

Table 1 Numbers of worker and alate ants in five *R. violacea* and five *R. inornata* nests measured at Karragullen and five *M. turneri perthensis* nests measured at Perth

	<i>Rhytidoponera violacea</i>						<i>Rhytidoponera inornata</i>						<i>Melophorus turneri perthensis</i>					
	1	2	3	4	5	Mean	1	2	3	4	5	Mean	1	2	3	4	5	Mean
Workers	46	359	176	150	135	173.2	37	194	403	290	64	197.6	257	241	256	247	151	230.4
Alate males	8	0	101	295	75	95.8	147	1	27	6	46	45.4	0	0	0	0	0	0
Alate females	0	0	0	0	0	0	0	57	0	91	0	29.6	0	0	0	0	0	0

All nests were collected during the peak summer foraging period

Table 2 Quantities of food items carried to *R. violacea* ($n = 5$) and *M. turneri perthensis* ($n = 10$) nests at Karragullen

	Mar	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Mar	Apr	%
<i>R. violacea</i>												
Seeds	3	2	0	0	0	0	0	0	0	0	0	6.3
Plant fragments	1	0	0	0	1	0	0	0	0	0	0	2.5
Invertebrates	7	13	3	7	6	6	6	6	3	8	8	91.2
<i>M. turneri perthensis</i>												
Seeds	4	n.f.	n.f.	n.f.	n.f.	n.f.	n.f.	3	9	2	5	29.1
Plant fragments	2	n.f.	n.f.	n.f.	n.f.	n.f.	n.f.	8	2	3	5	25.3
Invertebrates	11	n.f.	n.f.	n.f.	n.f.	n.f.	n.f.	4	5	8	8	45.6

Measurements made in most months between March 1978 and April 1979 for 30-min periods per nest

n.f. not foraging

from a 3 cm boundary outside of the rectangle, presumably because the lateral conduction of heat provided conditions that were optimal for these plant species (Fig. 8). For both ant species, the number of seedlings emerging was much higher around ant nests, it being almost non-existent elsewhere (Supplemental Table S5). Furthermore, the number of seedlings emerging was much higher around the heated nests than the unheated counterparts. *M. turneri perthensis* demonstrated a significant species \times treatment interaction, with *Trymalium ledifolium* emerging in higher densities from heated nests than other treatments ($F_{3,112} = 3.9$, $P = 0.011$). *Acacia pulchella* was not affected by treatments. A similar pattern was evident in *R. inornata* nests ($F_{3,72} = 2.3$, $P = 0.082$).

Discussion

The findings presented here, along with those from an earlier paper which examined the fate of seeds taken by these three ant species (Majer, 1982), indicate a close association between the biology of these ant species and their potential to disperse angiosperm seeds. All three species are distributed throughout the Southwest Botanical Province of Western Australia, albeit with *R. inornata* being more confined to the extreme south of this region. They are thus well situated to disperse seeds of many families found

within this exceptionally biodiverse (Hopper and Gioia, 2004) region. It should be stressed that there are other species from both ant genera which are involved in myrmecochorous relationships, and members of other ant genera as well.

All three species exhibit a diurnal and seasonal activity that coincides with periods of seed production, which ranges from around 1–4 months after the main September–October flowering period (Majer, 1980a), with seeds tending to fall during daytime, when hot conditions cause certain fruits to desiccate and shed seeds (B. Lamont, pers. comm.). Nevertheless, as flowering of myrmecochore and non-myrmecochore plant species were closely correlated, it does not appear that phenologies have evolved to take advantage of, for instance, the increased activity level of ants in the spring–summer months. It therefore appears that ant activity levels fortuitously correlate with seed production (i.e., a lag of approximately 3–4 months after flowering). By contrast, Guitián and Garrido (2006), working in Spain, have found that myrmecochores flower approximately 4 weeks before non-myrmecochores, possibly as an adaptation to produce seed at a time of maximal ant activity.

On the whole, *Rhytidoponera* activity is less seasonal and coincides less with seed-fall than does *Melophorus* activity. Inspection of the food carrying data for *R. violacea* and *M. turneri perthensis*, and also the midden analysis of all three species, indicates that *Melophorus* appears to be more