

**A NORTH FLORIDA ANT FAUNA
(Hymenoptera: Formicidae)**

By

Clifford Johnson
Department of Zoology
University of Florida
Gainesville, FL 32611

INTRODUCTION

This paper updates and summarizes the ant fauna of Alachua County, Florida, with two basic objectives. The first objective is presentation of a current, documented check-list consistent with existing taxonomy and an insight on species groups where taxonomic changes are likely in subsequent revisions. The second objective seeks to identify changes in the fauna since Van Pelt's pioneer survey of 1948, and provide a basis for similar comparisons in the future.

The county consists of 902 square miles in north-central Florida and embraces essentially all inland habitats of the northern peninsula. This rich habitat variability is reflected in its ant fauna of 110 species. Few other regions of comparable size and latitude support a larger ant diversity also documented in part for greater than 50 years. A review of the earlier work, current taxonomic authorities, and questionable or rejected records precede the new list.

EARLIER STUDIES

W. M. Wheeler (1932) was the first writer to specifically treat Alachua County ants. Sixteen years later, Van Pelt (1948) published the results of an intensive collecting effort in the region and reported 49 species as currently recognized. Van Pelt mentions two additional Alachua County records in his 1950 thesis dealing with the ants of the Welaka Reserve. The imported fire ant, *Solenopsis invicta*, was probably established in the county by the mid 1950s though the date of initial recognition in the literature is lost in the wealth of studies addressed to that species. Wojcik etc. (1975) and Buren etc. (1975) reported *Pheidole moerens* and a *Conomyrma* species currently named *insana* respectively. Subsequent studies, addressed to specific genera, have greatly expanded our knowledge. The first work was J. F. Carroll's 1975 thesis on the Florida species of *Aphaenogaster*. Unfortunately, this study remains unpublished. C. A. Thompson's 1980 thesis on *Solenopsis* (*Diplorhoptum*) species of Florida included a large amount of Alachua County material. Most of that study also remains unpublished; however, Thompson (1982) recognized a new species that is part of the fauna covered here. Trager (1984), Naves (1985), Ward (1985), and DuBois (1986) recently published taxonomic revisions of *Paratrechina*, *Pheidole*, *Pseudomyrmex*, and *Monomorium* respectively, and each study makes significant contribution to the Florida fauna.

CURRENT TAXONOMIC AUTHORITIES

The nomenclature used in this list follows the current catalog of the Formicidae (Smith, 1979) modified with the following exceptions. The treatment of specimens in the *Aphaenogaster texana* complex rests in part on data and conclusions given in Carroll's above-mentioned thesis. The 1979 catalog recognizes *Aphaenogaster*

texana carolinensis and *A. miamiana*, a form originally considered as a subspecies of *A. texana*, as occurring in Florida. The earlier names of *A. t. silvestrii* and *A. t. nana*, also cited for Florida, are deleted. Creighton (1950) suggested some taxa in *Aphaenogaster* were based on the descriptions of minimum specimens and may be invalid. Noting this variability, Carroll was unable to find satisfactory differences between specimens thought to represent both *A. miamiana* and *A. t. carolinensis*. He concluded the two forms were conspecific but did cite differences between *A. t. texana*, a western form, and *A. t. carolinensis* indicating distinct species were involved. He would thus assign all Florida material in the complex to the name *A. carolinensis*. My collecting experience and specimens I have been able to study are consistent with this view. Publication of the Carroll thesis appears unlikely and I depart from the practice of following only published studies by listing all appropriate specimens as *A. carolinensis*. I hope a revision of *Aphaenogaster* will examine this matter in justifiable depth.

The treatment of *Solenopsis* (*Diplorhoptum*) must also consider the unpublished Thompson thesis. That study found the following species in Alachua County: *Solenopsis picta*, *S. pergandei*, *S. nickersoni*, and two groups thought by Thompson to each include two to three species. One of these groups includes *S. tennesseensis* and possibly two undescribed species. All specimens I have studied appear to be conspecific and consistent with the characters of *S. tennesseensis*. The second group is related to *S. molesta*, a form described by Say in 1836. Many *Diplorhoptum* specimens over a wide geographic area have been reported under that name; however, Thompson gives good reason to believe these specimens are not conspecific. Say's type specimens are lost and his description does not give sufficient detail for clear recognition. Thompson concluded that most Florida specimens are *S. carolinensis*, a species described by Forel in 1901. Otherwise an undescribed species and possibly *S. texana* were thought to compose the Florida members of the *S. molesta* complex. I have seen a large number of specimens from many habitats representing this group and can see no evidence of more than one species. I follow Thompson in assigning the name of *S. carolinensis* to these specimens. The five species in this difficult group are distinct using this conservative treatment and the variations can await future revisions.

The list follows the recent studies cited above on *Paratrechina*, *Pheidole*, *Pseudomyrmex*, and *Monomorium* without change. Bolton (1977) has clarified *Tetramorium* taxonomy and the species earlier cited as *T. guineense* is actually *T. bicarinatum*. The 1979 catalog lists the north Florida *Odontomachus* specimens as *insularis*; however, Brown (1976) showed the correct name for these ants was *O. brunneus*. I use the name *Ochetomyrmex auropunctata* to conform with the 1979 catalog; however, reassignment of the species to *Wasmannia* is likely.

In addition, revisions in progress will affect the taxonomy of ants in this fauna and the following notes alert the reader to the groups involved. J. C. Trager is continuing the late W. F. Buren's study of the south-eastern *Conomyrma* species. The names of both *C. flavopecta* and *C. insana* will change and a previously undescribed species existing in the country will be recognized. The above names will, however, be used here along with *Conomyrma* species A, and the reader can make appropriate changes when the names are available. J. C. Trager also has unpublished data indicating *Leptogenys elongata manni* is a distinct species.

Two *Camponotus* forms, existing as distinct species with confused taxonomies, occur in the county. One form has attributes of *C. rasilis*, a name now synonymized with *C. sayi*. The other ant has *C. pavidus* attributes, but this name is now in synonymy with *C. nearcticus*, and W. M. Wheeler earlier considered *C. pavidus* as a variety of *C. rasilis*; see citations in 1979 catalog. *Camponotus nearcticus* and both of these forms coexist in Alachua County. Suitable names are as yet unavailable and I list the *rasilis*-like form and the *pavidus*-like form as *Camponotus* species A and B respectively. Finally, color races in *Crematogaster ashmeadi*, and variation in pilosity in specimens listed as *Brachymyrmex depilis* may receive taxonomic recognition.

QUESTIONABLE RECORDS

Five species taken by a single collector and not documented by existing specimens are retained in the list and a short explanation is appropriate. W. M. Wheeler (1932) reported the northern species *Ponera pennsylvanica*. The species has been recently collected south of Alachua County in Lake and Marion Counties and is known to be uncommon and spotty in occurrence near the margins of its distribution, Wheeler and Wheeler (1963). Van Pelt (1948) reported *Leptothorax bradleyi* and *Xenomyrmex floridanus*, but, unfortunately, the specimens were not found in the Van Pelt collection. In his thesis, he states that Marion R. Smith identified these species and the latter form was not uncommon on sweetgum trees. Smith was a well-recognized authority on ants and I judge his determinations worthy of recognition. Van Pelt (1958) reported *Leptothorax wheeleri*. The species is known both north and south of Alachua County and the report is accepted. The fifth undocumented species is *Aphaenogaster flemingi* reported by Carroll (1975) in xeric hardwood forest. The species is not uncommon today in similar habitats along Florida's east coast and I accept Carroll's report.

The earlier studies include remarkably few cases where misdeterminations are clearly suggested. Wheeler (1932) reported *Iridomyrmex humilis* on the basis of a single specimen. Van Pelt (1948), following M. R. Smith, concluded the identification was in error and as no further specimens have been found near the county, the same conclusion is followed here. Van Pelt (1948) reported *Crematogaster laeviuscula*, *Dolichoderus plagiatus*, and *Pheidole floridana*. The taxonomy of *Crematogaster* in 1948 was largely modified by Buren (1968). Specimens listed as *C. laeviuscula* in Van Pelt's collection, now in the Florida State Collection of Arthropods, Department of Plant Industry, Gainesville, are consistent with *C. clara* as delimited by Buren (1968). Buren notes that no records of the true *C. laeviuscula* were known east of the Mississippi River. The species is thus deleted from

the list.

Van Pelt's 1948 paper was based on a thesis of the preceding year wherein detailed collecting information was included; however, the thesis makes no mention of a *Dolichoderus* species. The specimens may have been collected just shortly before the 1948 publication but no specimens were found in his collection, and no authority was given for the determination. I conclude the record was *D. mariae* known to occur in the region. *Pheidole floridana* was also reported in Alachua County by Wojcik etc. (1975); however, Naves (1985) distinguishes the species from *P. anastasioi* noting the latter form only occurs in north Florida.

DOCUMENTATION

Two documentations are given for each species where possible. A collection housing Alachua County specimens and a published report of such material appear for most species. Additional documentation could be cited for the majority of species. The five species mentioned above having only literature reference and unreported species represented in collections complete the list. The C. Johnson and J. C. Trager collections cited many places in the list will become part of the Florida State Collection of Arthropods. The species are arranged by sub-families omitting tribe names. The sequence of genera follows Smith (1979) and species within a genus appear alphabetically. The number(s) following each species document its Alachua County distribution using sources tabulated below. The following citations and collections are number-coded for their entry into the species list.

W. M. Wheeler (1932) .. 1	J. C. Trager and C. Johnson
A. Van Pelt (1947) 2	(1985)
A. Van Pelt (1950,1958) 3	J. Watkins (per. com.) .. 12
E. O. Wilson (1955) ... 4	J. C. Trager Collection . 13
J. F. Carroll (1975) .. 5	C. Johnson Collection ... 14
C. A. Thompson (1980) . 6	Archbold Biological Station
C. A. Thompson (1982) . 7	Collection
J. C. Trager (1984) ... 8	Florida State Collection
P. S. Ward (1985) 9	of Arthropods
M. A. Naves (1985) ... 10	

SPECIES LIST

DORYLINAE (3 species)

Neivamyrmex carolinensis (Emery 1894) 14; *Neivamyrmex opacithorax* (Emery 1894) 12, 13; *Neivamyrmex texanus* Watkins 1972 12, 13.

PONERINAE (11 species)

Amblyopone pallipes (Haldeman 1844) 13, 14; *Proceratium pergandei* (Emery 1895) 16; *Proceratium silaceum* Roger 1863 13; *Discothyrea testacea* Roger 1863 14; *Cryptopone gilva* (Roger 1863) 2, 14; *Ponera pennsylvanica* Buckley 1866 1; *Hypoconera opaciceps* (Mayr 1887) 2, 14; *Hypoconera opacior* (Forel 1893) 2, 14; *Hypoconera punctatissima* (Roger 1859) 14, 15; *Leptogenys elongatus manni* Wheeler 1923 2, 14; *Odontomachus brunneus* (Patton 1894) 2, 14.

PSEUDOMYRMECINAE (5 species)

Pseudomyrmex ejectus F. Smith 1858 9,14; *Pseudomyrmex*

Leptosus Ward 1985 9, 14; *Pseudomyrmex mexicanus* Roger 1863 9, 14; *Pseudomyrmex pallidus* F. Smith 1885 9, 14; *Pseudomyrmex seminole* Ward 1985 9, 14.

MYRMICINAE (60 species)

Pogonomyrmex badius (Latreille 1802) 2, 14; *Aphaenogaster ashmeadi* (Emery 1895), 2, 14; *Aphaenogaster carolinensis* Wheeler 1915 5, 14; *Aphaenogaster flemingi* M. R. Smith 1928 5; *Aphaenogaster floridana* M. R. Smith 1941 2, 14; *Aphaenogaster fulva* Roger 1863 5, 14; *Aphaenogaster lamellidens* Mayr 1886 2, 14; *Aphaenogaster treatae* Forel 1886 5, 14; *Pheidole adrianoi* Naves 1985 10, 14; *Pheidole anastasioi* Emery 1896 2, 14; *Pheidole carrolli* Navas 1985 10, 16; *Pheidole crassicornis* Emery 1895 10, 14; *Pheidole dentata* Mayr 1886 2, 14; *Pheidole dentigula* M. R. Smith 1927 13, 14; *Pheidole metallescens* Emery 1895 2, 14; *Pheidole moerens* Wheeler 1908 13, 14; *Pheidole morrisoni* Forel 1886 2, 14; *Cardiocondyla emeryi* Forel 1881 2, 14; *Cardiocondyla nuda* (Mayr 1866) 2, 14; *Cardiocondyla wroughtoni* (Forel 1890) 13, 14; *Crematogaster ashmeadi* Mayr 1886 2, 14; *Crematogaster atkinsoni* Wheeler 1919 14; *Crematogaster clara* Mayr 1870 13, 14; *Crematogaster lineolata* (Say 1836) 2, 14; *Crematogaster minutissima* Mayr 1870 2, 14; *Crematogaster vermiculata* Emery 1895 14; *Monomorium trageri* DuBois 1986 13, 14; *Monomorium viridium* Brown 1943 13, 14; *Monomorium pharaonis* (Linnaeus 1758) 2, 13; *Xenomyrmex floridanus* Emery 1895 2; *Solenopsis carolinensis* Forel 1901 6, 14; *Solenopsis invicta* Buren 1972 13, 14; *Solenopsis geminata* (Fabricius 1804) 2, 14; *Solenopsis globularia littoralis* Creighton 1930 2, 14; *Solenopsis nickersoni* Thompson 1982 7, 14; *Solenopsis pergandei* Forel 1901 6, 14; *Solenopsis picta* Emery 1895 6, 14; *Solenopsis tennesseensis* M. R. Smith 1942 6, 14; *Leptothorax bradleyi* Wheeler 1913 2; *Leptothorax pergandei* Emery 1895 2, 14; *Leptothorax texanus davisii* Wheeler 1905 13, 14; *Leptothorax wheeleri* Smith 1929 3; *Myrmecina americana* Emery 1895 3, 14; *Tetramorium bicarinatum* (Nylander 1846) 2, 13; *Tetramorium simillimum* (F. Smith 1891) 2, 13; *Ochetomyrmex auropunctata* (Roger 1863) 14; *Strumigenys eggerti* Emery 1890 14; *Strumigenys louisianae* Roger 1863 2, 14; *Strumigenys silvestrii* Emery 1905 14; *Smithistruma bunki* Brown 1950 14; *Smithistruma carolinensis* Brown 1964 14; *Smithistruma clypeata* (Roger 1863) 13, 14; *Smithistruma dietrichi* (M. R. Smith 1931) 14; *Smithistruma ohioensis* (Kennedy and Schrumm 1933) 14; *Smithistruma ornata* (Mayr 1887) 13, 14; *Smithistruma talpa* (Weber 1934) 13, 14; *Trichoscapa membranifera* (Emery 1869) 13, 14; *Eurhopalothrix floridana* Brown and Kempf 1960 13, 14; *Cyphomyrmex rimosus* (Spinola 1853) 13, 14; *Trachymyrmex septentrionalis* (McCook 1880) 2, 14.

DOLICHODERINAE (6 species)

Dolichoderus mariae Forel 1884 13, 14; *Iridomyrmex pruinosus* (Roger 1863) 2, 14; *Conomyrma flavopecta* (M. R. Smith 1944) 13, 14; *Conomyrma insana* (Buckley 1866) 13, 14; *Conomyrma* species A 13, 14; *Tapinoma sessile* (Say 1836) 2, 14.

FORMICINAE (25 species)

Brachymyrmex depilis Emery 1893 2, 14; *Camponotus abdominalis floridanus* (Buckley 1866) 2, 14; *Camponotus castaneus* (Latreille 1802) 2, 14; *Camponotus impressus* (Roger 1863) 2, 14; *Camponotus nearcticus* Emery 1893

2, 13; *Camponotus pennsylvanicus* (DeGeer 1773) 14; *Camponotus socius* Roger 1863 2, 14; *Camponotus* species A 13; *Camponotus* species B 13, 14; *Lasius alienus* (Foerster 1850) 4, 14; *Lasius neoniger* Emery 1893 13, 14; *Paratrechina arenivaga* (Wheeler 1905) 8, 14; *Paratrechina bourbonica* (Forel 1886) 8, 13; *Paratrechina concinna* Trager 1984 8, 13; *Paratrechina faisonensis* (Forel 1922) 8, 14; *Paratrechina longicornis* (Latreille 1802) 8, 13; *Paratrechina parvula* (Mayr 1870) 8, 14; *Paratrechina phantasma* Trager 1984 8, 13; *Paratrechina vividula* (Nylander 1846) 8, 14; *Paratrechina wojciki* Trager 1984 8, 14; *Prenolepis imparis* (Say 1836) 2, 14; *Formica archboldi* M. R. Smith 1944 13, 14; *Formica pallidefulva* Latreille 1802 2, 14; *Formica schaufussii dolosa* Wheeler 1904 2, 13; *Polyergus lucidus longicornis* M. R. Smith 1947 11, 14.

DISCUSSION

The species diversity will doubtlessly increase somewhat with future work; however, the main patterns in the faunal composition are now recognizable. Both temperate and subtropical groups coexist in the region and a few of these species have very likely colonized the area since 1948. Sixty-one species or 55.45 per cent of the 110 species were not present in Van Pelt's 1948 list. A large part of these new records compose the small, litter-dwelling species and Van Pelt did not operate litter extractions to obtain this part of the fauna.

From the litter species, *Strumigenys silvestrii* is here reported for the first time in Florida and only the second time in the continental United States. *Strumigenys eggerti* and *Eurhopalothrix floridana* were previously known only from the more tropical southern third of the peninsula. The two above *Strumigenys* species are probably recent colonizers as they are associated with habitats where exotic plants have been established in recent years. *Eurhopalothrix floridana* lives in a variety of natural habitats and may have occupied the area for many years. All seven species of *Smithistruma* are missing from Van Pelt's list though they were most likely here in 1948 as well as other litter ants such as *Discothyrea testacea* and the smaller *Solenopsis* species.

Very little evidence points to a loss of species previously occupying the region. The records of *Ponera pennsylvanica* and *Leptothorax bradleyi* have been mentioned above. The erratic distribution of the *Ponera* species near its range limit suggests it was never abundant here and is likely still extant in some localized sites. *Leptothorax bradleyi* is a rare species in all collections and its preferred habitat unknown. The single record of *Aphaenogaster flemingi* in Alachua County given in Carroll's thesis and its absence in Van Pelt (1948) points also to a species never common in this fauna. The case of *Xenomyrmex floridanus* is the strongest likelihood of a true loss to the fauna. Very cold winter freezes have occurred in the area since 1948 and this tropical arboreal species may well have lost its northern colonies. *Paratrechina phantasma* has only been collected once in the county. This area is the northernmost locality for that species and its continued presence is uncertain.

While Van Pelt passed over the smaller litter fauna, it is unlikely that he missed larger species occupying habitats he regularly investigated. For instance, I judge that *Cyphomyrmex rimosus*, *Ochetomyrmex auropuncta-*

ta, *Pseudomyrmex mexicanus*, and *Pheidole moerens* would have been taken by Van Pelt's collecting methods. Their absence from his list is a strong case for their recent colonization. *Formica archboldi*, also missing in Van Pelt's work, is likewise puzzling as the species is present today in several sites throughout the country. *Solenopsis invicta* reached the area also after 1948 and the above observations show no evidence exists for the imported fire ant having evicted any species of our native ant fauna. In fact, the fauna more likely increased in this period. Of course, relative abundance and habitat usage may have changed.

Another feature of the fauna worthy of note is the series of congeneric species groups. Nine species of both *Pheidole* and *Paratrechina*, 8 species of *Solenopsis*, including all subgenera, 7 species of *Aphaenogaster* and *Smithistruma*, and 6 species each of *Camponotus* and *Crematogaster* exist within the fauna. This assemblage offers excellent opportunity for ecological studies on coexisting, congeneric ants.

Finally, the author regrets the uncertainty in species recognition associated with *Diplorhoptum* and cases where species must be named A or B. I hope revisions will remove these problems in the near future.

ACKNOWLEDGEMENTS

Dr. James C. Trager, University of Florida, and Dr. Mark Deyrup, Archbold Biological Station, have both given helpful comments on the development of this list. J. C. Trager has also kindly shared his literature on ant taxonomy. Dr. J. C. Nickerson, Florida Division of Plant Industry, has been exceptionally helpful in providing facilities for studying the Van Pelt Collection. The Alachua County Chamber of Commerce provided the county's square mile area.

LITERATURE CITED

- Bolton, B. 1977. The ant tribe Tetramoriini (Hymenoptera: Formicidae). The genus *Tetramorium* Mayr in the Oriental and Indo-Australian regions, and in Australia. Bull. British Mus. Nat. Hist. (Ent.) 36:67-151.
- Brown, Jr. W. L. 1976. Contributions towards a reclassification of the Formicidae. Part VI. Ponerinae, Tribe Ponerini. Subtribe Odontomachiti. Section A. Introduction, Subtribal Characters. Genus *Odontomachus*. Studa Ent. 19:67-171.
- Buren, W. F. 1968. A review of the species of *Crematogaster*, sensu stricto, in North America (Hymenoptera, Formicidae) Part II. Descriptions of new species. J. Georgia Ent. Soc. 3:91-121.
- Buren, W. F., J. C. Nickerson, and C. R. Thompson. 1975. Mixed nests of *Conomyrma insana* and *C. flavopecta* - Evidence of parasitism (Hymenoptera: Formicidae). Psyche 82:306-314.
- Carroll, J. F. 1975. Biology and ecology of ants of the genus *Aphaenogaster* in Florida. Ph.D. thesis. University of Florida, Gainesville.
- Creighton, W. S. 1950. The ants of North America. Bull. Mus. Comp. Zool. 104:1-585.
- DuBois, M. B. 1986. A revision of the native new world species of the ant genus *Monomorium* (minimum group) (Hymenoptera: Formicidae). Univ. Kansas Sci. Bull. 53:65-119.
- Naves, M. A. 1985. A monograph of the genus *Pheidole* in Florida (Hymenoptera: Formicidae). Insecta Mundi 1:53-90.
- Smith, D. R. 1979. Superfamily Formicoidea. In Catalog of Hymenoptera in America north of Mexico. Eds. Krombein, K. V., P. D. Hurd, Jr., D. R. Smith, and B. D. Burks. Smithsonian Institution Press, Washington, D. C., p. 1323-1467.
- Thompson, C. R. 1980. *Solenopsis (Diplorhoptum)* (Hymenoptera: Formicidae) of Florida. Ph.D. thesis. University of Florida, Gainesville.
- _____. 1982. A new *Solenopsis (Diplorhoptum)* species from Florida (Hym.: Formicidae). J. Kansas Ent. Soc. 55:485-488.
- Trager, J. C. 1984. A revision of the genus *Paratrechina* (Hymenoptera: Formicidae) of the continental United States. Sociobiology 9:51-162.
- 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 Ent. 68:261-266.
- Van Pelt, A. 1948. A preliminary key to the worker ants of Alachua County, Florida. Florida Ent. 30:57-67.
- _____. 1950. Ecology of the ants of the Welaka Reserve, Florida (Hymenoptera: Formicidae). Ph.D. thesis. University of Florida, Gainesville.
- _____. 1958. The ecology of the ants of the Welaka Reserve, Florida (Hymenoptera: Formicidae). Part II. Annotated List. Amer. Midl. Nat. 59:1-57.
- Ward, P. S. 1985. The Nearctic species of the genus *Pseudomyrmex* (Hymenoptera: Formicidae). Questiones Entomologicae 21:209-246.
- Wheeler, W. M. 1932. A list of the ants of Florida, with descriptions of new forms. J. New York Ent. Soc. 40:1-17.
- Wheeler, G. C. and J. Wheeler. 1963. The ants of North Dakota. Univ. North Dakota Press, Grand Forks. 326 pp.
- Wilson, E. O. 1955. A monographic revision of the ant genus *Lasius*. Bull. Mus. Comp. Zool. 113:1-119.
- Wojcik, D. P., W. A. Banks, and W. F. Buren. 1975. First report of *Pheidole moerens* in Florida (Hymenoptera: Formicidae). U.S.D.A. Coop. Econ. Ins. Rpt. 25(49-52):906.