



Ecology of Termites

ECOLOGY OF TWO ARBOREAL-NESTING TERMITES IN NEW GUINEA COCONUT PLANTATIONS

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We studied the factors affecting the distribution and abundance of arboreal-nesting termites in coconut plantations. In these homogeneous biotopes, the dynamics of colonization, the effect of the environment and the interactions between colonies can be easily observed. The two most abundant species in this habitat are *Microcerotermes biroi* (present on 80% of the trees supporting termite nests or covered runways) and *Nasutitermes princeps* (14%). *M. biroi* is usually monogynous (79% of the colonies) and reproduces through massive swarming flights. Colonies may be polydomous and colonize 1-5 trees; sometimes, several callies are built on the same tree. *M. biroi* appears to be a pioneer species: this species was first to invade a young, 10-year old coconut plantation; within 3 years, 40% of the trees had been colonized. By contrast, *N. princeps* is often polygynous (60% of the colonies), which suggests that reproduction by budding is common in this species. Colonies are often polydomous and colonize up to 20 trees covering a large territory, of up to 1000 m². An exceptionally large, presumably unicolonial system featuring 134 nests on 3.1 ha was discovered. The plantation structure affects the colonization by arboreal termites: in clear plantations of tall trees (<100 trees/ha, ~25m high), 25% of the trees are colonized by termites, whereas this proportion doubles in denser habitats (120-300 trees/ha, trees >13m high). Furthermore, nest volume tends to increase with habitat density. Predation by ants is limited: arboreal *Crematogaster spp.* interfere only locally. Interspecific competition is conspicuous: *N. princeps* outcompetes *M. biroi* and invades its nests. Intraspecific competition has milder consequences, since when trails of agonistic colonies meet, they tend to diverge afterwards. In conclusion, the two species use different strategies: *M. biroi* invests in alate production to colonize the habitat rapidly by numerous small colonies, whereas *N. princeps* develops large colonies which can produce buds and rely on offensive mechanisms to expand its territory in an environment already largely occupied by *M. biroi*. Habitat structure and interspecific competition seem the two most important factors affecting the arboreal-nesting termites in coconut plantations.