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Polygyny

Polygyny in a Colony of the Fire Ant *Solenopsis geminata*^{1,2}

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Although the queens of some ant species have long been known to unite to found colonies (pleometrosis), only a few species have been observed to have multiple queens in a single well-established colony (polygyny). Brian (1965) and Sudd (1967) reviewed the works of several authors that reported finding multiple queens in well-established colonies of certain *Lasius* species. Gray (1971) reported finding multiple queens in colonies of *Myrmecia dispar* (Clark) and *M. desertum* Wheeler. Wilson (1971) reviewed some of the same reports mentioned by Brian and Sudd and cited other instances of the finding of multiple queens in a single colony. He stated that large colonies of *Camponotus herculeanus* (Latrielle) and *C. ligniperda* (Latrielle) often contain several queens. He further stated that J. C. Moser and M. S. Blum respectively, in personal communications had reported the occasional finding of 2 queens in colonies of *Atta texana* Buckley and "*Solenopsis saevissima*." The latter species is very closely related to *S. geminata* (F.), belonging to the same genus. Also Markin et al. (1972) found as many as 50 of the queens of the red imported fire ant, *Solenopsis invicta* Buren, clustered together under stones, cans, or other debris following nuptial flights and from 2 to 5 queens in common brood chambers with egg masses and small larvae. However, by the time the 1st workers appeared, only a single queen remained and in well-established colonies no more than one fertile queen was ever found.

In our work with the imported fire ant, we have observed a similar sequence of events. We have never found more than one fertile queen in any of the several hundred mature colonies of this ant that we have excavated and examined during the past 10 years though as many as 105 dealate females have been found in a single mound. Also, Travis (1941), in his studies of the fire ant, *S. geminata*, in north Florida and south Georgia, never found more than one functional queen in a colony. He did find that after he removed the mother queen from each of 12 mounds, the number of workers dwindled for a period of ca. 3 months and then 7 of the 12 mounds began production of new brood. These nests continued active for over 3 years and no sexual forms, either alate or dealate were ever located.

We have found that laboratory colonies of the imported fire ant that have no queen will adopt a new queen. Whether this occurred with the colonies of *S. geminata* described by Travis (1941) or whether the colonies contained more than one fertile queen initially is unknown. However, in March 1971 in north central Florida (Union County) while opening the nests of field colonies of *S. geminata* and *S. invicta* for study, we noted 2 highly physogastric dealate females in a single well-established nest of *S. geminata*. The 2 ♀ and ca. 50 worker ants from the nest were taken and returned to the Insects Affecting Man Laboratory at Gainesville, Fla., for study.

Each female was placed with ca. 25 workers in a separate plexiglass ant nest (Wilson 1962³) which was then maintained in a plexiglass tray, 50 cm wide × 117 cm long × 10 cm deep. Laboratory-reared German cockroaches, *Blattella germanica* (L.), and the artificial ant diet described by Bhatkar and Whitcomb (1970) were used for food; temperature was maintained at 27±1°C.

Egg production began in each nest within 72 hr after establishment, small larvae were apparent by 10 days, pupae by 18 days, and the 1st workers by 27 days. Both colonies continued to grow and after 90 days, each was composed of several thousand workers. The queen died in one colony after 114 days so the remaining workers were placed with the other colony and were accepted with little animosity.

The results indicate that both the dealate females were fertile, and that mature colonies of *S. geminata* may contain more than one functional queen.

³ No description of the ant nest was given, but it was illustrated in Plate XII of Wilson (1962).

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¹ Hymenoptera: Formicidae.

² Received for publication July 14, 1972.