

Tunnel geometry of the subterranean termite *reticulitermes grassei* (isoptera : rhinotermitidae) in response to sand bulk density and the presence of food

Abstract

The cryptic habits of subterranean termites restricts detailed analysis of their foraging patterns in situ, but the process is evidently dominated by tunnel constructions connecting the nest with woody resources discovered within the territory of each colony. In this study, tunnel formation and orientation were studied experimentally in the termite *Reticulitermes grassei* (Clément), using 2-dimensional laboratory foraging arenas containing fine sand as the substratum. The building of exploratory tunnels over a 10-day period and the geometry of the resulting network are described. Fractal analysis showed that tunnel geometry had a fractal dimension, regardless of the total length tunneled whether foragers encountered the food source or not. The bulk density of the sand in the arenas affected the distances tunnelled, with higher density reducing construction, but did not affect tunnel geometry. Tunnels were not discernibly orientated with respect to the positioning of the food source, even in a situation where termites had failed to find the food source at a distance of less than 50 mm, suggesting that volatiles from wood are not attractants. © Institute of Zoology, Chinese Academy of Sciences.