Labeyrie, V., Fabres, G., Lachaise, D. (eds) Insects – Plants 383
© 1987 Dr W. Junk Publishers, Dordrecht. ISBN 90-6193-642-X. Printed in the Netherlands.

FORAGING BEHAVIOUR OF ANTS MESSOR STRUCTOR IN RELATION WITH THE CHARACTERISTICS OF THE SEEDS (HYMENOPTERA, FORMICIDAE)

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One large colony of **Messor structor** was studied in Touraine. Seed distributors (round boxes, 8 cm diam.) each with a photoelectric cell were placed on the foraging arena of the colony. Cells were connected to a graph-recorder which allows automatic recording of the passages of ants entering or leaving the distributors. These were filled with a constant number of seeds every week or day and the number of seeds retrieved could thus be counted.

Exp. 1: Influence of the seed species

It is known that **Messor** are fond of Graminaceae seeds but they can retrieve almost all seed species. Melon-seeds were offered in some distributors and rye-grass in others every week during 9 weeks. During the first period of 3 weeks 72% of the rye-grass and 48% of the melon seeds were collected and later almost all the seeds (99%). It confirms that ants do prefer some seed species, but after a period of habituation they retrieve all the available seeds, and the distributors are rapidly emptied.

Exp. 2: Influence of the seed size

3 sizes of rye-grass (3, 5 and 7 mm) were offered daily to the ants for 18 days. The harvest increased regularly from 26 to 97% for the largest seeds. These large seeds are slightly preferred to middle-size seeds but the difference is not significant. Small seeds were less transported (6 to 51%). When very large food sources are available the workers prefer the larger items, which could be interpreted as an optimization of the harvest.

Exp. 3: Influence of the quality of the seeds

Empty seeds were offered in some distributors, they were not transported where normal seeds were all collected. When the choice was between ripe and unripe seeds, there was only a slight preference for ripe seeds but it is not significant (88 vs. 79%). This can be explained by the fact that ants also eat unripe seeds when they are the only available ones in the beginning of the season.

Exp. 4: Selectivity on heterogeneous food sources

Full and empty seeds were proposed simultaneously in the same distributors. In this situation, 25% of the empty seeds were transported, which indicates a decrease of the selectivity (number of edible items retrieved/total number of items retrieved). The selectivity was correlated to the number of passages/day. This means that when the traffic increases ants retrieve more useless items, perhaps due to a phenomenon of facilitation.

Messor ants adopt a foraging group strategy which permits the complete and rapid exploitation of food sources, they are opportunistic. It is an adaptation to arid climates where a lot of seeds are available only during limited periods of the year. This could explain why harvesting ants could be a danger for homogeneous plantations of Graminaceae. For example, in the Mediterranean region when a lawn is sowed, it is necessary to destroy the **Messor** with a pesticide at the same time, otherwise all grass seeds are retrieved in the nests.