

**Dates on which the Immature or Mature Sexual
Phases of Ants have been Observed
(Hymen.: Formicoidea).**

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Ants, because of their striking polymorphism, offer many difficulties to the taxonomist. It is especially unfortunate that practically all the keys and descriptive matter on these insects have been based on the workers. Queen ants, it is true, can very often be placed specifically with little or no difficulty because of the strong similarity which they bear to the workers. In many cases, however, this resemblance to the workers is more or less elusive and one would not be courageous but foolhardy in attempting to determine queens specifically, unless one knew that they came from the same colony as did the workers, and that they were not temporary or permanent parasitic forms.

As an illustration of the confusion existing in connection with the proper assignment of males and females to the correct species, no group of ants offers a better example than the driver or legionary ants of the subfamily Dorylinae. In this group there are numbers of species known only from one caste, such as the worker, the queen, or the male. Until the sexual phases are taken in the colony with the workers this confusion will continue to exist. Taxonomists are gradually clearing up this perplexing problem by assigning many species to synonymy as they finally link up the various castes of a species. As a typical example one might cite the case of *Eciton (A.) pilosus*, which was described by F. Smith from worker specimens in 1858. A year later Smith erected another species, *E. (A.) mexicanum*, from a collection of male specimens only. For many years the two species stood in literature until 1921 when Wheeler detected that *E. (A.) mexicanum* was the male of *E. (A.) pilosus*. Since the latter name was published first, the name *E. (A.) mexicanum* was very properly relegated to synonymy.

The males of ants are much more difficult to place specifically than either the workers or queens. At the present time one should be very cautious in assigning males to the species unless

one is very sure that they were taken along with the workers of their species. Very probably the specific determination of male ants in the future will be based almost, if not entirely, on a study of their genitalia. Even now there are certain species of ants, for example, *Paratrechina* (*Nylanderia*) sp. the workers and queens of which cannot be specifically determined except by the presence of males, and the determination of the males is based for the greater part on the genitalia.

This paper is being published with the idea that it will make known to some extent the approximate dates of the year in which the sexed forms of many Southern ants have been found. The dates of the appearance of the sexual phases of a given species will vary greatly, depending on the season, the latitude, the altitude, the topography of the soil, and other factors. However, in spite of all these, the records here given should offer some information in regard to the approximate periods in which the sexual phases are to be found.

As one will note in examining the records, the sexual phases have been taken under a number of variable circumstances, which might best be enumerated as follows: (a) periods in which both the pupae and adult stages of the sexual phases have been found in the colony or nest, (b) periods in which the male or the female, or both are found in the colony or nest, but not the sexed pupae, (c) nuptial flights, when either sex or both are leaving the nest, and (d) isolated individuals of one sex, or both, taken singly or in numbers away (remotely) from the nest, as at lights, crawling on the ground, etc. When the ants are found under condition (a) above then there is no doubt that the colony is producing its sexual phases at this time. When the ants are found under condition (b) cited above this seems to be indicative that virgin queens, and unmated males instead of taking their nuptial flight immediately are postponing it until late in the season or until the spring or summer of the following year. Colonies of certain species if examined during the winter will often be found to contain overwintering males or queens under the condition cited under (b). Nuptial flights are generally thought of as mating flights

of the sexual phases of the current year, but perhaps the only safe criterion for establishing this point would be to follow the history of the colony or else examine the nest carefully to see if sexual pupae were present. If sexual pupae were present, one could safely say that a part, if not all, of the adult sexual forms arose from pupae produced during the current season.

A large number of these observations were made by the author. In addition observations have also been made by the following: Messrs. G. W. Haug, E. E. Byrd, J. W. Ward, H. Dietrich, J. P. Kislanko, G. L. Bond, G. C. Broome and others. To these gentlemen I wish to express my appreciation for permission to publish their records.

The Alabama records given in this list were made by Dr. A. H. Sturtevant, the single Louisiana record by Professor O. W. Rosewall. I am very much indebted to both of them for the use of their records.

The symbols used below have the following meaning: M. P. means male pupae; M. means males; Q. P. means queen pupae; and Q. means winged queens.

January 1-15: Ponera opaciceps (M., Q.) McHenry; *Crematogaster ashmeadi* (M.) State College; *Camponotus caryae* var. *decipiens* (M., Q.) State College.

January 16-31: Solenopsis xyloni (M. P.) State College; *Crematogaster opaca depilis* var. *punctulata* (M.) State College; *Dorymyrmex pyramicus* (M., Q.) State College; *Camponotus caryae discolor* var. *cnemidatus?* (Q.) State College; *caryae* subsp. *rasilis* (M.) Wiggins; *C. caryae* var. *decipiens* (M., Q.) Longview; *C. castaneus* (M., Q.) Starkville; *Prenolepis* (*Nylanderia*) species (M., Q.) State College.

February 1-15: Camponotus caryae subsp. *rasilis* (M.) State College; *C. caryae* var. *decipiens* (M., Q.) Ackerman.

February 16-29: Ponera opaciceps (M.) Perkinston; *Dorymyrmex pyramicus* (M., Q.) State College; *Camponotus caryae* subsp. *rasilis* (Q.) Moss Point; *Prenolepis* (*Nylanderia*) *vividula* var. (M., Q.) Sessums; *P. (N.)* species (M., Q.) Sessums.

March 1-15: Leptothorax curvispinosus (Q. P.) State College; *Crematogaster victima* subsp. *missouriensis* (M.) State College; *C. opaca depilis* var. *punctulata* (Q.) State College; *Camponotus caryae* subsp. *rasilis* (M., Q.) Starkville.

March 16-31: Crematogaster opaca depilis var. *punctulata*

(Q.) State College; *Pseudomyrma brunnea* (Q.) Lucedale; *Camponotus castaneus* (M., Q.) Ocean Springs; *C. castaneus* subsp. *americanus* (Q.) Quitman; *C. herculeanus* subsp. *pennsylvanicus* (M.) State College.

April 1-15: *Dorymyrmex pyramicus* (M., Q.) State College; *Camponotus castaneus* (M., Q.) Starkville; *Prenolepis* (*Nylanderia*) species (Q.) Adaton; *P. (N.) parvula* (Q.) State College.

April 16-30: *Solenopsis xyloni* (Q. P.) State College; *Monomorium minimum* (Q. P.) State College; *Crematogaster lacviuscula* var. *clara* (Q. P.) State College, Cedar Bluff; *Iridomyrmex humilis* (Q. P.) Ackerman, (M. P., Q. P.) Columbus; *Tapinoma sessile* (M. P.) Cedar Bluff, Starkville, (Q. P.) Longview, Cedar Bluff, (M., Q.) Longview; *Dorymyrmex pyramicus* (Q.) State College; *Camponotus caryae rasilis* var. *pavidus* (M.) Cedar Bluff; *Lasius (A.) interjectus* (Q.) Chalhybeate, Starkville.

May 1-15: *Leptothorax curvispinosus* (Q.) State College, (M., Q.) Kushla, Alabama; *Solenopsis xyloni* (M., Q.) State College, (M.) Kushla, Alabama; *Aphaenogaster lamellidens* var. *nigripes* (Q.) State College; *Monomorium minimum* (M.) Longview; *Crematogaster victima* subsp. *missouriensis* (M., Q.) Kushla, Alabama; *Iridomyrmex humilis* (M., Q.) Louisville, Columbus; *I. pruinosus* var. *analis* (M., Q.) Starkville, (M. P., Q. P.) Louisville; *Tapinoma sessile* (M., Q.) Longview; *Dorymyrmex pyramicus* (M., Q.) Kushla, Alabama; *Dolichoderus taschenbergi* var. *atterima* (Q.) Kushla, Alabama; *Lasius (A.) interjectus* (Q.) Booneville; *Prenolepis* (*Nylanderia*) species (Q.) Columbus.

May 16-31: *Ponera trigona* var. *opacior* (M., Q. P., Q.) Aberdeen; *Leptothorax (D.) pergandei* (M. P., M. Q. P.) Mayhew; *Solenopsis xyloni* (M., Q.) State College (Q.) Starkville; *S. picta* var. *moerens* (M.) Kushla, Alabama; *Aphaenogaster treatae* (Q. P.) Adaton; *Monomorium minimum* (M.) Starkville; *Crematogaster lacviuscula* (M.) Cedar Bluff; *C. victima* subsp. *missouriensis* (Q. P.) Cedar Bluff, State College, Mayhew; *C. lineolata* (Q. P.) Aberdeen; *Pheidole pilifera* (Q. P., Q.) Cedar Bluff; *Ph. dentata* (Q.) Cedar Bluff; (Q. P., Q.) State College, Columbus, (M. P., M., Q. P., Q.) Mayhew, (Q. P.) Louisville; *Ph. vinelandica* (M. P., Q. P.) Cedar Bluff, (M. P., M., Q. P., Q.) State College; *Pseudomyrma pallida* (M. P., Q.) Kushla, Alabama; *Iridomyrmex humilis* (Q.) Meridian; *I. pruinosus* var. *analis* (M. P., M., Q. P. Q.) State College, (M., Q.) Eupora; *Dorymyrmex pyramicus* (M. P., M., Q. P.) State College; *Camponotus caryae* (Q.) State

College; *C. castaneus* (M., Q.) Adaton, Kushla, Alabama; *C. (C.) mississippiensis* (M. P., M., Q. P.) Cedar Bluff; *Lasius (A.) interjectus* (M., Q.) State College; *Prenolepis (Nyländeria)* species (Q. P., Q.) State College, (Q.) Columbus.

June 1-15: *Ponera trigona* var. *opacior* (M., Q.) Sibley; *Leptothorax curvispinosus* (Q.) Ripley; *Solenopsis xyloni* (M. P., Q. P., M., Q.) Columbus, Wiggins (Q.) Columbus (M., Q.); *Aphaenogaster lamellidens* var. *nigripes* (M.) Starkville; *A. fulva* subsp. *aquia* (Q.) Ripley; *Crematogaster laeviuscula* (M., Q.) Ripley; *C. victima* subsp. *missouriensis* (M., Q.) Columbus; *Pheidole dentata* (M. P., Q. P., M., Q.) Starkville; *Iridomyrmex humilis* (M.) Columbus; *I. pruinosus* var. *analís* (M., Q.) Columbus, Ripley; *Prenolepis (Nyländeria)* species (M.) Starkville.

(To be continued.)