

Termite assemblages, forest disturbance and greenhouse gas fluxes in Sabah, East Malaysia

Abstract

A synthesis is presented of sampling work conducted under a UK government-funded Darwin Initiative grant undertaken predominantly within the Danum Valley Conservation Area (DVCA), Sabah, East Malaysia. The project concerned the assemblage structure, gas physiology and landscape gas fluxes of termites in pristine and two ages of secondary, dipterocarp forest. The DVCA termite fauna is typical of the Sunda region, dominated by *Termes*-group soil-feeders and *Nasutitermitinae*. Selective logging appears to have relatively little effect on termite assemblages, although soil-feeding termites may be moderately affected by this level of disturbance. Species composition changes, but to a small extent when considered against the background level of compositional differences within the Sunda region. Physiologically the assemblage is very like others that have been studied, although there are some species that do not fit on the expected body size-metabolic rate curve. As elsewhere, soil-feeders and soil-wood interface-feeders tend to produce more methane. As with the termite assemblage characteristics, gross gas and energy fluxes do not differ significantly between logged and unlogged sites. Although gross methane fluxes are high, all the soils at DVCA were methane sinks, suggesting that methane oxidation by methanotrophic bacteria was a more important process than methane production by gut archaea. This implies that methane production by termites in South-East Asia is not contributing significantly to the observed increase in levels of methane production worldwide. Biomass density species richness, clade complement and energy flow were much lower at DVCA than at a directly comparable site in southern Cameroon. This is probably due to the different biogeographical histories of the areas.