Rhytidoponera (*inornata* especially) activity peaked during the early afternoon, again in the warmest part of the day.

Response to fire

Rhytidoponera violacea and *R. inornata* demonstrated no clear response to fire. *R. violacea* maintained activity after the burns (Fig. 5a, $F_{1,12} = 0.399$, $P = 0.54$). *R. inornata* may have declined in activity after the burns, but so did activity in the unburnt plot (Fig. 5b, $F_{1,12} = 0.117$, $P = 0.738$). The effect of burning on *Rhytidoponera* spp. activity was therefore inconsequential.

In the control plots there were as many *M. turneri perthensis* individuals active after the burns as there were before the burns (Fig. 5c). In the burnt plots, however, activity decreased, with 1.7 times as many individuals active before the burns as compared to after the burn. This direction of change was only apparent in three of four sites (in the fourth site, activity increased by >100% after the burn) and there was not a significant treatment × time effect ($F_{1,12} = 0.518$, $P = 0.485$). Therefore, although fire may decrease *Melophorus* activity, this pattern is not uniform.

Nesting preference

We located 27 nests each of *R. inornata* and *M. turneri perthensis*, representing nest densities of 675/ha for each species. We were unable to locate sufficient nests of *R. violacea* to examine densities or nest–habitat relationships, although unpublished observations elsewhere suggest that similar nest densities to *R. inornata* can be achieved. *R. inornata* did not demonstrate a significant nest site preference (ground cover, $\chi^2 = 0.73$; top cover, $\chi^2 = 3.67$; Supplemental Table S2). In contrast, *M. turneri perthensis* had a significant nest site preference for sites with a low ground cover ($\chi^2 = 10.13$, $P < 0.01$) and low overstorey shade ($\chi^2 = 7.35$, $P < 0.05$, Supplemental Table S2).

Nest structure and depth

Rhytidoponera violacea nests were, on average, 22.2 cm deep (Supplemental Table S3) and were often associated with buried woody material. Structurally, nests tended to comprise a broad vertical channel, which often spiralled around a live or dead woody taproot (Fig. 6a). *R. inornata* nests were of a similar depth (mean = 25.2 cm) but the channels of the nest were much finer than those of the other *Rhytidoponera* spp., and led off into smaller side branches (Fig. 6b). *M. turneri perthensis* nests were of a rather different structure, comprising a vertical channel with a series of side galleries at reasonably regular intervals (Fig. 6c). Seeds were frequently observed embedded in the lead from these galleries. *M. turneri perthensis* nests from the laterite were significantly more shallow (mean = 12.7 cm) than nests in the sandy soil at Yalgorup (mean = 21.7 cm) ($F_{3,34} = 5.37$, $P = 0.004$) (Supplemental Table S3).

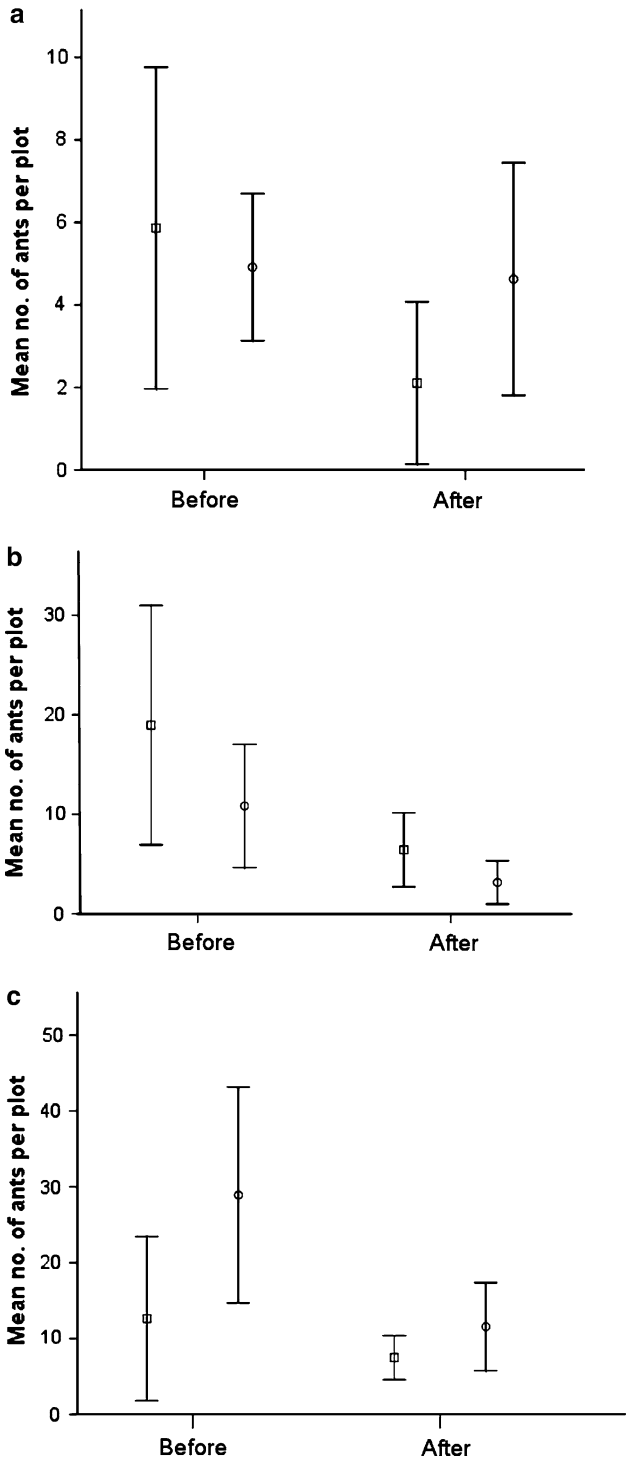

Fig. 5 Effects of burning on activity of **a** *R. violacea*, **b** *R. inornata* and **c** *M. turneri perthensis* in four sites. *Empty square* control plots, *empty circle* burnt plots. *Error bars* represent 1 standard error; vertical axes scales differ in the three graphs