NOTE ON EXTRAORDINARY LONGEVITY IN A QUEEN OF THE FORMICINE ANT GENUS *CAMPONOTUS*

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It has long been known that fertilized females of several genera of “higher” ants can attain ages under laboratory (and presumably under natural) conditions of an order not approached by any other Hymenoptera—and equalling or exceeding most other insects or even spiders. The records of these exceptionally long-lived cases have recently been tabulated by Hölldobler and Wilson (1990, pp. 169–170) and involve a considerable number of primarily formicine and myrmicine genera. This paper reports an exceptionally long-lived queen of the Australian ant *Camponotus perthiana*. What makes this case of special interest is that, at 23.2 years, it is the second longest individual record, exceeded only by a queen of *Lasius niger* recorded by Appel (Kutter and Stumper 1969). In addition, this record encompasses the entire life-span of the queen from before first egg-laying until death. Thus it was possible to observe its development, reactions in the colony, and general behavior, at intervals ranging from daily to weekly, throughout the period of over twenty-three years.

Camponotus perthiana is a dominant, earth-dwelling, partially nocturnal forager that is common and conspicuous through much of southeastern Australia. It typically forms large populous mound colonies. The subject queen was found isolated in a clean, initial chamber (no brood yet present), under a large stone in a sparse grove of a species of *Casuarina* near the town of Sutherland, New South Wales, on January 12, 1968. It was about twenty feet removed from a populous mound-colony of the same species—presumably its parent nest.

The insect was brought to the U.S. suitably bottled, and then introduced to a modified earth-containing Lubbock glass nest, where egg-laying proceeded normally and a first brood reared without incident. The colony expanded rapidly thereafter and was

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moved to its final situation in a large plastic arena with screened top, in a stack of Lubbock nests, added as required. Relative humidity was maintained between 35–50% (this is a semi-xerophytic form), and diet consisted of sugar water and chopped insects, supplied on average at four to five day intervals throughout the life of the colony. By estimate, five to seven thousand daughter workers were reared during the life of the colony. No young females were produced, and only a single male was found, produced about midway in the life of the colony.

The queen continued to produce worker broods almost until death. The species is normally polymorphic, and the greatest concentration of major workers appeared early in colony life and at its approximate midpoint. All the final broods developed as minors.

As expected, the queen received conspicuous worker attendance through the first three sets, approximately, of workers maturing. Thereafter, as worker population increased, it became much less obvious, and the queen moved about, often nearly independently, from nest to nest. From the twenty-second year onward, the queen's activity was greatly reduced. In her final months the female hardly moved unless stimulated, though she did continue to produce a much reduced number of eggs, which (as typical throughout), were removed from the vicinity of the queen for worker rearing. In her last months, there was virtually no special attention paid to the female by the worker personnel. At death, the body was triturated and deposited on one of several existing kitchen middens, where it could not be retrieved.

DISCUSSION

This essentially unique formicid capacity for achieving long life is both puzzling and intriguing. It seems to have been a capacity achieved relatively early in the evolution of the family. Thus the authors have maintained females of two monogynous species of *Myrmecia* (*gulosa* and *vindex*) in the laboratory for twelve and ten years respectively (and these were individuals taken with colonies already well established).

The selective advantage of this property in genera that normally maintain monogynous colonies seems more or less evident. But what about polygynous species—*Monomorium pharaonis*, for example, *Pheidole megacephala*, or even the polygynous species

of *Formica*? Here selective pressure toward queen longevity might seem to be considerably reduced, and there is evidence in some cases of reduced queen life span (e.g., Peacock and Baxter, 1950). Hard data, however, are difficult to come by for most species. Thus this subject may represent an interesting evolutionary challenge for future investigators.

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