

Population dynamics of termites with special reference to *Odontotermes obesus* (Desneux)

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ABSTRACT

Odontotermes obesus is a widely distributed mound building termite in Kerala. Mound density varied from 8-10 mounds /ha. The total population was directly proportional to the size of the mound and weight of the fungus garden. Mound of *o.obesus* varying in height from 2-50cm and 20-116 cm in circumference at the base ,contained a population ranging from 71-1828 individuals. The population showed seasonal fluctuation. Mature alates were recored during March, April, September and October. The proportion of workers inside the mound (25.1% to 42.8%) was low during August-November. This is attributed to increased foraging during the rainy season. High percentage of larvae were found during August, October and March (9.9% to 24.4%) indicating peak egg production during the monsoon season.

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Termites are one of our planet's most diverse and abundant animal groups. There are 2600 termite species (Kambhampati and Eggleton, 2000). Termites are social insects that are primarily wood-feeders, but also feed on a variety of other organic substrates, such as living trees, leaf litter, soil, lichens and animal faeces. They occur throughout the tropics and sub tropics, as well as in many temperate areas of the world. In natural ecosystems, they perform a beneficial role in nutrient cycles by accelerating decomposition. The Oriental Zoogeographical Region has a rich termite fauna, comprising 1059 species as reported by Ahmad and Akhtar (2002). In Kerala though there is a rich termite fauna, absolutely no study on the population of any species has been carried out so far.

MATERIALS AND METHODS

The study was carried out in 1500 ha of land in Mayanad, Kollam district, Kerala, for a period of one year ie from June 2009 to May 2010. To determine the density of the mounds in the study site, ten plots of one ha each were selected at random and the mounds were directly counted from each plot. To determine the population density, ten mounds varying in height and basal circumference were selected. Each one was quickly

broken open and five samples of fungus garden (100g each) from different parts of the mound at random were taken carefully and quickly before the termites could respond to the disturbance. Each sample was kept in a separate tray and the various castes such as workers, soldiers, pre-soldiers and larvae were separated by hand sorting. Individuals of each caste were counted from all the five samples and the mean value was determined. The entire fungus garden from the mound was collected and air-dried the same day of collection to prevent degradation. When the combs were dry and hard, they were broken up and cleaned with a dry paint brush to dislodge dead termites and soil particles. These were oven dried at 50°C and weighed. The total population was calculated on the basis of the total weight of the fungus garden.

To study the seasonal fluctuation in the population, mature mounds of *O.obesus* were chosen (maturity was determined solely on the production of a large brood of alates the previous year). Six mounds varying from 22-27 cm in height were selected. Population estimation per 100 g of fungus garden was made at monthly intervals for one year. By the principle of least squares, the relationship between the height /circumference of the mound (X) and total population (Y) can be established by the curve of the form $Y = AB^X$ where A and B are population parameters estimated from the sample. Regression analysis to ascertain the relationship between the weight of the fungus garden and the height/circumference of the mounds was carried out using the statistical package 'Statistix 4.1'.

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