Insectes Sociaux, Paris
1984, Volume 31, n° 1, pp. 87-102

THE REPRODUCTIVE CYCLE OF THE QUEENLESS ANT PRISTO *MYRMEX PUNGENS*

Tomio ITOW, Kazuhiro KOBAYASHI, Masao KUBOTA (1), Kazuo OGATA (2), Hirotami T. IMAI (3) and Ross H. CROZIER (4)

Department of Biology, Faculty of Education, Shizuoka University, Shizuoka, 422, Japan
(1) Nakasone 13, Odawara, Kanagawa-ken, 250, Japan
(2) Faculty of Agriculture, Kyushu University, Fukuoka, 812, Japan
(3) National Institute of Genetics, Mishima, Shizuoka-ken, 411, Japan
(4) School of Zoology, University of New South Wales, P.O. Box 1, Kensington, N.S.W. 2033, Australia

Reçu le 17 octobre 1983. Accepté le 20 décembre 1983.

SUMMARY

The life cycle of the myrmicine ant *Pristomyrmex pungens* was investigated. Colonies of this species are usually composed of several thousand small workers, although a few males (2-3 %) occasionally appear during June and July in mature colonies, and large workers with ocelli and abortive spermathecae (here termed *ergatoid queens*) were observed extremely rarely. We found that the virgin small workers can lay eggs and that these develop into further small workers. Cerebral ganglion cells and oogonial cells had the diploid chromosome number (2 n = 24), but the haploid number (n = 12) was observed in oocytes at pachytene, and also in spermatocytes from the rare males. Males have functionally normal copulatory organs and their spermatogenesis is normal, but they probably do not mate, because small workers have no spermatheca and their copulatory organs are degenerative. These observations indicate that reproduction in *P. pungens* is carried out predominantly or, probably, wholly by the small workers and hence is thelytokous. We discuss the evolution of the *P. pungens* life cycle, pointing out the difficulty of applying the "queen" concept to this species or even in deciding whether or not it is "eusocial". In view of the apparent genetic isolation between colonies, the mode of selection maintaining sociality in this case is probably interdemic group selection rather than kin selection.

RESUME

Cycle reproductif d'une colonie sans reine de Pristomyrmex pungens

Nous avons étudié le cycle biologique de la fourmi myrmicine *Pristomyrmex pungens*. En général, les colonies de cette espèce se composent de plusieurs milliers de petites