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ABSTRACT

Investigations to determine the factors initiating foraging in *Atta cephalotes*(L.) and *Acromyrmex octospinosus* (Reich.) were carried out between 1969 and 1972.

Before any detailed investigations could proceed the exact nature of the foraging rhythm had first to be established since published reports were conflicting and obscure in parts. The foraging rhythm, whether diurnal or nocturnal, was found to be of a virtual 24-hour periodicity. However, the amount of time spent foraging per diel, and consequently the amount of foraging, was greater in the night than in the day.

Overriding the basic diel cycle was what has been loosely defined as a long-term rhythm where foraging was maintained in either a nocturnal or diurnal phase over periods of varying length. A trail could switch from diurnal to nocturnal foraging or vice-versa quite suddenly and maintain all the while the basic diel cycle.

Observations had indicated that foraging was not necessarily synchronised between different trails even of the same colony. A more detailed investigation was undertaken since clarification would provide some clue to the underlying causes of rhythmic activity. Results suggested that the physical environment was not principally responsible, if at all, for foraging initiation. This was supported by a more detailed investigation into the role of general and micro-environmental physical factors measured at the experimental nest site. It appeared, however, that nest entrance temperature and light intensity were of more importance than other factors in initiating foraging.

Preliminary investigations of a possible endogenous control were also undertaken where enforced changes in the size of the fungus-garden were compared with daily foraging. While there was a significant increase in the amount of foraging with decreasing garden size, this was due to a greater intensity of foraging by the colony rather than any shift in the timing of the rhythm.

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G. V. Pollard
Department of Biological Sciences
University of the West Indies
St. Augustine