

XVIth INTERNATIONAL ETHOLOGICAL CONFERENCE

THE UNIVERSITY OF BRITISH COLUMBIA

VANCOUVER, AUGUST 18-27, 1979.



ABSTRACTS

EARLY INFLUENCE AND DIVISION OF LABOUR IN THE ANT LASIUS NIGER.

A. LENOIR, Laboratoire de Psychophysiology, Faculté des Sciences, 37200 TOURS, France.

The division of labour was studied in young foundation colonies, raised in laboratory from swarming females. Numbered discs stuck on the abdomen allowed individual recognition. The abundant data obtained during observations of food exchange behaviour and brood-nursing were treated by correspondance analysis. The following factors were examined.

Influence of larval stages

Larval stages are highly attractive to the ants. Lack of contact with larvae at the onset of imaginal life has strong but not irreversible consequences :

Nursing behaviour depends on the presence of larval stages. Ants that have never been in contact with larvae will gradually adopt those that they are presented with and will feed and tend them normally after a few days. This is therefore a rapid adaptation to the nursing condition.

Development of foraging behaviour can be more strongly inhibited by lack of experience. In the absence of larval stimulation only a few workers become foragers and assume the needs of the colony. A few hours of contact with larvae is enough to reestablish normal transport behaviour towards the nest in the foragers, that is to say, learning virtually occurs in the course of a single trial. Stimulation of foragers is related to the total biomass of the colony rather than to the quantity of larval stages alone.

Deprivation of contact with larvae has no effect on the post-winter behaviour. Pre-winter experience seems to be "effaced" and the workers are physiologically ready for foraging and intensive rearing of larval stages. The situation is probably similar under natural conditions in which the quantity of larval stages diminishes in the autumn : the young workers having no, or little experience of larval care at the onset of hibernation.

The development of feeding behaviour therefore includes a phase of early experience that influences the behaviour of the adult. There is no sensitive period for this experience, and the behaviour can be expressed according to the needs of the colony.

Social deprivation

Complete social deprivation from emergence results in disturbance of the capacity for social integration, whether in the presence of normal congeners or other isolates. After five days isolation, workers are aggressive and group formation becomes very difficult. Momentary social deprivation of the adult does not have any serious consequences, the most specialised foragers resume their activity, other foragers may change in this respect, but social integration per se is normal.

In conclusion polyethism in ant colonies is not only related to age and caste (or size) of workers, but has also diverse causes including individual early experience which were not well understood up to now.