42. ANT-SEED INTERACTIONS IN THE NORTHERN JARRAH FOREST

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Seed taking by ants in Australia is of widespread occurrence. An exceptionally large number of Australian plant genera possess seeds with additional structures (elaiosomes) which render them attractive to ants. Such seeds are often collected by ants for their elaiosomes in which case the seed itself may not be damaged.

Seed-taking ants may be categorised as elaiosome collectors, general collectors which consume the seed contents, and species which incorporate seeds into the structure of their nest. Six ant genera are known to take seeds in the northern jarrah forest. This paper describes the role of three important seed takers in this region: Melophorus sp. 1 (A.N.I.C.) (elaiosome collector), Rhytidoponera inornata (elaiosome and general collector) and Rhytidoponera violacea (general collector).

Nest structure has been investigated by lead casting, nest distribution and density by mapping nests in a series of plots, and seasonal foraging pattern by a monthly pitfall trapping programme. Seed distribution in nests and in adjacent soil has been obtained by sieving layers of soil from various depths.

The mean nest depths for M.sp.1, R. inornata and R. violacea were 12.2, 23.8 and 21.6 centimetres respectively. The soil sievings revealed over 110,000 seeds per hectare in nests of each of the first two species; few intact seeds were found in R. violacea nests. The vertical profile of seeds in M.sp.1 and R. inornata nests closely reflected the variation in nest volume with depth.

R. inornata foraged throughout the year; M.sp.1 was only active during the hotter months. It is suggested that the more omnivorous R. inornata is able to forage throughout the year by switching to other food sources when seeds become scarce while M.sp.1 is more closely bound by the period of seed availability.

The viability of seeds taken from M.sp.1 and R. inornata nests was not appreciably reduced despite the fact that most elaiosomes had been removed.

The effects of fire were simulated in autumn by heating nests of all three species to 100° C at a depth of 2 centimetres for 30 minutes. Adjacent soil plots were also treated in a similar way and additional control nests were left unheated. Many more Acacia pulchella, Bossiaea ornata, Mirbelia dilatata, and Eucalyptus marginata seedlings germinated on heated and unheated R. inornata nests than on unnested areas. Heating of nests encouraged increased germination of only the first mentioned species. There was no correlation between R. violacea nests and seedling distribution. The data for M.sp.1 suggest that this species also has an important influence on the distribution of seedlings.