, Bluebonnet Swamp, 17-Sep-2002, By Hand, D. Fontenot (1) LSAM; Baton Rouge, Bluebonnet Swamp, 24-Apr-2003, Hg vapor lamp, S. T. Dash (1) STDC; Baton Rouge, Highland Park Observatory, 14-Nov-2003, dung baited, pitfall, M. Radtke (3) STDC; Baton Rouge, Highland Rd. Observatory Park, 9-Oct-2002, pitfall, M. G. Radtke (1) STDC; GRANT PAR., 5 km south Camp Grant Walker, 1-Jun-2004, sweeping road, side composites, S. T. Dash

(1) STDC; ORLEANS PAR., New Orleans, Audubon Zoo, ?-Sep-1999, back road of zoo, L. M. Hooper (1) STDC; New Orleans, Audubon Zoo, 19-Aug-1999, pitfall pf3, Primate Staging Area, L.M. Hooper-Bui & A. M. Pranschke (1) LSAM; RAPIDES PAR., Woodworth Alex St. For WMA LADFW educ center, 2-Jun-2004, open field, pine dom forest, S. T. Dash (2) STDC; Woodworth Alex St. For WMA LADFW educ center, 3-Jun-2004, open field, pine dom forest, S. T. Dash (18) STDC/LSAM SABINE PAR., Toledo Bend, 16-Jul-2003, trees by hand, S. T. Dash (2) LSAM; ST. TAMMANY PAR., Abita Creek Preserve, 30° 31' 25" N 89° 58' 07" W, FIT/MT, Woods, Longleaf Savanna, wet pine flatwoods, D. Prowell (95)PCOL; Abita Creek Preserve 30° 31' 25" N 89° 58' 07" W, FIT/MT, Open, Longleaf Savanna, wet pine flatwoods, D. Prowell (157) PCOL; Abita Spring, Money Hill Golf Course, 30-May-2000, Pitfall trap, A. M. Pranschke (2) FAFC; Abita Spring, Money Hill Golf Course, 30-May-2000, pitfall, A. M. Pranschke (2) LSAM; Abita Spring, Money Hill Golf Course, 3-Aug-2000, Pitfall trap, A.M. Pranschke (1) LSAM; Abita Spring, Money Hill Golf Course, 14-Jun-2000, Pitfall trap, A.M. Pranschke (1)LSAM; Abita Spring, Money Hill Golf Course, 28-Jun-2000, Pitfall trap, A.M. Pranschke (1) LSAM; Abita Springs, Abita Creek Flatwoods Pres., 2-Sep-2000, Pitfall trap, A. M. Pranschke (2) STDC; Abita Springs, Abita Creek Flatwoods Pres., 6-Jun-2000, Pitfall trap, A.M. Pranschke (1) LSAM; Abita Springs, Abita Creek Flatwoods Pres., 8-Sep-2000, Pitfall trap, A.M. Pranschke (1) LSAM; Lake Ramsay Preserve WMA, 30° 31' N 90° 10' W, Pitfall, Longleaf Pine Savannah, D. Colby(9) PCOL; Pearl River, John Authon Rd, 5-Oct-2002, by hand, L. A. Womack (1) STDC; TANGIPAHOA PAR., Arcola, Sandy Hollow WMA, 7-Sep-2002, sweep net, D. M. Chouljenko (1) LSAM; Arcola, Sandy Hollow WMA, 9-Sep-2003, pitfall, Plot # 5 Trap#3, Longleaf Pine Savanna, K. E. Landry (1) W. FELICIANA PAR., 15 mi E. St. Francisville Feliciana Preserve, 25-Sep-02-Oct-1996, baited pitfall, ENTM 4005 (1) LSAM; Feliciana

Preserve, 9-15-mar-2003, Flight Intercept Trap Hardwood forest, A. Tishechkin (1) LSAM;
 Feliciana Preserve, 30°47' N 91°15' W, 15-Mar—14-Apr-2003, Flight Intercept Trap, A.
 Tishechkin (1) FAFC; WEBSTER PAR., Army ammo plant, 20-Jun-1995, pitfall w/rotten chicken,
 D. R. Ganaway & V. L. Moseley (5) LSAM; WINN PAR., 1/2 mi NW Packton on LA 167, 92° 35'
 N 31° 48' W, 28-May-2004, sweeping composite and yucca, S. T. Dash (1) STDC.

Formicini

Formica Linnaeus, 1758

Generic Diagnosis and Natural History and Natural History Description based on Smith (1947). Small to very large-size ants. Many species are polymorphic. Coloration is variable. A hyperdiverse group in the Nearctic. Antennae 12-segmented. The antennal insertions in close proximity, to the posterior clypeal border. The first segment of the funiculus as long as the following two segments. The frontal carinae distinct. Eyes large with the ocelli present.

Generic Distribution > 290 total species (Bolton 1995); 96 nearctic species. The two species encountered in this study were of the *pallidefulva* group which is currently in revision by Trager (pers. com.). In this paper Trager includes a description of a new species. It is likely that after this revision is published a revulation of the *Formica* in Louisiana will need to be made. The species in this group are yellow to tan ants, that have a smooth and shiny appearance. This group tends to be a slender appearing *Formica*. They live in open habitats.

Key to Species Creighton 1950.

- 1 Petiole in profile strongly convex from base to apex ,the apex evenly convex lacking an angular upper edge..... *Formica schaufussi* (Fig. 204)
- 1' The petiole in profile moderately convex, the apex forms a distinct angle usually with a sharp dorsal edge *Formica pallidefulva* (Fig. 205)

Species Recorded from Louisiana (two)

Formica pallidefulva pallidefulva Latreille, 1802

Formica pallide-fulva Latreille, 1802

Formica pallide-fulva var. *succinae* Wheeler, 1904

Diagnosis Refer to Trager Revision of the nearctic edemic formica fallidefulva group at currently it has been expected for publication but the author does not have a copy of the article that would outline a complete diagnosis.

Natural History Colonies nest in the soil under objects such as stones (Cole 1940). Warren and Rouse (1969) collected it in lawns, soybean fields, and orchards in Arkansas. Smith (1918) found colonies at the base of trees in Mississippi as well as in soil, under stones, open fields, and pastures. This species may serve as slaves for *Polyergus lucidus*. In Louisiana it has been collected in longleaf-pine-savannahs with use of pitfall, flight intercept, and bait traps. *Formica pallidefulva* has been collected in the east gulf-coastal plain longleaf-pine forest ecoregion.

Range New York, Ohio, West Virginia, North Carolina south to Florida, Texas, Oklahoma, Colorado, and Arkansas (Smith 1979).

Distribution in Louisiana St. Tammany Parish (fig. 216).

Label Data ST. TAMMANY PAR., Lake Ramsay Preserve WMA, 30° 31' N 90° 10' W, Pitfall, Longleaf Pine Savannah, D. Colby(31) PCOL; Lake Ramsay Preserve WMA, 30° 31' N 90° 10' W, Baits, Longleaf Pine Savannah, D. Colby(92) PCOL; Lake Ramsay Preserve WMA, 30° 31' N 90° 10' W, Baits, Longleaf Pine Savannah, D. Colby(32) PCOL.

Formica schaufussi Wheeler, 1904

Formica pallide-fulva schaufussi var. *merdionalis* Wheeler, 1904

Formica pallide-fulva schaufussi var. *dolosa* Wheeler, 1912

Diagnosis Refer to Trager Revision of the nearctic edemic formica fallidefulva group at currently it has been expected for publication but the author does not have a copy of the article that would outline a complete diagnosis. .

Natural History Colonies nest in the soil under objects such as stones (Cole 1940). Warren and Rouse (1969) collected *F. schaufussi* in pine and Oak-Hickory forest in Arkansas. Dennis (1938) found it in open areas in Tennessee In Louisiana it has been collected in open canopy longleaf pine savannas, and along road sides while sweeping aster and yucca flowers. *Formica schaufussi* has been collected by sweeping, lights, and bait traps. It can be found in the following ecoregions: west gulf-coastal plain longleaf-pine forest, Mississippi River alluvial plain and east gulf-coastal plain longleaf pine forest.

Range Virginia, south to Florida Louisiana, Texas north to Colorado and Nebraska (Smith 1979).

Distribution in Louisiana Bienville, East Baton Rouge, Grant, Rapides, and Tangipahoa Parishes (fig. 227).

Label Data BIENVILLE PAR., Lucky Rt 9, 28-May-2004, sweeping composite and yucca, S. T. Dash (1) STDC; E. BATON ROUGE PAR., Baton Rouge, 10-12 1936, C. L. Smith (1) LSAM; Baton Rouge, 11-12 1936, C. L. Smith (1) LSAM; GRANT PAR., 5 km south Camp Grant Walker, 1-Jun-2004, sweeping road side composites, S. T. Dash (1) LSAM; RAPIDES PAR., Pineville, light trap, J. Moser (2) SRSS; TANGIPAHOA PAR., Arcola Sandy Hollow WMA, 27-Jun-2004, Food Trap, Vienna Sausage, Open Canopy, longleaf pine Savannah, Li Zou (46) STDC/LSAM/FAFC; Arcola, Sandy Hollow WMA, 23-Jul-2004, Vienna sausage, open, Longleaf pine Savanna, Li Zou (11) LSAM/STDC.

Polyergus Latreille, 1804

Generic Diagnosis and Natural History and Natural History Similar to *Formica* in general appearance. A concolorous brown-tan ant. The mandibles lack strongly delineate teeth and are sickle-shape. Antennae are 12-segmented and the scapes are enlarged at the distal portion. Antennal scapes surpassing the occipital border. The antennal insertions are in close proximity to the posterior edge of the clypeus. Eyes and ocelli present. Mesosoma with an obvious impression at the mesoepinotal suture. Gastric hairs not dense and widely spaced. *Polyergus* displays a unique form of social parasitism that is slave making or dulosis. Dulosis occurs when one species' workers raid the colony of a related species for their brood. This stolen brood is raised in the nest of the parasitic species by workers of the host species (Hölldobler and Wilson 1990; Trager and Johnson 1985). The host species carries out all the work of the colony (i.e. acting as nurses, foragers, defenders and the construction force). In this system two divisions are present: obligate and facultative slave-makers.

Generic Distribution seven (?) Total species (Bolton 1995); three nearctic species.

Polygerus lucidus lucidus Mayr, 1866

Diagnosis Similar in appearance to *Formica*. Medium-sized yellow tan shiny ant. The antennal scapes elongate and surpass the occipital border. The hairs on the gaster not dense, widely spaced (MacKay and MacKay 2002).

Natural History *Polygerus lucidus* is an obligate slave maker. *Polygerus lucidus* is likely to makes slaves out of *F. pallidefulva pallidefulva* and *F. schaufussi* in Louisiana because, those are the only species collected in the same area as *P. lucidus*. *Polygerus lucidus* is not commonly collected in Louisiana. It has been only collected in longleaf pine-savannah.

Polyergus lucidus can be found in the Mississippi River alluvial plain and the east gulf-coastal plain longleaf-pine forest ecoregions.

Range Massachusetts south to Florida west to Colorado and New Mexico (Smith 1979, Trager and Johnson 1985).

Distribution in Louisiana St. Tammany and West Carroll Parishes (fig. 228).

Label Data ST. TAMMANY PAR., Lake Ramsay Preserve WMA, 30° 31' N 90° 10' W, Pitfall, Longleaf Pine Savannah, D. Colby (6) PCOL; W. CARROLL PAR., Oct-1972, S. C. Ferguson Jr. (2) LSAM.

LASIINI

Lasius (F.)

Generic Diagnosis and Natural History and Natural Hisotry Small to medium sized ants. Description based on Smith (1947). The antenna 12-segmented and lacking an apical club. The antennae insertions are in close proximity to the posterior edge of the clypeus. Ocelli may be present or absent. The petiolar scale is distinct. There are three subgenera in the nearctic region (Smith 1949). Nests are located in decayed wood, soil, or under rocks. The workers are carnivorous in nature however, a large portion of the diet comes from honey dew. The species in the genus are similar in behavior to *Brachymyrmex*; both tend aphids that feed on plants roots. Behavior of farming aphids because of this some species to be considered pestiferous (Smith 1965).

Generic Distribution >100 total species (Bolton); 18 nearctic species (Wilson 1955, Smtih 1979).

Lasius alienus (Foerster, 1850)

Formica aliena Foerster, 1850

Prenolepis lasiodies Emery, 1869

Prenolepis fuscula Emery, 1869

Lasius niger var. *americanus* Emery, 1893

Lasisus niger alienus var. *grandis* Forel, 1909

Lasisus niger alienus var. *alieno-americanus* Wheeler, 1917

Lasius niger turcicus Santchi, 1921

Lasisu niger lasiodies var. *barbara* Santchi, 1921

Acanthomyops niger alineus

var. *flavidus* Kuznetzov-Ugamskij, 1927

Acanthomyops niger alineus

var. *turkmenus* Kuznetzov-Ugamskij, Smith, 1927

Lasus brunneus var. *obscurata* Stitz, 1930

Lasius alienus illyricus Wimmerman, 1934

Lasius alienus var. *pannonica* Roszler, 1942

Lasius alienus var. *pontica* Starcke, 1944

Species Diagnosis Small ants that vary from light brown to almost black. Antennal scape as well as tibiae without erect or suberect hairs. The midline of anterior border of the clypeus forming an even broad lobe. The penultimate and terminal basal tooth subequal in size to distance between the teeth equal to the terminal tooth (Wilson 1955).

Natural History Warren and Rouse (1969) found uncommon in Arkansas. *Lasius alienus* is found in the east gulf-coastal plain longleaf-pine forest ecoregions in Louisiana. Within this ecoregions occurs in wet pine flatwoods, longleaf-savanna woodlands and in shaded woodlands. The nests are under rocks, in decayed logs, and stumps (Wilson 1955).

Range Widespread in North America and in Eurasia, North Africa, Latin America (Wilson 1955). Nova Scotia south to Florida west to British Columbia and California but absent from the Rockies (Smith 1997).

Distribution in Louisiana St. Tammany Parish (fig. 229).

Label Data ST. TAMMANY PAR., Abita Creek Preserve, 30° 31' 25" N 89° 58' 07" W FIT/MT, Woods, Longleaf Savanna, wet pine flatwoods, D. Prowell (8) PCOL; Abita Creek Preserve, 30° 31' 25" N 89° 58' 07" W, Bait, Woods, Longleaf Savanna, wet pine flatwoods, D. Prowell (1) PCOL.

PLAGIOLEPIDINI

***Brachymyrmex* Mayr, 1868**

Generic Diagnosis and Natural History and Natural History A new world genus of very small, monomorphic ants. The integument is flexible and is similar to that of many dolichoderines. The antenna is composed of nine segments and lacks a club. The eyes are well developed. The pilosity is sparse or lacking on the thorax, head, and gaster when present it is often appressed to slightly raised. The petiolar scale is small. Nests are commonly found in soil, under rocks, bark, and in rotten logs. One of the most neglected formicid genera in the New World; this “miserable” genus, as Creighton (1950) commented, has long been considered in need of revision (Deyrup *et al.* 1988, MacKay and Vinson 1989, Smith 1947). The workers are mostly subterranean in habit and derive much of their food from honey dew obtained from aphids and scales on the roots of plants. Like *Brachymyrmex* taxonomy, a review of the genus’ natural history is needed as well.

Generic Distribution 38 Global species;? nearctic species.

Key to Species (based on M. Deyrup per. com and Santschi 192)).

- 1 Pale colored ants, Yellowish ants that lack standing hairs..... *Brachymyrmex depilis* (fig. 208)
- 1' Dark colored ants.....2
- 2 Brown ants, with more than four erect hairs on the dorsal surface of the mesosoma
- *Brachymyrmex obsurior* (fig. 210)
- 2' Dark brown ant, with usually only four erect hairs on the dorsal surface of the mesosoma
- *Brachymyrmex musculus* (fig. 209)

Species recorded from Louisiana (three?)

Brachymyrmex depilis (Emery, 1893)

Brachymyrmex heer depilis Emery, 1893

Brachymyrmex nanellus Wheeler, 1903

Brachymyrmex depilis flavesus Grundmann, 1952

Species Diagnosis Description from Santschi (1923). Very small to small, yellow ant that lacks erect hairs. The mandibles with a fine edge that is brown. Pubescence nearly lacking with only a few erected hairs on the body; and a few hairs towards the mouth and the end of the abdomen. Head wider than long, with slightly convex sides. Eyes with 16 to 20 facets. The scape only slightly surpassing the posterior edge of the head. The sutures of the metaepinotum reduced or not visible. *Brachymyrmex depilis* is thought to be the only light yellow *Brachymyrmex* in the nearctic region (Deyrup *et al.* 1988).

Natural History Largely subterranean in nature, nests are found in the soil (Cole 1940). Cokendolpher and Francke (1990) found that most of the nests were in the sandy loam, silt loam and sandy clay soil types in western Texas. Van Pelt (1958) found the nests were located in sandy soil associated with wood or roots of shrubs. Nests have also been noted in close proximity to *Crematogaster punctulata*, under rocks, leaf litter, cotton fields, and cattle dung as

well as under a can and stick (Warren and Rouse 1969, Cokendolpher and Francke 1990). In addition to these sites, Van Pelt (1958) found them at bases of trees, stumps, and palmetto roots in Florida. Van Pelt (1958) found the species in flatwoods in the Florida panhandle. This study found the species in the following habitats: longleaf-pine savannas, wet pine flat woods, beech-magnolia upland, cypress swamp, urban habitat, upland mixed-hardwoods, and zoological park. *Brachymyrmex depilis* is found in the southeast mixed pine hardwood forest, east gulf-coastal plain longleaf-pine forest coastal marsh, and Tunica loess hills ecoregions. I have collected portions of colonies by sifting log material and leaf litter. Specimens have also been collected with flight intercept traps, pitfalls traps, and baits.

Range Widespread. Nova Scotia south to Florida west to British Columbia and California (Smith 1979).

Distribution in Louisiana E. Baton Rouge, St. Tammany, Orleans, and W. Feliciana Parishes (fig. 230).

Label Data CALCASIEU PAR., Nr. Moss Bluff, Sam Houston Jones St. Park, ?-Jul-2003, S. T. Dash (1) STDC; E. BATON ROUGE PAR., Baton Rouge, Bluebonnet Swamp, N 30 22.14' W9106.30, 1-Jul-2003, Sifting log matter, Beech Magnolia upland cypress swamp, S. T. Dash (3) STDC; Baton Rouge, Spanish Town Guanrisco, 19-May-1999, Ant vials, L. M. Hooper-Bui(5) FAFC; Baton Rouge, Spanish Town ST 2, 23-Sep-1999, Secret Ant Diet, L. M. Hooper-Bui (4) FAFC; Baton Rouge, Spanish Town ST 5, 23-Sep-1999, Ant vials, L. M. Hooper-Bui (8) LSAM; Baton Rouge, Spanish Town ST 6, 23-Sep-1999, Ant vials, L.M. Hooper-Bu (8) STDC; Baton Rouge, Spanish Town ST 8, 23-Sep-1999, Ant vials, L. M. Hooper-Bui (2) STDC; Baton Rouge, Spanish Town ST 9, 7-Apr-1999, L M Hooper (1) FAFC; Baton Rouge, Spanish Town ST 9, 27-Apr-2000, Ant vials, L. M. Hooper-Bui (3) STDC; Baton Rouge, Spanish Town Zizi

Back, 20-Aug-1999, Ant vials, L. M. Hooper-Bui (10)FAFC; Baton Rouge, Spanish Town, Colonel, Lawrence, 23-Sep-1999, L. M. Hooper (1)FAFC; Baton Rouge, Spanish Town, Colonel Lawrence, 24-Aug-2000, Peanut butter Trap, L. M. Hooper (1) FAFC; Baton Rouge, Spanish Town Interstate 10 Ramp, 23-May-2000, Honey trap, L. M. Hooper (2) FAFC; ORLEANS PAR., New Orleans Audubon Zoo, 19-Aug-1999, pitfall, Behind Ostrich cage, L.M. Hooper-Bui & A. M. Pranschke (15) STDC/FAFC/LSAM. ST. TAMMANY PAR., Abita Creek Preserve, 30° 31' 25" N 89° 58' 07" W, FIT/MT, Woods Longleaf Savanna, wet pine flatwoods, D. Prowell (2) PCOL; Abita Springs, Abita Creek Flatwoods Pres., 6-Jun-2000, Pitfall trap, A. M. Pranschke (3) FAFC; Lake Ramsay Preserve WMA, 30° 31' N 90° 10' W, Pitfall, Longleaf Pine Savannah, D. Colby(2) PCOL; Lake Ramsay Preserve, WMA 30° 31' N 90° 10' W, FIT, Longleaf Pine Savannah, D. Colby(8) PCOL; Money Hill Golf Course, Abita Springs, 25-Feb-2003, A. M. Pranschke (1) FAFC; TANGIPAHOA PAR., Arcola, Sandy Hollow WMA, 9-Sep-2002, Pitfall trap, Plot # 1, Trap # 3 Longleaf Pine Savanna, K. E. Landry (1)FAFC; W. FELICIANA PAR., Feliciana Preserve, 30°47' N 91° 15' W, 18-Sep-2002, sifting leaf litter, A. R. Cline & A. Tishechkin (1) LSAM; N. St. Francisville, Tunica Hills WMA, 31-Jul-1999, sifting litter, Upland Hardwood, J. L. Johnson & T. D. Fassbender (4) STDC.

Brachymyrmex musculus Forel, 1899

Brachymyrmex tristis var. *musculus* Forel, 1899

Diagnosis Description from Santschi (1923). Very small, shiny black-brown ants. Hairs very sparse. The tarsi and mandibles pale; the antennae are a brownish-yellow. Pubescence rather long. The head rectangular longer than wide the edges not very convex. The second to last funicular segments longer than wide; the first segment longer than the remaining segments. The median ocellus distinct. The scape surpasses the posterior border of the head. Pronotum wide,

forming an uniform bend on the profile of the mesonotum. The basal face of the epinotum slightly higher than the preceding segment and almost as long as the declivitous face.

Natural History An exotic species. Wheeler and Wheeler (1978) found a colony living in the saw dust of live oak limb. It has been found in the east gulf coastal plain longleaf pine forest.

Range Introduced into Louisiana and Florida, and perhaps in other gulf coastal states.

Distribution in Louisiana St. Tammany Parish (fig. 231).

Label Data ST. TAMMANY PAR., Madisonville, wayside park 23-Jan-1976, Wheeler and Wheeler (data taken from Wheeler and Wheeler 1978); Abita Creek Preserve, 30° 31' 25" N 89° 58' 07" W, FIT/MT, Woods, Longleaf Savanna, wet pine flatwoods, D. Prowell (42) PCOL; Abita Creek Preserve, 30° 31' 25" N 89° 58' 07" W, FIT/MT, Open, Longleaf Savanna, wet pine flatwoods, D. Prowell (40) PCOL; Lake Ramsay, Preserve WMA, 30° 31' N 90° 10' W, Pitfall, Longleaf Pine Savannah, D. Colby(137) PCOL; Lake Ramsay Preserve WMA, 30° 31' N 90° 10' W, Baits, Longleaf Pine Savannah, D. Colby (359) PCOL; Lake Ramsay Preserve WMA, 30° 31' N 90° 10' W, FIT, Longleaf Pine Savannah, D. Colby (662) PCOL.

Comments: This is given as a tentative report, until proper taxonomic evaluation occurs all information should be “taken with a grain of salt.”

Brachymyrmex obscurior Forel, 1923

Diagnosis Description from Santschi (1923). Lightly brownish ants. The head is shiny and darker than the gaster. The head distinctly longer more than wider, head rectangular. The pubescence is strong and obvious. Declivitous face of the epinotum is smooth. The pilosity especially on the abdomen is weak. Erect pilosity only on the antennae and legs. The eyes with 35 facets, lacking ocelles. The thorax is wide, promesonotum forming a convex area.

Natural History An exotic species. Occurs in both urban and natural areas, such as Longleaf-pine savannas, and city parks. Specimens have been collected with honey bait, pitfall traps and sweeping vegetation.

Distribution in Louisiana East Baton Rouge, Rapides and Tangipahoa Parishes (fig. 232).

Label Data E. BATON ROUGE PAR., Baker, Brooklawn off Hwy 61 Site # 24, 1140, 22-Jun-2003, Ant Vial V. Sausage, J. L. Rosson (2) LSAM; Baker, Country Lane Site 726, 4-Jun-2003, Sweeping old field, Seymour Site 726 (vial), S. T. Dash (25) STDC/LSAM; Baton Rouge Jones Creek Nr Seven Pines, Site # 45, 1325, 24-Jul-2002, Ant Vial Honey, 24-Jul-2002 J. Rosson (6) LSAM; Baton Rouge, BREC Sherwood Forest Park, Site # 36, 0755, 22-Jun-2003, Ant vial Honey, 22-Jun-2003, J. L. Rosson (6) FAFC; Baton Rouge, Hoo Soo Too Rd, Nr Tiger Bend, Site 51, 1350, 12-May-2003, Ant vial V. Sausage, J. L. Rosson (20) LSAM/FAFC; Baton Rouge, Kennyworth & Perkins Rd BREC Perkins park, 3-Apr-2003, Liduidambar styraciflua, S. T. Dash (43) STDC; Baton Rouge, Wandotte & Interstate 110, Site # 34, 1030, 30-Aug-2002, Ant vial V. Sausage, J. L. Rosson (14) LSAM; Baton Rouge, Woodpecker near Devils' Swamp, Site 29, 1040, 22-Jun-2003, Ant Vial Honey, J. L. Rosson (10) FAFC; Zachary, Bankett & Hwy 64, Site # 10, 1740, 10-Oct-2002, Ant Vial Honey, J. L. Rosson (11) LSAM/FAFC; Zachary, Lennon Rd & Pride Port Hudson, Site 4, 1355, 22-Aug-2002, Ant vial Honey, J. L. Rosson (4) LSAM/FAFC; Zachary, Middle and Black Rd, Site # 13 1215, 11-Oct-2002, Ant vial Honey, 11-Oct-2002, J. Rosson (7) LSAM/FAF; Zachary, N. Veronon and Chuckwagon, Site # 2, 1017, 22-Aug-2002, Ant vial Honey, J. L. Rosson (14) LSAM/FAFC; RAPIDES PAR., Woodworth, Alex. ST. For., 5-Aug-2003—19-Oct-2003, Ant vial, Plot #5, Mixed Hardwood For K. E. Landry (7)

LSAM/FAFC; TANGIPAHOA PAR., Arcola, Sandy Hollow WMA, 9-Sep-2002, Pitfall trap, Longleaf Pine Savanna, K. E. Landry, (11) LSAM/FAFC.

Comments: This is given as a tentative report, until proper taxonomic evaluation occurs all information should be “taken with a grain of salt.”

***Paratrechina* Motschulsky 1863**

Generic Diagnosis and Natural History and Natural History Small sized ants. The antennae are 12-segmented and lacking an apical club, the scape surpasses the occipital border by more than half its length. The eyes are distinct with the ocelli being indistinct or absent (Smith 1949). *Paratrechina* may be confused with *Prenolepis*; however *Paratrechina* lacks a mesosomal constriction. Nests occur in the soil, rotten wood material, and under rocks. Colonies occur in a variety of habitats such as woodlands, open fields, and beaches (Trager 1984). The workers tend homopterous insects and are often household pest, that invade in search of foods that contain sugars (Smith 1965).

Generic Distribution 106 Global species; 17 nearctic species.

Species recorded from Louisiana (4):

Paratrechina faisonensis (Forel, 1922)

Prenolepis arenivaga var. *faisonensis* Forel, 1922

Paratrechina vividula Creighton, 1950

Paratrechina melanderi Lynch and Balinsky, 1980

Diagnosis Description from Trager (1984). Uniformly brown to tan colored ants. Conspicuous erect macrochaetae on the scape. The pubescence on the head dense “obscuring sheen of head” (Trager 1984). The mesosoma usually lacking all pubescence; with a shiny appearance.

Natural History Trager (1984) summarize the habitat preference of it as a woodland species, that is common in mixed mesic forest. In Louisiana, it has been collected in longleaf pine-savannas in wet pine flatwoods.

Range New Jersey, south into Florida, west to Louisiana north to Illinois (Trager 1984).

Distribution in Louisiana Calcasieu, Iberia and St. Tammany Parishes (fig. 233).

Label Data CALCASIEU PAR., Sam Houston Jones State Park, 27-Aug-1987, W MacKay (1) MEM; IBERIA PAR., New Iberia, 19-Aug-1987, W. MacKay (1) MEM; ST. TAMMANY PAR., Abita Creek Preserve, 30° 31' 25" N 89° 58' 07" W, FIT/MT, Woods, Longleaf Savanna, wet pine flatwoods, D. Prowell (57) PCOL; Abita Creek Preserve, 30° 31' 25" N 89° 58' 07" W, FIT/MT, Open, Longleaf Savanna, wet pine flatwoods, D. Prowell (57) PCOL; Abita Creek Preserve, 30° 31' 25" N 89° 58' 07" W, Bait, Woods, Longleaf Savanna, wet pine flatwoods, D. Prowell (2) PCOL; Abita Creek Preserve, 30° 31' 25" N 89° 58' 07" W, Bait, Open, Longleaf Savanna, wet pine flatwoods, D. Prowell (3) PCOL; Lake Ramsay Preserve WMA, 30° 31' N 90° 10' W, Pitfall, Longleaf Pine Savannah, D. Colby (375) PCOL; Lake Ramsay Preserve WMA, 30° 31' N 90° 10' W, Baits, Longleaf Pine Savannah, D. Colby (1169) PCOL; Lake Ramsay Preserve WMA, 30° 31' N 90° 10' W, FIT, Longleaf Pine Savannah, D. Colby (66) PCOL; Abita Springs, Abita Creek Flatwoods Pres, 17-Mar-2000, pitfall, A.M. Pranschke (1) FAFC.

Paratrechina longicornis (Latreille, 1802)

Formica longicornis Latreille, 1802

Formica vegans Jerdon, 1851

Formica gracilescens Nylander, 1856

Paratrechina currens Motschulsky, 1863

Diagnosis Description from Trager (1984). A gray to black species, often with bluish reflections. The scapes and legs are very long. Pubescence, short and limited, whitish.

Natural History An exotic species. Found in disturbed areas (Deyrup *et al.* 2000). It is considered omnivorous feeding on dead insects and honey dew (Smith 1924b, 1965). The locomotion of this ant is extremely erratic. It is found in Baton Rouge in urban settings. One interesting point is it was absent from the New Orleans zoo. Among samples which contained numerous exotic species. It was captured with both protein and sugar based bait traps.

Range South Carolina south to Florida west to Texas, tropical cities world wide (Trager 1984).

Distribution in Louisiana East Baton Rouge Parish (fig. 234)

Label Data E. BATON ROUGE PAR., Baton Rouge Spanish Town, 24-Aug-2004, Trap, L. M Hooper (1) FAFC; Baton Rouge, Spanish Town, 24-Aug-2000, bait trap peanut butter, ST-5, L. M. Hooper (1) LSAM; Baton Rouge, Spanish Town, Colonel Lawrence, 20-Aug-1999, Food trap Vienna Sausage. L. M. Hooper (4) FAFC; Baton Rouge, Spanish Town, Ms. Eve, 24-Aug-2000, Honey trap, L. M. Hooper (2) FAFC; Baton Rouge, Spanish Town, ST-9, 23-Sep-1999, Food trap, Vienna Sausage, L. M. Hooper (1) LSAM; Baton Rouge, Spanish Town, Zizi's, 18-Jan-2000, Honey trap, L. M. Hooper (49) LSAM/FAFC; LSU Campus, Life Science Bldg, 27-XI-2002, at large, D. V. Chouljenko (1) LSAM.

Paratrechina parvula (Mayr, 1870)

Prenolepis parvula Mayr, 1870

Prenolepis vividula parvula Forel, 1884

Paratrechina (Nylanderia) parvula Emery, 1925

Diagnosis Description from Trager (1984). A uniformly dark brown to light-brown species. The appendages are often lighter than the body. Scapes short lacking all macrochaetae.

Natural History An exotic species. Found in Florida in open disturbed habitats (Deyrup et. al. 2000). Trager (1984) notes this *P. parvula* is found in open woodlands, along forest edges nest are found in the soil and in logs. Cole (1940) found it in open woodlands, and fields, nest were under stones in the Smoky Mountain in Tennessee. *Paratrechina parvula* was found in the urban environments of Pineville and Baton Rouge, Louisiana, in addition to being collected in an upland longleaf pine savanna.

Range Ontario south Florida west to Texas north to North Dakota.

Distribution in Louisiana East Baton Rouge, Natchitoches, and Rapides Parishes (fig. 235).

Label Data E. BATON ROUGE PAR., Baton Rouge, Spanish Town, I10 Ramp, 17-Apr-2001, Food trap Vienna Sausage, L M Hooper (1) LSAM; Baton Rouge, Spanish Town, Ms. Eve, 18-Jun-2000, Food trap, Vienna Sausage, L. M. Hooper (1) FAFC; NATCHITOCHE PAR., Kistachie Nat For, 92° 36' long 31° 14' lat, 11-Jan-1959 on nest *Atta texana*, occupying town ant nest, J Moser (12) SRSS; RAPIDES PAR., Alexandria, 1-Apr-1967, on trail, Moser (10) SRSS; Glenmora, 24-Aug-1962, J C Moser (14) SRSS.

Paratrechina vividula (Nylander, 1846)

Formica vividula Nylander, 1846

Tapinoma vividula (sic) F. Smith, 1858

Prenolepis kincaidi Mayr, 1906

Prenolepis vividula Emery, 1906

Paratrechina vividula Emery, 1925

Diagnosis Description from Trager (1984). A bicolored species, the head and gaster normally a yellowish-brown, the mesosoma is yellow to red-brown. The pubescence on the head limited to the rear half. This pubescence often variable in length and spacing.

Natural History Trager (1984) remarks on the preference of it to be located in open and disturbed areas such as fields, parks, lots, and landscaped environments. In Louisiana, it has been collected in urban environments.

Range North Carolina south through Florida, west to California north to Kansas (Trager 1984).

Distribution in Louisiana East Baton Rouge Parish. The map found in Trager (1984) has three localities in Louisiana, two of which I believe are found in Rapides and Beuregard Parishes (fig. 236).

Label Data E. BATON ROUGE PAR., Baton Rouge, Spanish Town, I10 Ramp, 17-Apr-2001, Honey trap, L M Hooper (3) LSAM; Baton Rouge, Spanish Town, Ms. Eve, 17-Apr-2001, Food trap Vienna Sausage, L M Hooper (2) LSAM.

Prenolepis Mayr, 1861

Generic Diagnosis and Natural History and Natural History Small, monomorphic species. This genus closely resembles the formicine genus *Paratrechina*, both possess 12-segmented antenna lacking a club with very long scape that surpasses the occipital border of the head (this character will separate it from *Lasius*, which has some superficial resemblance). Eyes well developed, lacking ocelli. *Prenolepis* can be distinguished from *Paratrechina* by a strong constriction in mesonotum (Creighton 1950, Smith 1947).

Generic Distribution 11 Global species; one nearctic species

Species recorded from Louisiana (one):

Prenolepis imparis (Say 1836)

Formica imparis Say, 1836

Tapinoma polita Smith, 1855

Formica wichita Buckely, 1866

Prenolepis nitens var. *americiana* Forel 1891

Prenolepis imparis var. *minuta* Emery, 1893

Prenolepis imparis var. *testacea* Emery, 1893

Prenolepis imparis var. *pumila* Wheeler, 1930

Species Diagnosis Generic characters will separate it from all others in Louisiana. Color is variable across ranges as well as time of year. Small-sized ants. The body is smooth and shiny.

Natural History Colonies are found in the soil (Smith 1924). Smith (1916) found it tending many of aphid and scale species in South Carolina. Van Pelt (1958) found it in mesic hammocks, rural areas, flatwoods and turkeys oak woodlands on the Welaka Preserve in Florida. Smith (1924) found it to prefer clay soils in Mississippi. Diet consists of other arthropods, plant juices, sap, and honey dew from homopterous insects. It has been observed that these ants imbibe so much honey they have trouble in locomotion. These workers act as repletes (Smith 1924). In Louisiana, it is found in the longleaf-pine savannas, mixed-hardwood pine forest and mixed-upland-hardwood forest.

Range Connecticut south to Florida west to Arizona and Montana (Smith 1979b).

Distribution in Louisiana Allen, Calcasieu, East Baton Rouge, East Feliciana, Grant, Rapides, Tangipahoa, West Feliciana and Washington Parishes (fig. 237).

Label Data ALLEN PAR., 19-Dec-1966, loblolly pine on bark 8' w B. terebrans, R. S. Pickard (1) SRSS; CALCASIEU PAR., N. Moss Bluff, Sam Houston Jones State Park, 09-Mar-10-

Apr-2003, FIT, A. R. Cline & A. Tishechkin (6) LSAM; N. Moss Bluff, Sam Houston Jones State Park, 30°19' N 93° 16' W 12-Dec-11-Feb-2003 FIT #2, A. Tishechkin (23) LSAM; N. Moss Bluff, Sam Houston Jones State Park, 9-Mar-16-May-2003, FIT #2, (5) LSAM; Nr. Moss Bluff, Sam Houston Jones St. Park, 09-Mar-16-May-2003, FIT #2, A. R. Cline & A. Tishechkin (1) LSAM; E. BATON ROUGE PAR., Baton Rouge, Burden Research Station, 12-Mar-2004, Sweeping shrubs at woodland edge, S. T. Dash (2) LSAM; E. FELICIANA PAR., Camp Avondale 3 mi E. Clinton, 17-Mar-1983, E. G. Riley (3) LSAM; GRANT PAR., Stuart Lake Rec. Area, 10-IV-1984, Pitfall bait with human feces, E. G. Riley (2) LSAM; RAPIDES PAR., Woodworth, Alex. St. For, 30-Oct-2002, Ant vials, Longleaf Pine Savanna, K. E. Landry (3) LSAM; Woodworth, Alex. St. For, 18-Dec-2003, Ant vials, Longleaf Pine Savanna, K. E. Landry (3) LSAM; TANGIPAHOA PAR., Arcola Sandy Hollow WMA, 23-Jun-2004, Vienna Sausage, open, Longleaf Savanna, Plot #0629E Trap #2, Li Zou (13) FAFC; Arcola Sandy Hollow WMA, 23-Jun-2004, Vienna Sausage, open, Longleaf Savanna, Plot #0622I Trap #3, Li Zou (1) STDC; Arcola, Sandy Hollow WMA, 7-Feb-2002—12-Dec-2003, Ant vials, Longleaf Pine Savanna, K. E. Landry (46) STDC/LSAM/FAFC; W. FELICIANA PAR., Feliciana Preserve, 30°47' N 91°15' W, 15-Mar-14-Apr-2003, Flight Intercept Trap, A. Tishechkin (2) LSAM; Feliciana Preserve 6 mi ESE St. Francisville, 30-X-1998, Berelese, J. L. Johnson & T. D. Fassbender (1) LSAM; Tunica WMA 10 mi NE St. Francisville, 23-X-1998, Berelese, J.L. Johnson & T. D. Fassbender (1) LSAM; Charleys Creek, 25-May-1963 (1) LSAM; Little Bayou Sara, 25-May-1963 (3) LSAM; Feliciana Preserve, 30°47' N 91° 15' W, 01-Feb—09-Mar-2003, FIT, Mix upland Hardwood, A. Tishechkin (1) LSAM; Feliciana Preserve, 30°47' N 91° 15' W, 22-Dec-2002—01-Feb-2003, FIT Mix upland Hardwood, A. Tishechkin (9) STDC; WASHINGTON PAR.,

Bogalusa, Bens Creek WMA, 9-Mar-2002—10-Nov-2002, Ant vials, Mixed Hardwood, K. E.

Landry (58) STDC/LSAM/FAFC.



Fig. 194 *Camponotus chromaidoes*



Fig. 195 *C. pennsylvanica*



Fig. 196 *C. impressus*



Fig. 197 *C. impressus*



Fig. 198 *C. obliquus*



Fig. 199 *C. caryae*



Fig. 200 *C. nearcticus*



Fig. 201 *C. americanus*



Fig. 202 *C. atriceps*



Fig. 203 *C. castaneus*



Fig. 204 *Formica schaufussi*



Fig. 205 *F. pallidefulva*



Fig. 206 *Polyergus luciuds*



Fig. 207 *Lasius alienus*



Fig 208 *Brachymyrmex depilis*



Fig 209 *B. musculus*



Fig 210 *B. obscurior*



Fig 211 *Paratrechina faisonensis*



Fig 212 *P. longicornis*



Fig 213 *P. parvula*



Fig 214 *P. vividula*



Fig. 215 *Prenolepis imparis*



Fig. 216 Collection localities for
Camponotus chromaiodes



Fig. 217 Collection localities for
C. pennsylvanica



Fig. 218 Collection localities for
C. impressus



Fig. 219 Collection localities for
C. mississippiensis



Fig. 220 Collection localities for
C. obliquus



Fig. 221 Collection localities for
C. caryae



Fig. 222 Collection localities for
C. nearticus



Fig. 223 Collection localities for
C. americanus



Fig. 224 Collection localities for
C. atriceps



Fig. 225 Collection localities for
C. castaneus



Fig. 216 Collection localities for
Formica pallidefulva



Fig. 227 Collection localities for
F. schaufussi



Fig. 228 Collection localities for
Polyergus lucidus



Fig. 229 Collection localities for
Lasius alienus



Fig. 230 Collection localities for
Brachymyrmex depilis



Fig. 231 Collection localities for
B. musculus



Fig. 232 Collection localities for
B. obscurior



Fig. 233 Collection localities for
Paratrechina faisonensis



Fig. 234 Collection localities for
P. longicornis



Fig. 235 Collection localities for
P. parvula



Fig. 236 Collection localities for
P. vividula



Fig. 237 Collection localities for
Prenolepis imparis

Chapter 4

Discussion

This research represents a preliminary report on the biodiversity, ecology and biogeography of the formicid fauna in Louisiana. This is the first major contribution that incorporates all major revisions and current taxonomy, (i.e. the most up-to-date and comprehensive review of its kind in regards to Louisiana's ants). The only similar research effort for the state was Moser and Blum (1960). Why Louisiana has received little attention by myrmecologist is a mystery. Louisiana has a subtropical climate, diversity of habitats, and is a transition zone for many organisms' east and west distribution limits because of the Mississippi River. Researchers are fortunate that the Louisiana at least has a species list (Moser and Blum 1960), unlike Delaware or Rhode Island which lack any published accounts of ants for those states. A limited number of scientists including as M. R. Smith, J. C. Moser, and M. Blum have giving some attention to a few species such as Texas leaf cutting ant, and currently L. M. Hooper-Bùi and D. Prowell are working on ant diversity in Louisiana. A question that arises is why has Louisiana not received more research attention in regards to its ant fauna?

Two of America's foremost myrmecologist spent significant portions of their careers in close proximity to Louisiana. W. M. Wheeler was in Texas and wrote papers focused on the ant fauna of Texas, Arizona, Maine, and other states. M. R. Smith was living in Mississippi in the 1920s and 1930s, and wrote a long series of papers outlining the species in that state. In 1936, Smith turned his attention to Texas and wrote a paper on the ants of that state. Even though Smith was employed at the Southern Forest

Experiment Station in Pineville Louisiana for a number of years (Moser pers. com.) no publication of Louisiana's species was made until 1960 by Moser and Blum. The early part of both Smith's and Wheeler's careers covered faunistic surveys for numerous states and countries. Nevertheless, no attention was given to Louisiana.

Gary Alpert (pers. com.) noted that Wheeler was a marine embryologist when he started his studies in Texas. He became interested in ant development and parasites of ants during his time there. This interest expanded to all aspects of ant biology and taxonomy. His focus of states in the northeast can be attributed to his having homes in Maine and Connecticut and his close proximity to the southwest facilitated the review of Texas, New Mexico, and Arizona formicid fauna. Smith's interest in states followed a similar theme in that his work was done in areas of interest and expeditions.

Alpert asserts that perhaps logistics were a determinate factor for the lack of collection from Louisiana from the first half of the century. However, Wheeler (1908) makes reference to a few species that he collected from Louisiana. Louisiana has been explored; Brown (1964), Bolton (2000), and MacKay (2000) all cite specimens from many localities in the state.

Faunal survey research for the past five decades have fallen to the wayside (Wilson 2000), which may have contributed to the ants of Louisiana not being addressed after 1960. Nevertheless, there are at least eight recent papers detailing the ants of Florida. Mississippi ants not only have the coverage from Smith's works, but also a webpage (MacGown 2004). Texas has nearly 15 papers covering specific counties, regions, and the whole state. The absence of a current and in-depth review of the Louisiana's ant fauna is apparent and this work fills that gap.

This is a preliminary report on the biodiversity of ants in Louisiana, that outlines distribution and notes on habitats and ecology. The hypothesis that (1) both species composition and species richness have changed since 1960 and (2) species ecology is the same for Louisiana as surrounding states in the southeast, were addressed.

The known number of species of ants in Louisiana has increased but it is unclear if these “new” species are actually new to the state. The increase from 59 known species (Moser and Blum 1960) with the addition of 43 species from published accounts and museum holdings, and 25 unreported species encountered in this study (Appendix D) brings the total ant species in Louisiana to 127 ant species.

Twenty exotic species are recorded for the state: *Pachycondyla stigma*, *Pseudomyrmex gracilis*, *Caridocondyla nuda*, *Cardiocondyla venustula*, *Cardiocondyla wroughtonii wroughtonii*, *Cyphomyrmex rimosus*, *Monomorium pharaonis*, *Pheidole flavens*, *Pheidole moerens*, *Pyramica hexamera*, *Pyramica margarita*, *Pyramica membranifera*, *Solenopsis invicta*, *Strumigenys silvestrii*, *Tetramorium bicarinatum*, *Linepithema humile*, *Tapinomia melanocephalum*, *Brachymyrmex musculus*, *Brachymyrmex obscurior*, and *Paratrechina longicornis*. Three are considered previously unreported: *Pachycondyla stigma*, *Tapinomia melanocephalum*, and *Brachymyrmex obscurior*. All of these are considered to be widely distributed invasive species. Of 20 species of exotics, nine may be considered pestiferous: *Caridocondyla nuda*, *Monomorium pharaonis*, *Pheidole moerens*, *Solenopsis invicta*, *Linepithema humile*, *Tetramorium bicarinatum*, *Brachymyrmex musculus*, *Brachymyrmex obscurior*, and *Paratrechina longicornis*.

The overall composition of the state has likely remained the same. Of the 102 species (59 Moser and Blum in addition to the 43 published/museum species) that were known to have occurred in Louisiana before this study, only 14 species were not encountered:

Gnamptogenys hartmanni, *Neivamyrmex melsheimeri*, *Neivamyrmex moseri*,
Neivamyrmex pauxillus, *Neivamyrmex swainsoni*, *Mycetosoritis hartmanni*,
Pogonomyrmex badius, *Pogonomyrmex barbatus*, *Pogonomyrmex comanche*, *Pyramica bunki*, *Pyramica pillinasis*, *Pyramica pulchella*, *Cardiocondyla venustula*, *Temnothorax schaumii*, *Temnothorax texanus*, *Dolichoderus taschenbergi*, and *Forelius analis*.

The first six species in the list above may not have been encountered because they are not frequently encountered species. *Gnamptogenys hartmanni* has only been collected in the United States five times. MacKay and Vinson (1989) and Cook (pers. com.) have collected this species once each and found that even with more intensive searching they were unable to find any more specimens. Though it was collected a number of times by Echols (1964), it appears to be extremely rare, or at least rarely encountered with the current methods for collecting ants. *Neivamyrmex moseri* has only been collected on few occasions: in the nest of *Atta texana* (three times) and under a rock in Texas (Watkins 1971). *Neivamyrmex melsheimeri*, and *Neivamyrmex swainsoni* are known only from males and during a two year period in Louisiana with numerous blacklight events that overlapped army ant flight periods, only one specimen of any ectionine (*L. coecus*) was encountered by me. Collection of male army ants does not appear to be common in Louisiana. After reviewing specimens from museums collected over the last 25 years fewer and fewer specimens of Ectioninae are documented. Moser (pers. com.) believes that *S. invicta* has negatively affected all the populations of *Labidus* and *Neivamyrmex* in

the state. More effort in directed collection for *N. melsheimeri* and *N. swainsoni* is required to investigate its presence or absence in the state.

The lack of *Pogonomyrmex* specimens has puzzled me for the length of the study. The fact that I did not collect these large, red, and obvious species is not because of lack of sampling or effort. I made trips to areas previously known to have these species and none were located. In theory, a large diurnally active ant would have been noticed. This genus may have been eliminated from the state. The local extirpation of *Pogonomyrmex* species in the state may have been caused by three main factors (1) pesticides, (2) *Solenopsis invicta*, (3) human practices such as introduction of nonnative bunch grasses and pine plantations. Markin et al. (1974) found that after an area was treated with Mirex, *Pogonomyrmex badius* was eliminated from the areas and failed to recolonize a year after treatment. Cook (pers. com.) noted a similar effect with bait pesticides, such as Amdro which were effective in controlling populations of *Pogonomyrmex comanche* to the point of killing off the populations. Cook (2003) observes that *S. invicta* had negative impacts on *P. comanche* populations as well and found that *P. comanche* was not able to sufficiently compete with *S. invicta*. Markin et al. (1974) observed after Mirex treatment other ants were killed for the length of the study and never recolonized the area. But, *S. invicta* was able to recolonize the entire area with higher densities with six months of treatment. The efficiency of colonization of *S. invicta* suggested by Markin et al. (1974) demonstrates the difficulties of native fauna to reestablished or colonize the area. This intense competition effects a many ants species besides that of *Pogonomyrmex*.

An explanation why *P. comanche* was not encountered may also be based on human practices, the small population in Bienville Parish was located in their preferred sandy

open habitat. Moser (pers. com.) noted that the area where they were found is now a pine plantation. Cook (2003) pointed out that this species requires open areas and live better in non-shaded areas.

Why the remaining species have not been collected is not certain, although sampling bias may be a component. With increased number of sifted samples *Pyramica bunki*, *Pyramica pillinasis*, and *Pyramica pulchella* collection are probable. Additional collection from material from galls, under bark, and in trees may lead to the collection of: *Temnothorax schaumii*, *Temnothorax texanus*, *Pseudomyrmex semiole*, and *Dolichoderus taschenbergi*.

Basic ecology is conserved in the ants of Louisiana. Species collected show little differences in regards to broad-scale ecology; they are found in similar macro and mircohabitats from southeast United States. The species accumulation curve does not plateau. This suggests that not enough collections were done to capture all species in the state. Nevertheless, the line is not linear either; which would represent an undersampled fauna (Longino 2000). An increased number of samples is needed to ascertain how close to total number of species were collected.

A more complete list of Louisiana formicid fauna may not only be a product of more samples but also of time. The Texas ant fauna has received considerable attention over the years, for example Wheeler (1907, 1908, 1911), Mitchell and Pierce (1912), Wheeler and Wheeler (1985), Mackay and Vinson (1989), Cokendopher and Franke (1990) and Turner and Cook (1998). Mississippi's ant fauna has also had many years of investigation with Smith (1924, 1927, 1928a, 1928b, 1931, 1932) and is currently under investigation (MacGown 2004). Florida has also had a long period of investigation with Van Pelt

(1958) in addition to more recent studies Deyrup and Trager (1984), Deyrup, Trager and Carline (1985), Deyrup and Trager (1986), Deyrup et al. (2000) The latter publication they report as a product of a decade of survey work. This two-year project is a substantial beginning to the survey of the ants of Louisiana will take years to complete.

One concern is that the entire state was not sampled and more samples from the northern-most and southern-most part of Louisiana are required. Sampling events were limited to public lands, such as wildlife management areas, and state parks, and other easily accessible areas. These wildlife management areas are often managed as pine plantations or for game species (Louisiana Department of Wildlife and Fisheries 2003). The majority of dominate tree species are the same from ecoregion to ecoregion and there is also little diversity in understory species as well (Louisiana Department of Wildlife and Fisheries 2003). The sampling may have occurred in homogeneous environment that may not truly represent the “natural” areas of Louisiana. Whereas state parks have not had the same management practices, they are still relatively disturbed areas, with roads, trails, campgrounds, and human disturbances. With such levels of disturbance and modification of land, there exists a large amount of edge effect. These edge areas are nearly always dominated by *S. invicta*. In fact, *S. invicta* was collected with every method utilized, and even in the center of forested, closed-canopy areas and moss-covered log riparian zones.

Based on regional lists, papers on the biology of southeastern ants, and species revisions, it is likely that 26 (Appendix E) more species will be found in the state. The majority of these are widespread species in the nearctic; many are not only in adjacent states but also in all the states of the southeast or have a nearly bicoastal distribution. An example is *Amblyopone pallipes* (Haldeman). In Mississippi, it occurs in moist

woodlands (Smith 1928) and is relatively common (McGowan pers. com.). Its range is Ontario south to Florida west to California. It has as not been collected in Louisiana even though it is found in all surrounding states. One other example is *Odontomachus brunneus* (Patton) which has a range that includes Alabama east through Georgia south to southern Florida (Deyrup and Cover 2004b). It has not been found in the state; Deyrup and Cover (2004b) note there is no reason why this species would not occur in the state, at least in coastal areas that were not sampled extensively in this study.

Understanding the current state of community composition across habitats in Louisiana was not directly addressed (diversity indices) by this study. However, with the examination of available literature one can elicit some hypothetical possibilities about factors affecting interactions. Three factors that may make major contributions to Louisiana's formicid fauna today are: (1) the presence of two highly successful and aggressive invasive species *I. humile* and *S. invicta*, (2) the widespread use of Mirex in the 1960's and 1970's, and (3) the alternations of the environment from human activities.

Sanders et al. (2003) found that *L. humile* not only reduces the diversity of native species but also reorganizes the ant community. Cook (2003) states his research support the point that invasive species shift the shape community assemblages. He states that *S. invicta* has the potential to "eliminate species that we don't even know exist in parts of the southeastern United States, and that these areas are in danger of losing biodiversity that is as documented." Deyrup and Trager (1984) suggest that introduction of small cryptic species such as *S. rogeri* may effect the population densities of native ant fauna such as *S. louisianae* by causing sifts in the population of food resources, such as Collembola.

Mirex use was widespread in the southern United States an estimated use on 10 million acres a year (Markin et al.1974). In Kistachie National Forest it was applied with airplanes over entire Kistachie districts which extended across the state, and Mirex nearly eliminated *Atta texana* in those areas (Moser pers. com.). Markin et al. (1974) conducted a study of the effects of this pesticide on non-target ant species. In 1971, 1000 ha in Washington Parish was treated with a standard 4x Mirex bait and was applied at 2.5 kg bait per ha. Twenty species were found before treatment (species were located by finding colonies and using bait stations). Only 16 total *S. invicta* workers were found two weeks after treatment down from 3896 workers sampled before treatment. One very interesting observation was made: recolonization of *S. invicta* occurred rapidly; six months after treatment 1000 nest per ha were found, which was “more abundant than before treatment” (Markin et al.1974). *Solenopsis xyloni*, *Pogonomyrmex badius*, *Monomorium minimum*, failed to reestablished after treatment for the rest of the study. Not all species in the treatment area were as dramatically affected. The total reduction of species in Louisiana is unlikely to be solely caused by this bait pesticide however, it may have indirectly contributed to community disassemblage. The Markin et al. (1974) study suggests that *S. invicta* is capable of rapid recolonization of treated areas. It is not known if the native species just inhabit niches or just space, but when they are eliminated and *S. invicta* can reinvaded they do so in excess and dominate an area (Markin et. a. 1974, Baroni Urbani and Kannoowski 1974; Glancey et al. 1976).

Alterations of the environment from human activities that allowed for the spread of invasive species such as *I. humile* and *S. invicta* (Baroni Urbani and Kannoowski 1974, Callcott and Collins 1996). Ant diversity has proven to be responsive to variation in

habitat and SO₂ emission in Australia (Andersen et al 2002). Andersen et al. (2002) note species composition and diversity is altered with increase disturbance.

Another concern was that of limited use of pitfall traps in this study. Pitfall traps were in the original protocol, but yielded few specimens in two sampling events (48 hours sampling period). In 26 pitfalls at two locations, a total of 18 ants were collected. Not utilizing pitfall traps extensively likely limited the species collected. Nocturnal species were less likely encountered and possibly under sampled nevertheless, nocturnal species such as *Camponotus americanus* were collected without use of pitfalls. Martelli et al. (2004) compared sifting to two sizes of pitfall traps in an eastern deciduous forest. They found that their “litter sifting captured over ten times as many individuals as pitfall traps of either size.” Sifting yielded 2,343 specimens and pitfall traps only yielded 292 specimens in their study. Also important is “litter sifting yielded more individuals, species, and more occurrences of most species than did pitfall traps.” This is a compelling justification for continued abandonment of pitfall traps. However, neither method was perfect, failing to “capture all species” and species accumulation curves suggest more species could be collected with a combination of methods (Martelli et al. 2004). A similar result was found in my limited sampling. The fact is pitfall traps are successful, success being measured as capturing ants but, pitfall traps are proficient at sampling abundance and diversity.

In addition to getting approximately 20 ants from 26 pitfall traps that were open for a two-day sampling period, I have found that sifting is more efficient. Though the sample size is small, further investigation is required to give full support to the assertion of sifting is more proficient than pitfall traps. I found that two pitfall traps that were

opened for 8 months (19-Sep-2003—28-Apr-2004) only yielded one unique species [*N. fallax*] out of the 12 collected], that was not collected by one sifting event at the time of the original placement of the traps. In one sampling event pitfall traps were open for a two-day period and collected 50% (n=16) of the species collected with sifting for less than an hour at the same area.

This research project may have potentially benefited from the use of pitfall traps (75 mm wide openings Martelli et al. 2004) as Martelli et al. (2004) found as more methods are used, the likelihood of capturing all species increases. Pitfall traps would have been especially useful in areas where sifting is difficult because of small amounts of litter. Areas such as longleaf pine-savannas would benefit from having pitfall trap transects in place. Flight intercept traps would increase numbers of ants. Data from Sam Houston Jones State Park, Feliciana Preserve, and Kistachie National Forest suggests that flight intercept traps encounter some species that are not found with the other methods used. The specimens are usually alates and workers, with some cases this species were previously not encountered.

The amount of time at each site was minimal. A period of five hours per site was spent. The ants of leaf litter protocol suggests at least two days of intensive and regimented sampling in an area is required to accurately sample an area (Agosti 2000).

I showed a sampling bias against sweeping and baits. I found these methods to be less productive and employed them with less enthusiasm than sifting. Often the same care and consideration for baits was not always used as was for other methods. The reason for the dislike of the widely-used and accepted method of baiting is two-fold. One is baits do not render the same numbers of specimens or diversity as does sifting the same

area per effort. For the species that I collected with baits, all are considered to be generalists. In addition, baiting only captures approximately 14 species and it is not an efficient technique when collecting for alpha diversity. It should be noted one specimen of a *Pyramica* species (which was unidentifiable to species because of being encrusted with dried sausage particles) and > 30 specimens of *Formica schaufussi* were collected at bait. A comparison with Glancey et al. (1976) from a bait sampling study in Mobile county Alabama found a total of 11 species in common with my typical bait trap species. These same 11 species are consistently collected with baits independent of habitat and ecoregion.

I do not prefer baiting because of affects of bait on specimens. The use of honey and Vienna sausage should be abandoned in all studies that require identification and future housing of dry specimens in a dry state. I have seen very few specimens that were clean enough to identify. Most specimens had bait particles on their bodies. In addition, a number had oil on the specimens giving them a moist appearance. The specimens were washed with ethanol before they were mounted but, they still had the aforementioned problems. In addition to the difficulty in identification of the specimens, I have found if the specimens are not properly cleaned, they will rot.

More samples are needed from across the state with attention to areas not previously sampled to proved a very detailed account of ants in the state. This may be accomplished in two methods. Number of statewide transects with sampling points spaced at distances that account for flora or community turnover could be established. The sampling points cannot too far apart as to miss habitats. At these sampling points, a pitfall array would be installed, and areas for sifting, flight intercept traps, bait transects,

and sweeping points would be randomly assigned. These sampling points would be monitored every month for a two-year period. Access to more private lands or areas that are less disturbed and managed is needed. Two-review of Gap Analysis Program (GAP) data that overlays soil types and major vegetation types is necessary. Intensive sampling should focus on ecotones. Potentially, this will collect species that are in two habitats in one location.

One area that needs to be explored is the incorporation of extension and pest control operators. If they can be asked to send samples of ants to LSU ant laboratory. They may add more exotic species. This might achieve a better understanding the distribution of pest or common species.

Other, ideas on future research would include comparisons of collection methods across habitat types and communities in terms of diversity and composition. Comparison of upland longleaf-pine savannas to coastal plain longleaf savannas, or hardwood forest compared to pine savannas would be interesting. Other areas of future investigation should include why some species occur in all communities, and why are some species common and widespread in the United States but are absent from Louisiana .These species include *Odontomachus brunneus* and *Amblyopone pallipes* which who are widespread species in the southern United States. In-depth natural history studies of little known taxa such as *Neivamyrmex moseri* or *Gnamptogenys hartmanni* would also be excellent areas to focus research. Finally, exploration of unique habitats in Louisiana such as the Tunica Hills area and the pine-dominated forest of the central part of the state such as Lucky in Bienville Parish, and Kistachie National Forest areas in Natchitoches and Rapides Parishes is needed. These latter habitats have interesting taxa such as *Atta*

texana, *Gnamptogenys hartmanni*, *Pogonomyrmex comanche*, in addition to having a high diversity of *Neivamyrmex*.

Future research in the state of Louisiana will be much improved with this body of work. I present not only a species list but also keys, descriptions, notes on biology, and distributional maps, which should facilitate future research with ants. This same desire was expressed by Moser and Blum in 1960, but was not realized until 2004. It was found that species composition has not extensively changed since the earliest reports on Louisiana's formicid fauna with only 14 species not collected. Alpha diversity increased from 59 species to 127 known species. It is interesting to note that the hypothesis of 123 (128 before changes in taxonomy are considered) by Moser and Blum (1960) was not significantly off the number found in this survey which was 127 species. I currently estimates the species diversity in the state to include 160 species. The ants in Louisiana demonstrate the basic ecology over their range with a mixture of western and eastern species, with many little-known species that require future research.

Literature Cited

- Agosti, D. 2003. The Social Insects World Wide Webpage, Ants, American Museum of Natural History last update January 31, 2003. <http://research.amnh.org/entomology>.
- Agosti, D., J. D. Majer, L. E. Alonso, and T. R. Schultz. 2000. Ants: Standard Methods for Measuring and Monitoring Biodiversity. Smithsonian Institution Press. Washington D. C. 280 pp.
- Agosti, D., J. D. Majer, and L. E. Alonso. 2000. The ALL protocol: a standard protocol for the collection of ground-dwelling ants. Pp. 204-206. *In* Agosti, D., J. D. Majer, L. E. Alonso, T. R. Schultz. (editors) Ants: Standard Methods for Measuring and Monitoring Biodiversity. Smithsonian Institution Press. Washington D. C. 280 pp.
- Alonso, L. E., and D. Agosti. 2000. Biodiversity studies, monitoring, and ant: an overview. Pp 1-9. *In* Agosti, D., J. D. Majer, L. E. Alonso, T. R. Schultz. (editors) Ants: Standard Methods for Measuring and Monitoring Biodiversity. Smithsonian Institution Press, Washington D.C. 280 pp.
- Anderson, A. N. 1997. Functional groups and patterns of organization in North American ant communities: a comparison with Australia. *Journal of Biogeography* 24: 433- 460
- Anderson, A. N., B. D. Hoffman, W. J. Müller, and A. D. Griffiths. 2002. Using ants as bioindicators in land management simplifying assessment of ant community responses. *Journal of Applied Ecology* 39:8-17.
- André, E. 1885. Species des Hyménoptères d'Europe et d'Algérie 2 (supplément aux fourmis): 833-854. Beaune
- André, E. 1893. Description de quatre espèces nouvelles de fourmis d'Amerique. *Revue d'Entomologie* 12: 148-152.
- ArcView GIS version 3.3 2002. Environmental Systems Research Institution Inc.
- Baroni Urbani, C. and P. B. Kanno. 1974. Patterns in the red imported fire ant settlement of a Louisiana pasture: some demographic parameters, interspecific competition and food. *Environmental Entomology* 3: 755-760.
- Bestelmeyer, B. T., D. Agosti, L. E. Alonso, C. R. F. Brandao, W. L. Brown Jr, J. H.C. Delabie, and R. Silvestre. 2000. Field techniques for the study of ground dwelling ants: an overview, description and evaluation. Pp 122-124. *In* Agosti, D., J. D. Majer, L. E. Alonso, T. R. Schultz. (editors) Ants: Standard Methods for Measuring and Monitoring Biodiversity. Smithsonian Institution Press. Washington D. C. 280 pp.
- Blanchard, C. E. 1846. *In*, Le Règne Animal distribué d'après son organisation, pour servir de

- base à l'histoire naturelle des animaux, et d'introduction à l'anatomie comparée par Georges Cuvier. Les Insectes. 2 Atlas, livraison 234
- Bolton, B. 1979. The ant tribe Tetramoriini (Hymenoptera: Formicidae) the genus *Tetramorium* in the Malagasy region and in the New World Bulletin of the British Museum of Natural History (Entomology) 38:129-181.
- Bolton, B. 1994. Identification guide to the ant genera of the world. Harvard University Press, Cambridge, Massachusetts. 222 pp.
- Bolton, B. 1995. A new general catalogue of the ants of the world. Harvard University Press, Cambridge, Massachusetts. 504 pp.
- Bolton, B. 2000. The ant tribe Dacetini. Memoirs of the American Entomological Institute 65 1028 pp.
- Borgmeier, T. 1939. Nova contribuição para o conhecimento das formigas neotropicas. Revista de Entomologia 10:403-428
- Borgmeier, T. 1940. Duas notas myrmecologicas. Revista de Entomologia 11:606.
- Borgmeier, T. 1953. Vorarbeiten zu einer Revision der Neotropischen Wanderameisen. Studia Entomologica 2:1-51.
- Borgmeier, T. 1959. Revision der Gattung *Atta* Fabricius (Hymenoptera, Formicidae). Studia Entomologica 2: 321-390.
- Brown, W. L., Jr. 1950. Preliminary description of seven new species of the dacetine ant genus *Smithistruma* Brown. Transactions of the American Entomological Society 76: 37-45.
- Brown, W. L., Jr. 1953. Three new ants related to *Strumigenys louisianae* Roger. Psyche 60:1-5
- Brown, W. L., Jr. 1958. A new Japanese species of the dacetine ant genus *Epitritus*. Mushi 31:69-72
- Brown, W. L. 1964. The ant genus *Smithistruma*: a first supplement to the world revision (Hymenoptera: Formicidae). Transactions of the American Entomological Society 89: 183-200.
- Brown, W. L. 1980 (1979). A remarkable new species of *Proceratium*, with dietary and other notes on the genus (Hymenoptera: Formicidae) Psyche 86: 337-346.
- Buckley, S. B. 1860a. The cutting ant of Texas. Proceedings of the Academy of Natural Sciences of Philadelphia 12: 233-236.
- Buckley, S. B. 1860b. *Myrmica* (*Atta*) *molefaciens*, "Stinging Ant" or "Mound-Making Ant," of

- Texas. Proceedings of the Academy of Natural Sciences of Philadelphia 12: 445–447
- Buckley, S. B. 1866 Descriptions of new species of North American Formicidae. Proceedings of the Entomological Society of Philadelphia 6:152-172
- Buckley, S. B. 1867. Descriptions of new species of North American Formicidae. Proceedings of the Entomological Society of Philadelphia 6:335-350.
- Buren, W. F. 1972. Revisionary studies on the taxonomy of the imported fire ants. Journal of the Georgia Entomological Society 7:1-27
- Callcott, A. A., and H. L. Collins. 1996. Invasion and range of imported fire ants (Hymenoptera: Formicidae) in North America from 1958-1995. Florida Entomologist 79: 240-257.
- Carlton, C. E. 1987. Identification of Arkansas fire ant (Hymenoptera: Formicidae: *Solenopsis* spp.) workers. Arkansas Agricultural Experiment Station No. 301: 8 p.
- Carroll, J. F. 1975. Biology and ecology of ants of the genus *Aphaenogaster* in Florida. Ph.D. dissert., University of Florida 177 pp.
- Cokendopfer, J. C., and O. F. Francke. 1990. The ants (Hymenoptera: Formicidae) of western Texas, part II subfamilies Ecitoninae, Ponerinae, Pseudomyrmecinae, Dolichoderinae, and Formicinae. Special Publications, The Museum, Texas Tech University 30: 1-76.
- Cole, A. C., Jr. 1936. Descriptions of seven new western ants. Entomological News 47:118-121
- Cole, A. C. 1940. A guide to the ants of the Great Smoky Mountains National Park Tennessee. The American Midland Naturalist 24: 1-88.
- Colwell, R. K. 2004. Estimates: Statistical estimation of species richness and shared species from samples. Version 7. User's Guide and application published at: <http://purl.oclc.org/estimates>.
- Cook, J. L. 2003. Conservation of biodiversity in an area impacted by the red imported ant, *Solenopsis invicta* (Hymenoptera: Formicidae) Biodiversity and Conservation 12: 187-195.
- Creighton, W. S. 1930. The New World species of the genus *Solenopsis*. Proceedings of the American Academy of Arts and Sciences 66:39-151
- Creighton, W. S. 1950. The Ants of North America. Bulletin of Museum of Comparative Zoology Harvard 104: 585 pp.
- Creighton, W. S. 1967. Living doors. Natural History 76: 71-73.
- Creighton, W. S., and R. Snelling 1974. Notes on the behavior of three species of *Cardiocondyla*

- in the United States (Hymenoptera: Formicidae). Journal of the New York Entomological Society 82: 82-92.
- Cresson, E. T. 1872. Hymenoptera Texana. Transactions of the American Entomological Society 4:153-292.
- Cuezzo, F. 2000. Revisión del género *Forelius* (Hymenoptera: Formicidae: Dolichoderinae). Sociobiology 35: 197-227.
- Curtis, J. 1829. British Entomology; being illustrations and descriptions of the genera of insects found in Great Britain and Ireland 6:211-220
- Dalla Torre, C.G. de. 1892. Hymenopterologische Notizen. Wiener Entomologische Zeitung 11:89-93
- DeGeer, C. 1773. Momoirs pour Servir à l'Histoire des Insectes 3:696 pp. Stockholm.
- Dennis, C. A. 1938. The distribution of ant species in Tennessee with reference to ecological factors. Annals Entomological Society of America 31: 267-307.
- Deyrup, M., and J. Trager 1984. *Strumigenys rogeri* an Afirca Dacetine ant new to the U.S. (Hymenoptera: Formicidae) Florida Entomologist 67: 512-576.
- Deyrup M., J. Trager, and N. Carlin. 1985. The genus *Odontomachus* in the southeastern United States (Hymenoptera: Formicidae). Entomological News 96: 188-195.
- Deyrup, M., and J. Trager. 1986. Ants of the Archbold biological station, Highlands county, Florida (Hymenoptera: Formicidae). Florida Entomologist 69: 206-228.
- Deyrup, M., C. Johnson, G. C. Wheeler, and J. Wheeler. 1989. A preliminary list of the ants of Florida. Florida Entomologist 72: 91-101.
- Deyrup, M., L. Davis, and S. Cover 2000. Exotic ants in Florida. Transactions of the American Entomological Society 126: 295-326.
- Deyrup, M. L. Davis, and S. Cover. 2003. The ponerine ants (Formicidae: Poerinae) of the United States, Draft July 2003 for the Ant Course 62 pp.
- Deyrup M., and S. Cover. 2004a. A new species of the ant genus *Leptohorax* from Florida, with a key to the *Leptohorax* of the southeast (Hymenoptera: Formicidae). Florida Entomologist 87: 51-59
- Deyrup M., and S. Cover. 2004b. A new species of *Odontomachus* ant (Hymenoptera: Formicidae) from inland ridges of Florida, with a key to *Odontomachus* of the United States. Florida Entomologist 87: 136-144

- Donisthorpe, H. 1943. The ants of Waigeu Island, North Dutch New Guinea. *Annals and Magazine of Natural History* (11) 10:433-475
- Donisthorpe, H. 1948. A second instalment of the Ross Collection of ants from New Guinea. *Annals and Magazine of Natural History* (11) 14 (1947):297-317
- DuBois, M. B. 1986. A revision of the native new world species of the ant genus *Monomorium* (*minimum* group) (Hymenoptera: Formicidae). *The University of Kansas Bulletin* 53 65-119.
- Echols, H. W. 1964. *Gnamptogenys hartmani* (Hymenoptera: Formicidae) discovered in Louisiana. *Annals of the Entomological Society of America* 57: 137.
- Edwards, S. R. 1994. The systematics community: priorities for the next decade. *Association of Systematic Collections Newsletter* 15: 37-40.
- Emery, C. 1869. Enumerazione dei Formicidi che rinvenngonsi nei contorni di Napoli. *Annali dell'Accademia degli Aspiranti Naturalisti* (2) 2:1-26
- Emery, C. 1890. Studi sulle formiche della fauna neotropica. *Bulletino della Società Entomologica Italiana* 22: 38-80.
- Emery, 1893. Beiträge zur Kenntnis der nordamerikanischen Ameisenfauna. *Zoologische Jahrbücher. Abtheilung für Systematik, Geographie und Biologie der Thiere* 7: 633-682
- Emery, C. 1894a. Studi sulle formiche della fauna Neotropica. *Bullettino della Società Entomologica Italiana* 26: 137-241.
- Emery, C. 1894b. Estudios sobre las hormigas de Costa Rica. *Anales del Museo Nacional, Costa Rica*. 1889: 45-67
- Emery, C. 1895. Beiträge zur Kenntniss der nordamerikanischen Ameisenfauna. (Schluss.) *Zoologische Jahrbücher. Abtheilung für Systematik, Geographie und Biologie der Tiere* 8: 257-360
- Emery, C. 1900. Formicidarum species novae vel minus cognitae in collectione Musaei Nationalis Hungarici, quas in Nova- Guinea, colonia germanica, collegit L. Biró. *Publicatio secunda. Termézetrajzi Füzetek* 23:310-338
- Emery, C. 1901a. Note sulle doriline. *Bullettino della Società Entomologica Italiana* 33:43-56
- Emery, C. 1901b. Formicidarum species novae vel minus cognitae in collectione Musaei Nationalis Hungarici, quas in Nova-Guinea, colonia germanica, collegit L. Biró. *Publication tertia. Termézetrajzi Füzetek* 25 (1902): 152-160
- Emery, C. 1906. Note sur *Prenolepis vividula* Nyl. et sur la classification des espèces du genre

- Prenolspis. Annales de la Société Entomologique de Belgique 50:130-134
- Emery, C. 1925. In Wytsman, P. Genera Insectorum. Hymenoptera, Fam. Formicidae, subfam. Formicinae. Fasc. 183:302 pp. Bruxelles
- Enzmann, J. 1946a. A new form of Myrmecina. Journal of the New York Entomological Society. 54:13-15
- Enzmann, J. 1946b. *Crematogaster lineolata cerasi*, the Cherry Ant of Asa Fitch (with a survey of the American forms of *Crematogaster*, subgenus *Acrocoelia*). Journal of the New York Entomological Society 54: 89-97.
- Erichson, W. F. 1842. Beitrag zur Insecten-Fauna von Vandiemensland, mit besonderer Berücksichtigung der geographischen Verbreitung der Insecten. Archiv für Naturgeschichte 8: 83-287.
- Erwin, T. L. 1989. Sorting tropical forest canopy samples (an experiment project for networking information). Insect Collection News 2: 8.
- Fabricius, J. C. 1793. Entomologia Systematica emendata et aucta. Secundum classes, ordines, genera, species adjectis synonymis, locis, observationibus, descriptionibus 2:519 pp. Hafniae
- Fabricius, J. C. 1804. Systema Piezatorum: Brunsvigae. 439 pp.
- Fitch, A. 1854. First report on the noxious, beneficial and other insects of the State of New York made to the State Agricultural Society, pursuant to an approbation for this purpose from the Legislature of the State. Transactions of the New York State Agricultural Society 1854: 705-880.
- Foerster, A. 1850. Hymenopterologische Studien 1. Formicariae: 74 pp. Aachen.
- Forel, A. 1879. Etudes myrmécologiques en 1879 (deuxième partie [1 re partie en 1878]). Bulletin de la Société Vaudoise des Sciences Naturelles 16:53-128
- Forel, A. 1885. Etudes myrmécologiques en 1884; avec une description des organes sensoriels des antennes. Bulletin de la Société Vaudoise des Sciences Naturelles 20(1884):316-380
- Forel, A. 1886. Espèces nouvelles de fourmis Américaines. Annales de la Société Entomologique de Belgique. Comptes-rendus 30:xxxvii-xlix
- Forel, A. 1890. Aenictus-Typhlatta découverte de M. Wroughton. Nouveaux genres de formicides. Annales de la Société Entomologique de Belgique. Comptes-rendus 34:cii-cxiv
- Forel, A. 1891. In Grandidier, A. Histoire Physique, Naturelle et Poliique de Madagascar 20.

- Histoire naturelle des Hyménoptères. 2 (fascicule 28). Les Formicides: 1-231. Paris.
- Forel, A. 1893a. Nouvelles fourmis d'Australie et des Canaries. *Annales de la Société Entomologique de Belgique* 37: 454-466.
- Forel, A. 1893b. Formicides de l'Antille St. Vincent. Récoltées par Mons. H. H. Smith. *Transactions of the Entomological Society of London* 1893:333-418.
- Forel, A. 1899a. Fauna Hawaiiensis, or the Zoology of the Sandwich (Hawaiian) Isles 1. Hym. Aculeata: 115-122
- Forel, A. 1899b. *Biologia Centrali-Americana*; or, contributions to the knowledge of the fauna and flora of Mexico and Central America. Insecta. Hymenoptera. 3 (Formicidae): 169 pp. London
- Forel, A. 1901a. Variétés myrmécologiques. *Annals de la Société Entomologique de Belgique* 45:334-382
- Forel, A. 1901b. Nouvelles espèces de Ponerinae. (Aven un nouveau sous-genre et une espèce nouvelle d'Eciton.) *Revue Suisse de Zoologie* 9:325-353
- Forel A. 1904. Fourmis du Musée de Bruxelles. *Annales de la Société Entomologique de Belgique* 48:168-177
- Forel, A. 1909. Fourmis d'Espagne. Récoltées par M. O. Vogt et Mme Cécile Bogt, docteurs en médecine. *Annales de la Société Entomologique de Belgique* 53:103-106
- Forel, A. 1911. Ameisen des Herrn Prof. v. Ihering aus Brasilien (Sao Paulo usw.) nebst einigen anderen aus Südamerika und Afrika. *Deutsche Entomologische Zeithschrift* 1911: 285-312
- Forel, A. 1912. Formicides Néotropiques. Part 2. 3me sous- famille Myrmicinae Lep. (Attini, Dacetii, Cryptocerini). *Mémoires de la Société Entomologique de Belgique* 19:179-209
- Forel, A. 1916. Fourmis du Congo et d'autres provenances récoltées par MM. Hermann Kohl, Luja, Mayné, etc. *Revue Suisse de Zoologie* 24:397-460
- Forel, A. 1922. Glanures myrmécologiques en 1922. *Revue Suisse de Zoologie* 30:87-102
- Gauld, I. D., and B. Bolton. 1988. *The Hymenoptera*. British Museum (Natural History) Oxford University Press, Oxford. 332 pp
- Glancey, D. M., D. P. Wojcik, C. H. Craig, and J. A. Mitchell. 1976. Ants of Mobile County, Alabama, as monitored by bait transects. *Journal of the Georgia Entomological Society* 11: 191-197.

- Gordon, D. M. 1984. The harvester ant (*Pogonomyrmex badius*) midden refuse or boundary? *Ecological Entomology* 9: 403-412.
- Grundmann, A. W. 1952. A new *Brachymyrmex* from northern Utah. *Journal of the Kansas Entomological Society* 25:117
- Haldeman, S. S. 1844. Descriptions of insects, presumed to be undescribed. *Proceedings of the Academy of Natural Sciences of Philadelphia* 2:53-55
- Haldeman, S. S. 1852. Appendix C-Insects pp. 366-378. *In* Stansburg, H. An expedition to the Valley of the Great Salt Lake of Utah: including a description of its geography, natural history, and minerals, and an analysis of its waters: London 487 pp.
- Haskins, C. P. 1928. Notes on the behavior and habits of *Stigmatomma pallipes*, Haldeman. *Journal of New York Entomological Society* 36: 177-184.
- Haskins, C. P. 1931. Notes on the biology and social life of *Euponera gilva* Roger var. *harnedi* M. R. Smith. *Journal New York Entomological Society* 39: 507-521.
- Hölldobler, B. and E. O. Wilson. 1990. *The Ants*. Harvard University Press, Cambridge Mass. 732 pp.
- Holway, D. A., A. V. Suarez, T. J. Chase. 1998a. Loss of intraspecific aggression in the success of a widespread invasive social insect. *Science* 282: 949-952
- Holway, D. A. 1998b Factors governing rate of invasion: a natural experiment using Argentine ants. *Oecologia* 115: 206-212
- Howard, F. W., and A. D. Oliver. 1979. Field observation of ants (Hymenoptera: Formicidae) associated with red imported ants *Solenopsis invicta* Buren in Louisiana pastures. *Journal Georgia Entomology* 14: 159-263.
- Jerdon, T. C. 1851. A catalogue of the species of ants found in southern India. *Madras Journal of Literature and Science* 17:103-127
- Johnson, C. 1988. Species identification in the Eastern *Crematogaster* (Hymenoptera: Formicidae). *Journal of Entomological Science* 23: 314-332.
- Johnson, C. 1989a. Identification and nesting sites of four American species of *Dolichoderus* Lund (Hymenoptera: Formicidae). *Insecta Mundi*. 3: 1-9.
- Johnson, C. 1989b. Taxonomy and diagnosis of *Conomyrma insana* (Buckley) and *C. Flava* (McCook). *Insecta Mundi* 3:179-194
- Jurine, L. 1807. Nouvelle Méthode de Classer les Hyménoptères et les Diptères. *Hyménoptères*

1:319 pp. Geneve

- Kaspari, M. 2000. Chapter 2. A primer on ant ecology. Pp 9-25. *In* Agosti, D., J. D. Majer, L. E. Alonso, T. R. Schultz. (editors) *Ants: Standard Methods for Measuring and Monitoring Biodiversity*. Smithsonian Institution Press. Washington D. C. 280 pp.
- Kennedy, C. H. 1939. Notes on the hypogaecic ant *Proceratium silaceum*. *Proceedings of Indiana Academy of Science* 48:202-210.
- Kennedy, C. H., & M.M. Schramm, 1933. A new *Strumigenys* with notes on Ohio species. *Annals of the Entomological Society of America*. 26:95-104.
- Kempf, W. W. 1959. A synopsis of the New World species belonging to the *Nesomyrmex*-group of the ant genus *Leptothorax* Mayr. *Studia Entomologica* 2: 391-432.
- Kuznetsov-Ugamsky, N. N. 1927. Materialy po mirmekologii Turkestana. 3. *Russkoe Entomologicheskoe Obozrenie* 21:186-196
- LaSalle, J. and I. D. Gauld, 1993. Hymenoptera: their diversity and their impact on the diversity of other organisms. pp. 1-27. *In* *Hymenoptera and Biodiversity*. LaSalle, J. and I. D. Gauld (editors) CAB International, Wallingford UK 368 pp.
- Latreille, P. A. 1802c. *Histoire Naturelle des Fourmis, et recueil de mémoires et d'observations sur les abeilles, les araignées, les faucheurs, et autres insectes*: Paris.445 pp.
- Linnaeus, C. 1758. *Systema Naturae per regna tria naturae, secundum classes, ordines, genera, species, cum characteribus, differentiis, synonymis, locis*. Editio 10. 1:823 pp. Holmiae
- Louisiana Department of Wildlife and Fishery. 2003 *Wildlife Management Areas*. <http://www.wlf.state.la.us/apps/netgear/index.asp?cn=lawlf&pid=332>
- Longino, J. T. 2000. What to do with the data. pp. 186-203. *In* Agosti, D., J. D. Majer, L. E. Alonso, T. R. Schultz. (editors) *Ants: Standard Methods for Measuring and Monitoring Biodiversity*. Smithsonian Institution Press. Washington D. C. 280 pp.
- Lund, P. W. 1831. Lettre sur les habitudes de quelques fourmis du Brésil, adressée à M. Audouin. *Annales des Sciences Naturelles* 23:113-138.
- MacGown, J. 2004. Formicidae of Mississippi webpage. <http://www.msstate.edu/org/mississippiantmuseum/Researchtaxapages/Formicidaehome.html>.
- MacKay, W. 1995. New distributional records for the ant genus *Cardiocondyla* in the New World (Hymenoptera: Formicidae). *Pan-Pacific Entomologist* 71: 169-172.
- MacKay, W. 2000 A review of the new world ants of the subgenus *Myrafant* (genus *Leptothorax*) (Hymenoptera: Formicidae). *Sociobiology* 36: 265-444.

- MacKay, W. P., D. Lowrie, A. Fisher, E. MacKay, F. Burnes, and D. Lowrie. 1988. The ants of Los Alamos county, New Mexico (Hymenoptera: Formicidae) pp. 79-132. *In* Applied Myrmecology, a World Perspective edited by Vander Meer, R. K.; Jaffe, K.; Cedeno (editors) Westview Press Boulder, Colorado. 741 pp.
- MacKay, W. P. and R. S. Anderson. 1991. New distributional records of the ant genus *Ponera* (Hymenoptera: Formicidae) in North America. *Journal New York Entomological Society* 99: 696-699.
- MacKay, W. P., and R. S. Anderson. 1993. New distributional records for the ant genus *Smithistruma* (Hymenoptera: Formicidae) in the southern United States. *Southwestern Naturalist* 38: 388-389.
- MacKay, W. 2000. A review of the New World ants of the subgenus *Myrafant* (Genus *Leptothorax*) (Hymenoptera: Formicidae) in North American. *Sociobiology* 36: 265-444
- MacKay, W. and E. Mackay. 2002. The ants of New Mexico (Hymenoptera: Formicidae). Edwin Mellen Press, Lewiston, United Kingdom 400 pp.
- MacKay, W. and S. B. Vinson. 1989. Rediscovery of the ant *Gnamptogenys hartmanni* (Hymenoptera: Formicidae) in eastern Texas. *Proceedings of the Entomological Society of Washington* 91: 127.
- Markin, G. P., J. O'Neal, and H. L. Collins. 1974. Effects of Mirex on the general ant fauna of a treated area in Louisiana. *Environmental Entomology* 3:895-898.
- Martelli, M. G., M. M. Ward and A. M. Fraser. 2004. Ant diversity sampling on the southern Cumberland Plateau: a comparison of litter sifting and pitfall trapping. *Southeastern Naturalist* 3: 113-126.
- Mann, W. M. 1920. Additions to the ant fauna of the West Indies and Central America. *Bulletin of the American Museum of Natural History* 42:403-439.
- Mayr, G. 1853. Einige neue Ameisen. *Verhandlungen des Zoologisch-Botanischen Vereins in Wien* 2 (1852): 143-150.
- Mayr, G. 1855. Formicina austriaca. Beschreibung der bisher im österreichischen Kaiserstaate aufgefundenen Ameisen nebst Hinzufügung jener in Duetschland, in der Schweiz und in Italien vorkommenden Ameisen. *Verhandlungen des Zoologisch-Botanischen Vereins in Wien* 5:272-478
- Mayr, G. 1861. Die Europäischen Formiciden. (Ameisen.): Wien 80 pp.
- Mayr, G. 1862. Myrmecologische Studien. *Verhandlungen der k.k. Zoologisch-Botanischen Gesellschaft in Wien* 12:649-776.

- Mayr, G. 1866. Myrmecologische Beiträge. Sitzungsberichte der k. Akademie der Wissenschaften. Mathematisch-Naturwissenschaftliche Classe 53:484-517
- Mayr, G. 1868. In Brauer, F. Reise der Österreichischen Fregatte Novara um die Erde in den Jahren 1857, 1858, 1859, unter den Befehlen des Commodore B. von Wüllerstorff-Urbair. Zoologischer Theil. 2 Abt. Neuropteren: 107 pp. Wien.
- Mayr, G. 1870. Neue Formiciden. Verhandlungen der k.k. Zoologisch-Botanischen Gesellschaft in Wien 20:939-996.
- Mayr, G. 1886a. Notizen über die Formiciden-Sammlung des British Museum in London. Verhandlungen der k.k. Zoologisch-Botanischen Gesellschaft in Wien 36:353-368
- Mayr, G. 1886b. Die Formiciden der Vereinigten Staaten von Nordamerika. Verhandlungen der k.k. Zoologisch-Botanischen Gesellschaft in Wien 36:419-464.
- Mayr, G. 1887. Südamerikanische Formiciden. Verhandlungen der k.k. Zoologisch-Botanischen Gesellschaft in Wien 37:511-632.
- McCook, H. C. 1879. Family Formicidae (pp. 182-189). In Comstock, J. H. Report upon Cotton Insects: 511 pp. Washington
- McCook, H. C. 1881. Note on a new northern cutting ant, *Atta septentrionalis*. Proceedings of the Academy of Natural Sciences of Philadelphia 32 (1880): 359-363.
- Mitchell & Pierce, 1912. The ants of Victoria County, Texas. Proceedings of the Entomological Society of Washington 14: 67-76.
- Moser, J. C., and M. S. Blum. 1960. The Formicidae of Louisiana. Insect Conditions in Louisiana (Dept of Entomology, Louisiana State University) 3: 48-50.
- Moser, J. C. 1963. Contents and structure of *Atta texana* nests in summer. Annals of the Entomological Society of America 56: 286-291.
- Moser, J. C. 1967. Mating activities of *Atta texana* (Hymenoptera, Formicidae). Insect Societies 14: 295-312.
- Motschulsky, V. de. 1863. Essai d'un catalogue des insectes de l'île Ceylan. Bulletin de la Société Impériale des Naturalistes de Moscou 36:1-153
- Neelands, R. W. 1959. Exposing the town ant. Forests and People. 9: 18-19.
- Nickle, D. A., and T. M. Neal. 1972. Observations on the foraging behavior of the southern harvester ant *Pogonomyrmex badius*. Florida Entomologist 55: 65-66.

- Norton, E. 1868. Description of Mexican ants noticed in the American Naturalist, April, 1868. Proceedings of the Essex Institute (Communications) 6:1-10
- Nylander, W. 1846. Additamentum adnotationum in monographiam formicarum borealium. Acta Societatis Scientiarum Fennicae 2:1041-1062
- Nylander, W. 1856. Untitled contribution introduced by, "M. L. Fairmaire communique la note suivante de M. Nylander et la Société en décide l'impression dans le Bulletin." Annales de la Société Entomologique de France. Bulletins Trimestriels (3) 4:xxviii
- Olembo, R. 1991. Importance of microorganisms and invertebrates as components of biodiversity. pp. 7-15 *In*: The Biodiversity of Microorganisms and Invertebrates, Its role in sustainable agriculture. Hawksworth, D. L. (editor) CAB International, Wallingford, United Kingdom. 358 pp.
- Oliver, G. A. 1792. Encyclopédie Méthodique. Histoire Naturelle. Insectes 6 (part 2): 369-704. Paris
- Patton, W. H. 1879. A gall-inhabiting ant. American Naturalist 13:126-127
- Roger, J. 1860. Die Ponera-artigen Ameisen. Berliner Entomologische Zeitschrift 4:278-312
- Roger, J. 1863. Die new aufgeführten Gattungen und Arten meines Formiciden-Verzeichnisses, nebst Ergänzung einiger früher gegeben Beschreibungen. Berliner Entomologische Zeitschrift 7:131-214.
- Rösler, P. 1942. Myrmekologische Mitteilungen 1939. Mitteilungen der Arbeitsgemeinschaft für Naturwissenschaften in Fortsetzung der "Verhandlungen und Mitteilungen des Siebenbürgischen Vereins für Naturwissenschaften zu Hermannstadt" 91-91: 27-41
- The Nature Conservancy of Louisiana. 2002. Ecoregions of Louisiana. http://www.louisiananature.org/c4_2.cfm
- Santschi, F. 1918. Sous-genres et synonymies de Cremastogaster. Bulletin de la Société Entomologique de France 1918:182-185.
- Santschi, F. 1919. Nouveaux formicides de la République Argentine. Anales de la Sociedad Científica Argentina 87:37-57
- Santschi, F. 1920. Formicides africains et américains nouveaux. Annales de la Société Entomologique de France 88 (1919): 361-390
- Santschi, F. 1921a. notes sur les fourmis paléarctiques. 2. Fourmis d'Asie Mineure récoltées par M. H. Gadeau de Kerville. Boletín de la Real Sociedad Española de Historia Natural 21:110-116

- Santschi, F. 1921b. Nouvelles fourmis paléarctiques. 3ème note. Boletín de la Real Sociedad Española de Historia Natural 21:165-170
- Santschi, F. 1923. Revue des fourmis du genre *Brachymyrmex* Mayr. An. Museo Nacional de H. Natural De Buenos Aires. 31: 650-678.
- Santschi, F. 1928a. Insects of Samoa and Other Samoan Terrestrial Arthropoda 5. Hymenoptera, Formicidae: 41-58. London
- Santschi, F. 1928b. Nouvelles fourmis d'Australie. Bulletin de la Société Vaudoise des Sciences Naturelles 56:465-483
- Say, T. 1836. Descriptions of new species of North American Hymenoptera, and observations on some already described. Boston Journal of Natural History 1:209-305.
- Sharkey, M. J. 2001. The all taxa biological inventory of the Great Smoky Mountains National Park. Florida Entomologist 84: 556-564.
- Shuckard, W. E. 1840. Monograph of the Dorylidae, a family of the Hymenoptera Heterogyna. Annals of Natural History; or Magazine of Zoology, Botany and Geology 5:188-201
- Smith, C. R. 1937. A taxonomic study of the family Formicidae in the vicinity of Baton Rouge, Louisiana. Master of Science thesis. Louisiana State University. 73 pp.
- Smith, F. 1855. Essay on the genera and species of British Formicidae. Transactions of the Entomological Society of London (2) 3:95-112.
- Smith, F. 1857. Catalogue of the hymenopterous insects collected at Sarawak, Borneo; Mount Ophir, Malacca; and at Singapore, by A. R. Wallace. Journal of the Proceedings of the Linnean Society of London, Zoology 2:42-88
- Smith, F. 1858. Catalogue of Hymenopterous Insects in the collection of the British museum 6 Formicidae: London. 216 pp.
- Smith, F. 1859a. Catalogue of hymenopterous insects collected by Mr. A. R. Wallace at the Islands of Aru and Key. Journal of the Proceedings of the Linnean Society of London, Zoology. 3:132-158
- Smith, F. 1859b. Catalogue of Hymenopterous Insects in the Collection of the British Museum 7 Dorylidae and Thynnidae: 76 pp. London
- Smith, F. 1860a. Catalogue of hymenopterous insects collected by Mr. A. R. Wallace in the Islands of Bachian, Kaisaa, Amboyna, Gilolo, and at Dory in New Guinea. Journal of the Proceedings of the Linnean Society, Zoology 5:(supplement to volume 4)93-143

- Smith, F. 1860b. Descriptions of new genera and species of exotic Hymenoptera. *Journal of Entomology* 1:65-84.
- Smith, F. 1862. Descriptions of new species of aculeate Hymenoptera, collected at Panama by R. W. Stretch, Esq, with a list of described species, and the various localities where they have previously occurred. *Transactions of the Entomological Society of London* (3) 1:29-48
- Smith, D. R. 1979. Family Formicidae pp. 1323-1467 *In* *Catalog of Hymenoptera in America north of Mexico Volume 2.* (editors) K. V. Krombein, P. D. Hurd Jr., D. R. Smith, and B. D. Burks Smithsonian Institute Press, Washington D. C. 1010 pp.
- Smith, M. R. 1916a. South Carolina ants. *Entomological News* 27: 110-111.
- Smith, M. R. 1916b. Observations on ants in South Carolina. *Entomological News* 27: 279-280.
- Smith, M. R. 1918. A key to the known species of South Carolina ants, with notes (Hym.). *Entomological News* 39: 17-29.
- Smith, M. R. 1923a. Two new Mississippi ants of the subgenus *Colobopsis*. *Psyche* 30:82-88
- Smith, M. R. 1924a. An annotated list of the ants of Mississippi (Hym.) *Entomology News* 35: 47-54.
- Smith, M. R. 1924b. An annotated list of the ants of Mississippi (Hym.). *Entomology News* 35: 77-85.
- Smith, M. R. 1927. An additional annotated list of ants of Mississippi with description of a new species of *Pheidole* (Hymenoptera: Formicidae). *Entomology News* 38: 308-314
- Smith, M. R. 1928a. An additional annotated list of the ants of Mississippi (Hymenoptera: Formicidae). *Entomological News*. 39: 16-24.
- Smith, M. R. 1928b. An additional annotated list of the ants of Mississippi with a description of a new species of *Aphaenogaster* (Hymenoptera: Formicidae). *Entomological News* 39: 242-246.
- Smith, M. R. 1928c. An additional annotated list of the ants of Mississippi. With a description of a new species of *Aphaenogaster* (conclusion). *Entomological News* 39:275-279
- Smith, M. R. 1929. Descriptions of five new North American ants, with biological notes. *Annals of the Entomological Society of America* 22:543-551
- Smith, M. R. 1930b. Descriptions of three new North American ants, with biological notes. *Annals of the Entomological Society of America* 23:564-568

- Smith, M. R. 1931a. An additional annotated list of ants of Mississippi (Hymenoptera: Formicidae). *Entomological News* 43: 16-24
- Smith, M. R. 1931c. A revision of the genus *Strumigenys* of America, north of Mexico, based on a study of the workers. *Annals of the Entomological Society of America* 24:686-706.
- Smith, M. R. 1932. An additional annotated list of the ants of Mississippi (Hymenoptera: Formicidae). 42: 157-160.
- Smith, M. R. 1939. The Texas leaf-cutting ant (*Atta texana* Buckley) and its control in the Kisatchie National Forest of Louisiana. U.S.D.A., Southern Forest Experiment Station, Occasional Paper No. 84: 11 pp.
- Smith, M. R. 1942c. The legionary ants of the United States belonging to Eciton subgenus Neivamyrmex Borgmeier. *American Midland Naturalist* 27:537-590
- Smith, M. R. 1944. Ants of the genus *Cardiocondyla* Emery, in the United States. *Proceedings of the Entomological Society of Washington*. 46: 30-41.
- Smith, M. R. 1947 A generic and subgeneric synopsis of the male ants of the United States. *American Midland Naturalist* 30: 273-321
- Smith, M. R. 1951. Formicidae (pp. 778-875). In Muesebeck, C. F. W., Krombein, K. V. & Townes, H. K. *Hymenoptera of America North of Mexico, Synoptic Catalog*. United States Department of Agriculture. Agriculture Monograph 2:1420 pp.
- Smith, M. R. 1952. North American *Leptothorax* of the *tricarinatus-texanus* complex (Hymenoptera: Formicidae). *Journal New York Entomological Society* 40:96-106.
- Smith, M. R. 1962. A new species of exotic *Ponera* from North Carolina (Hymenoptera: Formicidae). *Acta Hymenopterologica* 1: 377-382.
- Smith, M. R. 1963. Notes on the leaf-cutting ants *Atta* spp. of the United States and Mexico. *Proceedings of the Entomological Society of Washington*. 65: 299:302.
- Smith, M. R. 1965. House-infesting ants of the eastern United States, their recognition, biology and economic importance. USDA technical bulletin No. 1326 105 pp.
- Snelling, R. R., and C. D. George., 1979. The taxonomy, distribution and ecology of California desert ants (Hymenoptera: Formicidae). Report for the Bureau of Land Management of California. 333 pp.
- Snelling, R. R., and J. T. Longino. 1992. Reversionary notes on the fungus-growing ants of the genus *Cyphomyrmex*, *rimosus* group (Hymenoptera: Formicidae: Attini) pp. 479-494 *In* *Insects of Panama and Mesoamerica*. D. Quintero and A. Aiello (editors), Oxford University Press. 692 pp.

- Snelling, R. R. 1995. Systematics of Nearctic ants of the genus *Dorymyrmex* (Hymenoptera: Formicidae) Contributions in Science, Natural History Museum of Los Angeles County 54: 1-14.
- Snelling G. C., and R. R. Snelling. 2004. New world army ants. <http://www.armyants.org>.
- Solbrig, O. T. 1991. From genes to ecosystems: a research agenda for biodiversity. International Union of Biological Science, Paris. 123 pp.
- Spinola, M. 1853. Compte rendu des Hyménoptères inédits provenant du voyage entomologique de M. Ghiliani dans la Para en 1846. Memorie della Reale Accademia delle Scienze di Torina (2) 13:19-94.
- Stärcke, A. 1944a. Retouches sur quelques fourmis d'Europe. 3. Autres Lasius. Entomologische Berichten 11:153-158.
- Strandtmann, R. W. 1942. On the marriage flight of *Pogonomyrmex comanche* Wheeler (Hymenoptera: Formicidae). Annals of Entomological Society of American. 35: 140.
- Stitz, H. 1930. Entomologische Ergebnisse der Deutsch-Russischen Alai-Pamir-Expedition 1928. 5. Hymenoptera, Formicidae. mitteilungen aus dem Zoologische Museum in Berlin 16:238-240
- Taber, S. W. 1998. The world of the harvester ants. Texas A & M University Press, College Station Texas pp 213.
- Taber, S. W. 2000. Fire Ants. Texas A & M University Press, College Station Texas pp 308.
- Taylor, R. W. 1967. A monographic revision of the ant genus *Ponera* Latreille (Hymenoptera: Formicidae). Pacific Insects Monographic 13 1-112.
- Thompson, C. R. 1989. The thief *Solenopsis molesta* group, of Florida (Hymenoptera: Formicidae). Florida Entomologist 72: 268-283
- Thompson, C. R., and C. Johnson. 1989. Rediscovered species and revised key to the Florida thief ants (Hymenoptera: Formicidae). Florida Entomologist 72; 697-698
- Trager, J. C. 1984. A Revision of the genus *Paratrechina* (Hymenoptera: Formicidae) of the continental United States. Sociobiology 9: 51-102.
- Trager, J. C. 1988. A revision of *Conomyrma* (Hymenoptera: Formicidae) from the southeastern United States, especially Florida, with keys to the species. Florida Entomologist 71: 11-29.

- Trager, J. C. 1991. A revision of the fire ants *Solenopsis geminata* group (Hymenoptera: Formicidae: Myrmicinae) Journal of the New York Entomological Society 99:141-198
- Trager, J. C., and C. Johnson 1985. A slave-making ant in Florida: *Polyergus lucidus* with observations on the natural history of its host *Formica archboldi* (Hymenoptera: Formicidae). Florida Entomologist 68: 261-266.
- Trager, J. C., and C. Johnson, 1988. The ant genus *Leptogenys* (Hymenoptera: Formicidae, Ponerinae) in the United States. Chp. 4. p 29-34. In Applied Myrmecology, a World Perspective (editors) Vander Meer, R. K.; Jaffe, K.; Cedeno Westview Press Boulder, CO. 741 pp.
- Turner, C. R., and J. L. Cook 1998. The ants (Hymenoptera: Formicidae) of the Caddo Lake region of northeast Texas. The Texas Journal of Science 50: 171-173.
- Umphrey, G. J. 1996. Morphometric discrimination among sibling species in the *fulva-rudis-texana* complex of the ant genus *Aphaenogaster* (Hymenoptera: Formicidae). Canadian Journal of Zoology. 74: 528-559.
- Van Pelt, A. F. 1958. The ecology of the ants of Welaka reserve Florida (Hymenoptera: Formicidae) Part II: annotated list. The American Midland Naturalist 59: 1-60.
- Waller, D. A., and J. C. Moser 1990. Invertebrate enemies and nest associates of the leaf-cutting ant *Atta texana* (Buckley) (Formicidae, Attini). pp. 255-273 In Applied Myrmecology, a World Perspective (editors) Vander Meer, R. K.; Jaffe, K.; Cedeno, Westview Press Boulder, CO. 741 pp.
- Ward, P. S. 1985. The Nearctic species of the genus *Pseudomyrmex* (Hymenoptera: Formicidae). Quaestiones Entomologicae 21: 209-246.
- Warren, L. O., and E. R. Rouse. 1969. The ants of Arkansas. University of Arkansas Division of Agriculture, Agricultural Experiment Station Bulletin 742: 68pp.
- Watkins, J.F. 1968a. A new species of *Neivamyrmex* (Hymenoptera: Formicidae) from Louisiana. Journal of the Kansas Entomological Society 41: 528-531.
- Watkins, J. F. II. 1968b. The rearing of the army ant male, *Neivamyrmex harrisi* (Haldeman) from larvae collected from a nest of *N. wheeleri* (Emery). American Midland Naturalist 80:273-276.
- Watkins, J. F. 1971. A taxonomic review of *Neivamyrmex moseri*, *N. pauxillus*, and *N. leonardi*, including new distribution records and original descriptions of queens of the first two species. Journal of the Kansas Entomological Society 44: 93-103.
- Watkins, J.F. 1976. The identification and distribution of New World army ants (Dorylinae: Formicidae). Marham Press, Fund of Baylor University Press, Waco Texas. 104 pp.

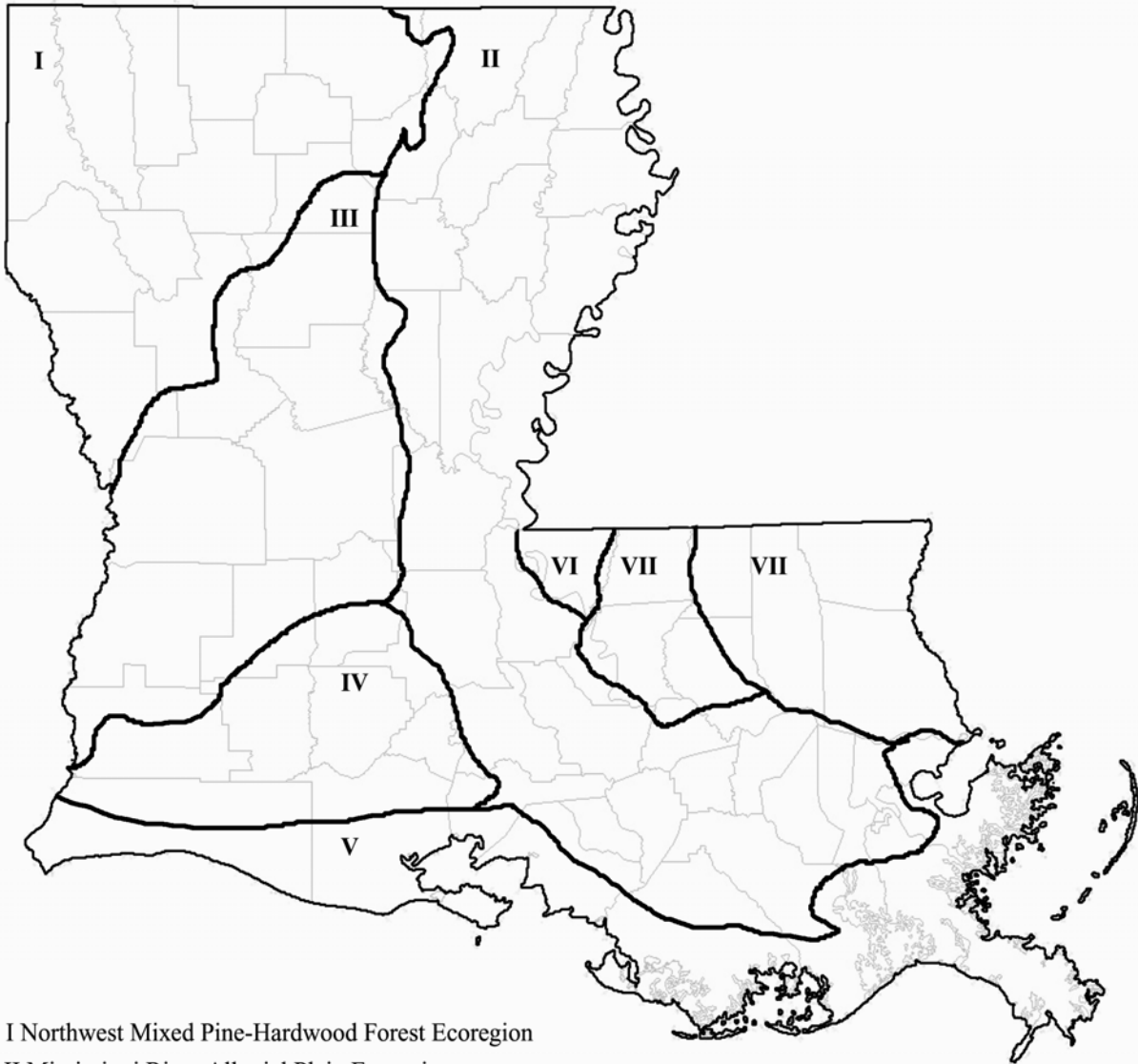
- Watkins, J. F. 1985. The identification and distribution of the army ants of the United States of America (Hymenoptera, Formicidae: Ecitoninae). *Journal of the Kansas Entomological Society* 58:474-502.
- Weber, N. A. 1934a. Notes on Neotropical ants, including the descriptions of new forms. *Revista de Entomologia* 4:22-59.
- Weber, N. A. 1934b. A new *Strumigenys* from Illinois. *Psyche* 41:63-65
- Weber, N. A. 1938a. New ants from stomachs of *Bufo marinus* L. and *Typhlops reticulatus* (L.) *Annals of the Entomological Society of America* 31:207-210
- Weber, N. A. 1958. Nomenclatural changes in *Trachymyrmex*. *Entomological News* 69:243-251.
- Wesson, L. G., and R. G. Wesson, 1939. Notes on *Strumigenys* from southern Ohio, with descriptions of six new species. *Psyche* 46:91-112.
- Wesson, L. G., and R. G. Wesson 1940. A collection of ants from south-central Ohio. *American Midland Naturalist* 24: 89-103.
- Westwood, J. O. 1842. Monograph of the hymenopterous group, Dorylides (No. 5, pp. 73-80). *Arcana Entomologica; or illustrations of new, rare, and interesting insects* 1:192 pp. London
- Wheeler G. C., and J. Wheeler. 1978. *Brachymyrmex musculus*, New Ant in the United States. *Entomology News* 89: 189-190.
- Wheeler G. C., and J. Wheeler. 1985. A checklist of Texas Ants. *Prairie Naturalist*. 17: 49-64.
- Wheeler G. C., and J. Wheeler. 1986. The ants of Nevada. Los Angeles, Natural History Museum of Los Angeles County 138 pp.
- Wheeler G. C., and J. Wheeler. 1990. Insecta: Hymenoptera Formicidae. pp. 1277-1294. *In* D. L. Dindal, (editors) *Soil biology Guide*. John Wiley & Sons, New York. 1429 pp.
- Wheeler, W. M. 1900. A new myrmecophile from the mushroom gardens of the Texan leaf-cutting ant. *American Naturalist* 34: 851-862.
- Wheeler, W. M. 1902.. New agricultural ants from Texas. *Psyche* 9:387-393
- Wheeler, W. M. 1903a. A decad of Texan Formicidae. *Psyche* 10:93-111
- Wheeler, W. M. 1903b. A revision of the North American ants of the genus *Leptothorax* Mayr.

Proceedings of the Academy of Natural Sciences of Philadelphia 55:215-260

- Wheeler, W.M. 1904. A new type of social parasitism among ants. *Bulletin of the American Museum of Natural History* 20:347-375
- Wheeler, W. M. 1905. The North American ants of the genus *Dolichoderus*. *Bulletin of the American Museum of Natural History* 21:321-333
- Wheeler, W. M. 1906. The ants of the Bermudas. *Bulletin of the American Museum of Natural History* 22:347-352
- Wheeler, W. M. 1907. The fungus-growing ants of North America. *Bulletin of the American Museum of Natural History* 23: 669-804.
- Wheeler, W. M. 1908a. The ants of Porto Rico and the Virgin Islands. *Bulletin of the American Museum of Natural History* 24:117-158.
- Wheeler, W. M. 1908b. The ants of Texas, New Mexico, and Arizona. *Bulletin of the American Museum of Natural History* 24: 399-485.
- Wheeler, W. M. 1910a. The North American ants of the genus *Camponotus* Mayr. *Annals of the New York Academy of Science* 20: 295-354.
- Wheeler, W. M. 1910b. The North American forms of *Camponotus fallax* Nylander. *Journal of the New York Entomological Society* 18:216-232
- Wheeler, W. M. 1910c. *Ants: their structure, development and behavior*. Columbia University Press, New York, New York. 663 pp.
- Wheeler, W. M. 1911a. Two fungus-growing ants from Arizona. *Psyche* 18:93-101
- Wheeler, W. M. 1911b. Descriptions of some new fungus-growing ants from Texas, with Mr. C. G. Hartmann's observations on their habits. *Journal of the New York Entomological Society* 19:245-255
- Wheeler, W. M. 1912. New names for some ants of the genus *Formica*. *Psyche* 19:90
- Wheeler, W. M. 1913. Ants collected in Georgia by Dr. J. C. Bradley and Mr. W. T. Davis. *Psyche* 20: 112-117
- Wheeler, W. M. 1915. Some additions to the North American ant fauna. *Bulletin of the American Museum of Natural History* 34:389-421
- Wheeler, W. M. 1917a. The mountain of ants of western North America. *Proceedings of the American Academy of Arts and Sciences* 52:457-569

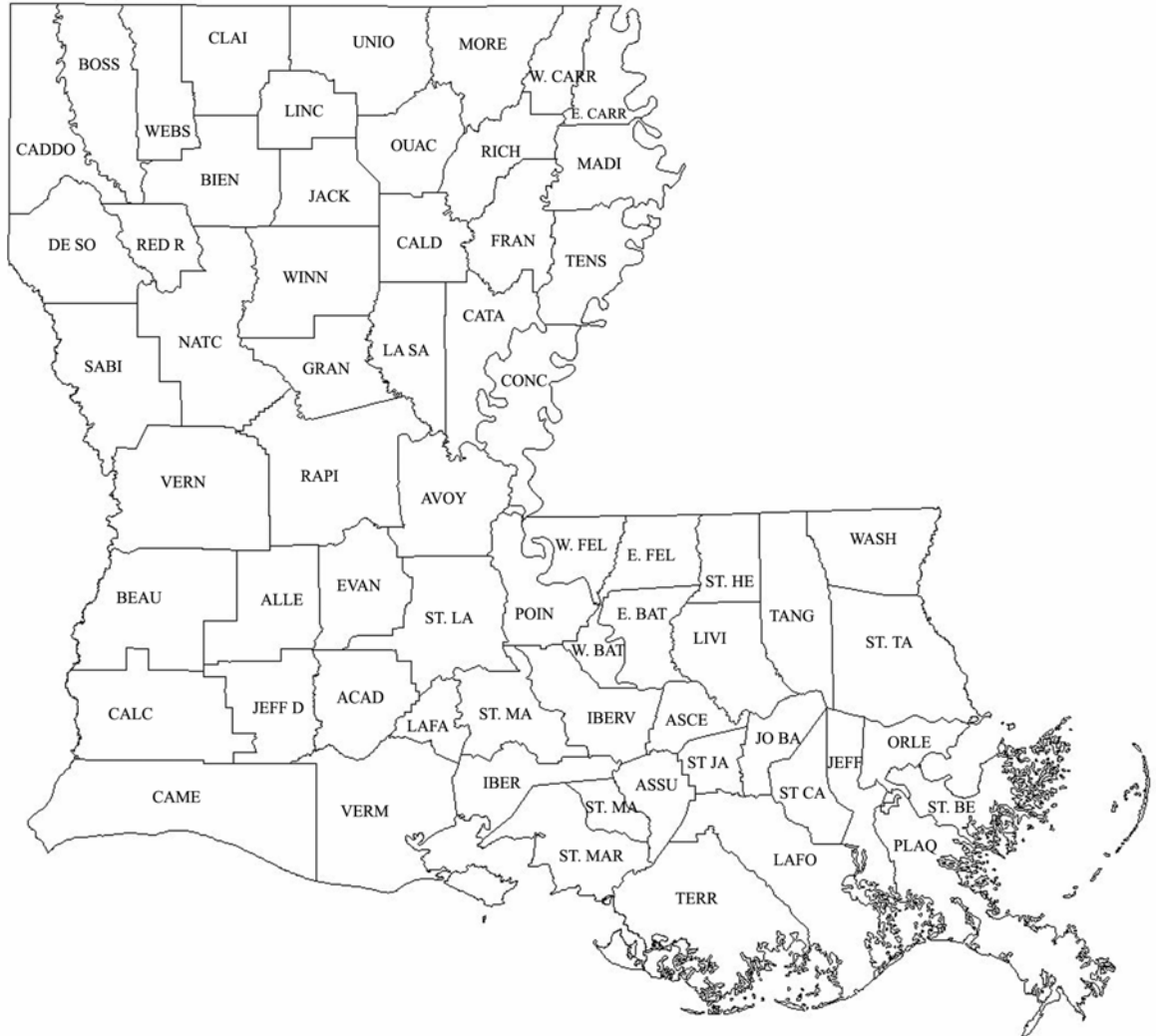
- Wheeler, W. M. 1917b. A list of Indiana ants. proceedings of the Indiana Academy of Science 26:460-466.
- Wheeler, W. M. 1919a. Two gynandromorphous ants. Psyche 26:1-8.
- Wheeler, W. M. 1919b. A new subspecies of *Aphaenogaster treatae* Forel. Psyche 26:50
- Wheeler, W. M. 1919c. A new paper-making *Crematogaster* from the southeastern United States. Psyche 26: 107-112.
- Wheeler, W. M. 1921. Observations on army ants in British Guiana. Proceedings of the American Academy of Arts and Sciences 56:291-328
- Wheeler, W. M. 1925 Neotropical ants in the collections of the Royal Museum of Stockholm. Arkiv för Zoologi 17(A 8):1-55
- Wheeler, W. M. 1929. Ants collected by Professor F. Silvestri in Formosa, the Malay Peninsula and the Philippines. Bollettino del Laboratorio di Zoologia generale e agraria del R. Istituto Superiore agrario di Portici 24: 27-64
- Wheeler, W. M. 1930a The ant *Prenolepis imparis* Say. Annals of the Entomological Society of America 23:1-26.
- Wheeler, W. M. 1930b A new parasitic *Crematogaster* from Indiana. Psyche 37:55-60.
- Wilson, E. O. 1955. A monographic revision of the ant genus *Lasius*. Bulletin of Museum of Comparative Zoology 113:1-201.
- Wilson, E. O. 1985. Biophila. Harvard University Press, Cambridge Massachusetts. pp 158.
- Wilson, E. O. 1992. The Diversity of Life. W.W. Norton & Company, New York, NY. pp. 413.
- Wilson, E. O. 2000. On the future of conservation biology. Conservation Biology 14:1-3.
- Wilson, E. O. 2003. *Pheidole* in the New World a dominant, hyperdiverse ant genus. Harvard University Press, Cambridge, Massachusetts. 794 pp.
- Zimmerman, S. 1935. Beitrag zur Kenntnis der Ameisenfauna Süddalmatiens. Verhandlungen der Zoologisch-Botanischen Gesellschaft in Wien 84 (1934): 1-65

Appendix A Ecoregions in Louisiana



- I Northwest Mixed Pine-Hardwood Forest Ecoregion
- II Mississippi River Alluvial Plain Ecoregion
- III West Gulf Coastal Plain Longleaf Pine Forest Ecoregion
- IV Coastal Prairie Ecoregion
- V Coastal Marsh Ecoregion
- VI Tunica Loess Hills Ecoregion
- VII Southeast Mixed Pine Hardwood Forest Ecoregion
- VIII East Gulf Coastal Plain Longleaf Forest

Appendix B Parishes in Louisiana



Appendix C List of Ants in Louisiana

PONERINAE	<i>Labidus coecus</i>	<i>Crematogaster pilosa</i>
Ponerini	<i>Neivamyrmex fallax</i>	<i>Crematogaster vermiculata</i>
<i>Cryptopone gilva</i>	<i>Neivamyrmex nigrescens</i>	Dacetini
<i>Hypoponera opaciceps</i>	<i>Neivamyrmex melsheimeri</i>	<i>Pyramica angulata</i>
<i>Hypoponera opacior</i>	<i>Neivamyrmex moseri</i>	<i>Pyramica bunki</i>
<i>Leptogenys elongata</i>	<i>Neivamyrmex opacithorax</i>	<i>Pyramica carolinensis</i>
<i>Pachycondyla harpax</i>	<i>Neivamyrmex pauxillus</i>	<i>Pyramica clypeata</i>
<i>Pachycondyla stigma</i>	<i>Neivamyrmex pilosus</i>	<i>Pyramica dietrichi</i>
<i>Ponera exotica</i>	<i>Neivamyrmex swainsoni</i>	<i>Pyramica hexamera</i>
<i>Ponera pennsylvanica</i>	MYRMICINAE	<i>Pyramica hyalina</i>
PROCERATIINAE	Attini	<i>Pyramica margaritae</i>
Proceratiini	<i>Atta texana</i>	<i>Pyramica membranifera</i>
<i>Discothyrea testacea</i>	<i>Cyphomyrmex rimosus</i>	<i>Pyramica metaxytes</i>
<i>Proceratium croceum</i>	<i>Mycetosoritis hartmanni</i>	<i>Pyramica ohioensis</i>
<i>Proceratium pergandei</i>	<i>Trachymyrmex septentrionalis</i>	<i>Pyramica ornata</i>
<i>Proceratium silaceum</i>	Crematogastrini	<i>Pyramica pillinasis</i>
ECTATOMMINAE	<i>Crematogaster ashmeadi</i>	<i>Pyramica pulchella</i>
Ectatommini	<i>Crematogaster atkinsoni</i>	<i>Pyramica reflexa</i>
<i>Gnamptogenys hartmani</i>	<i>Crematogaster cerasi</i>	<i>Pyramica rostrata</i>
ECITONINAE	<i>Crematogaster lineolata</i>	<i>Pyramica talpa</i>
Ecitonini	<i>Crematogaster missouriensis</i>	<i>Strumigenys louisianae</i>

<i>Strumigenys silvestrii</i>	<i>Aphaenogaster lamellidens</i>	PSEUDOMYRMECINAE
Formicoxenini	<i>Aphaenogaster texana-rudis</i>	Pseudomyrmecini
<i>Cardiocondyla nuda</i>	<i>Pheidole dentata</i>	<i>Pseudomyrmex ejectus</i>
<i>Cardiocondyla venustula</i>	<i>Pheidole dentigula</i>	<i>Pseudomyrmex gracilis</i>
<i>Cardiocondyla wroughtonii</i>	<i>Pheidole flavens</i>	<i>Pseudomyrmex pallidus</i>
<i>wroughtonii</i>	<i>Pheidole floridana</i>	<i>Pseudomyrmex seminole</i>
<i>Lepothorax bradleyi</i>	<i>Pheidole metallescens</i>	DOLICHODERINAE
<i>Temnothorax curvispinosus</i>	<i>Pheidole moerens</i>	Dolichoderini
<i>Temnothorax pergandei</i>	<i>Pheidole tetra</i>	<i>Dolichoderus mariae</i>
<i>Temnothorax schaumii</i>	Solenopsidini	<i>Dolichoderus taschenbergi</i>
<i>Temnothorax texanus</i>	<i>Monomorium minimum</i>	<i>Dorymyrmex bureni</i>
Myrmecinini	<i>Monomorium pharaonis</i>	<i>Dorymyrmex grandulus</i>
<i>Myrmecina americana</i>	<i>Solenopsis carolinensis</i>	<i>Forelius analis</i>
Myrmicini	<i>Solenopsis globularia</i>	<i>Forelius pruinosus</i>
<i>Myrmica punctiventris</i>	<i>Solenopsis invicta</i>	<i>Linepithema humile</i>
<i>Pogonomyrmex badius</i>	<i>Solenopsis molesta</i>	<i>Tapinomia melanocephalum</i>
<i>Pogonomyrmex barbatus</i>	<i>Solenopsis pergandei</i>	<i>Tapinomia sessile</i>
<i>Pogonomyrmex comanche</i>	<i>Solenopsis picta</i>	FORMICINAE
Pheidolini	<i>Solenopsis subterranea</i>	Camponotini
<i>Aphaenogaster ashmeadi</i>	<i>Solenopsis tennesseensis</i>	<i>Camponotus (Colobopsis)</i>
<i>Aphaenogaster carolinensis</i>	<i>Solenopsis xyloni</i>	<i>impressus</i>
<i>Aphaenogaster flemingi</i>	Tetramoriini	<i>Camponotus (Colobopsis)</i>
<i>Aphaenogaster fulva</i>	<i>Tetramorium bicarinatum</i>	<i>mississippiensis</i>

Camponotus (Colobopsis) Prenolepis imparis

obliquus

Camponotus americanus

Camponotus atriceps

Camponotus chromaiodes

Camponotus nearcticus

Camponotus pennsylvanicus

Camponotus caryae

Camponotus castaneus

Formicini

Formica pallidefulva

Formica schaufussi

Polyergus lucidus

Lasiini

Lasius alienus

Plagiolepidini

Brachymyrmex depilis

Brachymyrmex musculus

Brachymyrmex obscurior

Paratrechina faisonensis

Paratrechina longicornis

Paratrechina parvula

Paratrechina vividula

Appendix D Records of Species Consider to be Previous Unreported from Louisiana.

PONERINAE

Pachycondyla stigma

PROCERATIINAE

Discothyrea testacea

Proceratium silaceum

MYRMICINAE

Crematogaster ashmeadi

Crematogaster atkinsoni

Crematogaster cerasi

Crematogaster lineolata

Crematogaster minutissima

Crematogaster vermiculata

Pyramica carolinensis

Pyramica hyalina

Pyramica metaxytes

Pyramica reflexa

Cardiocondyla wroughtonii

Myrmecina americana

Aphaenogaster ashmeadi

Pheidole dentata

DOLICHODERINAE

Tapinomia melanocephalum

Tapinomia sessile

FORMICINAE

Brachymyrmex obscurior

Camponotus (Colobopsis) obliquus

Camponotus atriceps

Camponotus chromaiodes

Camponotus nearcticus

Polyergus lucidus

Appendix E Species of Ants That Are Likely to Occur in Louisiana

ECITONINAE

Neivamyrmex carolinensis

Neivamyrmex texana

AMBLYOPONINIAE

Amblyopone pallipes

PONERINAE

Odonotmachus brunneus

Hypoponera inexorata

Hypoponera punctatissima

MYRMICINAE

Aphaenogaster ashmeadi

Aphaenogaster mairae

Apheanogaster tennesseensis

Aphaenogaster miamiana

Pheidole bicarinata

Pheidole crassicornis

Pheidole morrisi

Pheidole pilifera

Pheidole sitarches

Pyramica abdita

Pyramica laevinasis

Pyramica missouriensis

Tetramorium lanuginosum

Tetramorium caespitum

DOLICHODERINAE

Dolichoderus pustulatus

Dorymyrmex smithi

Linepithema iniquum

Forelius mccooki

FORMICINAE

Camponotus pylartes pylartes

Camponotus sansabeanus

Camponotus socius

Formica subsericea

Formica interga

Vita

Shawn T. Dash was born on February 5th 1980, in Baltimore, Maryland. From an early age Shawn exhibited a great interest in biology. He was lucky to have parents who fostered his interest in science with encouragement and support; he developed into a young naturalist. He was very active in high school in the science club, academic club, and was a member of the National Honor Society. He graduated high school (1998) with awards in excellence in science and academic progress. After graduating Shawn attended the University of Delaware, College of Agriculture and Natural Resources, where he earned a degree with distinction in entomology and wildlife ecology with a minor in biological science in May of 2002. While there, Shawn worked on multiple research projects such as mate selection in cucumber beetles, ants of serpentine barren habitats, Delaware Nature Society reptile and amphibian survey; plus he volunteered his time in the UD insect reference collection working as an assistant curator. During Shawn's undergraduate career he also acted as a mosquito taxonomist for the State of Delaware, a laboratory coordinator for the Delaware Nature Society, and helped several graduate students with their research projects. Shawn had two research undertakings of his own focusing on ants; the ants of Delaware and the diversity of ant communities in two forest fragments.

Shawn went to Louisiana State University and completed his master's program in entomology in December of 2004. His thesis research focuses on the species diversity and biogeography of ants in Louisiana. He felt very lucky for the change to study the interesting formicid fauna of the Louisiana. Shawn plans to continue his education and is currently planning to enter into a doctoral program for systematics and taxonomy.