A MONOGRAPH OF THE GENUS *PHEIDOLE* IN FLORIDA (HYMENOPTERA: FORMICIDAE)[1]

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INTRODUCTION

The genus *Pheidole* is one of the more important ant genera in the world. Approximately 1000 species are now known. Over 400 of these are found in the Neotropical region (Kempf, 1972), and about 75 taxa are known from North America north of Mexico. *Pheidole* spp. are abundant in many areas, and live in varying habitats ranging from the humid tropics to deserts. They are able to survive in some areas by their habits of collecting and storing seeds as food resources. They are also scavengers of dead insects and other animals, and can be predacious. Some species tends aphids and other homopterans, but this food source, so important to many ant species, is probably of relatively minor importance to most species of *Pheidole*.

Pheidole apparently is a genus of rather recent evolutionary development. No fossil *Pheidole* are known previous to the Miocene (Brown, 1973). No *Pheidole* occur in Baltic amber (lower Oligocene) although these ambers contain large numbers of specimens of other ant genera which have persisted almost unchanged since that epoch (species of *Formica, Myrmica, Iridomyrmex, Camponotus*, and others). It has been said that *Pheidole* has undergone a world wide dispersal since this time and has undergone a large proliferation of taxa as well as adaptation to many ecological nitches (Brown, 1973).

A study of the *Pheidole* of any area is one of the prerequisites to understanding the formicid interactions of that area, and this in turn could be important in the development of pest management strategies. Ants are probably the most numerous and most important animals within their size range.

One species, *Pheidole megacephala*, has become a tropicopolitan tramp species and is a serious pest in various areas (Wheeler, 1910; Flucker and Beardsley, 1970; and Lieburg, 1975). Some species sting severely and are comparable with the fire ants in aggressiveness (Buren, personal communication). Most of the species, however, appear innocuous and are usually unnoticed by man. Their importance in the ecosystem appears largely unappreciated.

Due to its size and distribution, *Pheidole* is a very difficult genus and has been a challenge to myrmecologists taxonomically as well as biologically.

Until recently only eleven species were known from Florida, which suggests that, despite its subtropical warmth, Florida was deficient in *Pheidole* when compared to Texas (36 species) and Arizona (26 species). The Florida *Pheidole* fauna has long been known to be more extensive than that of northern states such as Iowa and New Jersey (3 species each, Buren, 1944; Creighton, 1950).

With the help of keys and scanning electron micrographs it is now possible to identify, with relative ease, both the majors and the workers of the species of this genus known to occur in Florida.

REVIEW OF LITERATURE. Four of twelve species reported from Florida have that state as the type locality of the species: *P. dentata* Mayr (1886), *P. floridana* Emery (1895), *P. metallescens* Emery (1895), and *P. sitarches litorallis* Cole (1952).

Smith (1930) reported *P. morrisi*; Wheeler (1932) reported *P. anastasii*; Smith (1933) reported *P. megacephala*; Smith (1944) reported *P. dentigula*; Smith (1951) reported *P. flavens sculptior* (misidentification); Van Pelt (1956) reported *P. pilifera*; Smith (1958) reported *P. bicarinata vinelandica*, and Wojcik *et al.* (1975) reported *P. moerens*. Additional information is discussed under each species by the respective authors.

Creighton (1950) was the first to try to give an extensive key to the North America *Pheidole*; 63 species were listed, and he used morphological characters pertinent to both majors and workers. Creighton's statements about the North American *Pheidole* are as follows:

> Most of our species of *Pheidole* possess a dimorphic worker caste with major and minor workers not connected by intermediates. In a few species, however, the worker caste is polymorphic (*P. kingi, P. instabilis* and *P. torpescens, P. vasliti arizonica*, etc.). Most of the species garner seeds and it is believed that the large-headed major workers function as seed-huskers. The enlarged head of the major is mainly filled with mandibular muscles. This enables the jaws to exert much pressure, which should be useful in cracking off the husks of seeds. It may be added that sometimes the head of the major is so large in proportion to its body that if the insect is turned over on the back of its head it cannot regain a normal posture without help from other workers. Despite their preference for a graminivourous diet many species of *Pheidole* will accept other food as well. They seem less attracted to honey-dew than do many ants but will often feed voraciously on animal tissue when the opportunity offers. The majority of our species form small colonies. In many cases there are only about two or three hundred individuals in a fully developed nest. Even in the case of the species which produce comparatively large nests (*P. morrisi, P. hyatti, P. desertorum*, etc.) a colony of more than two or three thousand individuals would be exceptionally large. By far the majority of our species nest in soil. The nest may be built under a stone or in open soil without a covering object. In the latter case there is often a mound or craters

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