

## Observations on the fungus *Termitomyces* sp. - growing in the termite nests of tea gardens of Silchar

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Termites are one of the most abundant terrestrial animals on earth. Sub-terranean or mould-building termite species cultivate a unique fungus, *Termitomyces* sp. within the nest, called "fungus garden", which helps in the breakdown of plant material. This fungus grows only in termite nests. Microscopic observations of the termite nests showed that the fungus were like white spongy beads, growing in clumped fashion. The spongy beads bear moistures over their surface, which might be contributing in maintaining cool temperature in the termitaria as required by the termite population within them.

**Key words:** Fungus garden, termites, *Termitomyces*

Termites, known as white ants, are a group of eusocial insects usually classified at the taxonomic rank of order Isoptera. (Harris, 1970) Termites are much closer to cockroaches and mantids, and all the three are sometimes clumped into a super order called Dictyoptera. Some scientists have concluded that termites should be classified as a family Termitidae within the cockroaches' under order Blattodea (BBC, 2007). Termites are generally grouped according to their feeding behaviour. Thus the commonly used general groupings are: subterranean, soil-feeding, drywood, dampwood and grass eating. Termites are major detritivores, particularly in the subtropical and tropical regions, and their recycling of wood and other plant matter is of considerable ecological importance. Some species of termite practice fungiculture- they maintain a 'garden' of specialized fungi of the genus *Termitomyces*, which are nourished by the excrement of the insects (Roonwal, 1979).

Termite nests of the termite *Odontotermes feae* were collected from the tea growing areas of tea gardens of Silchar by excavating their mounds (Fig. A, B). Termite nests were then taken to the laboratory and observed under microscope to study any growth of the fungus *Termitomyces* sp.

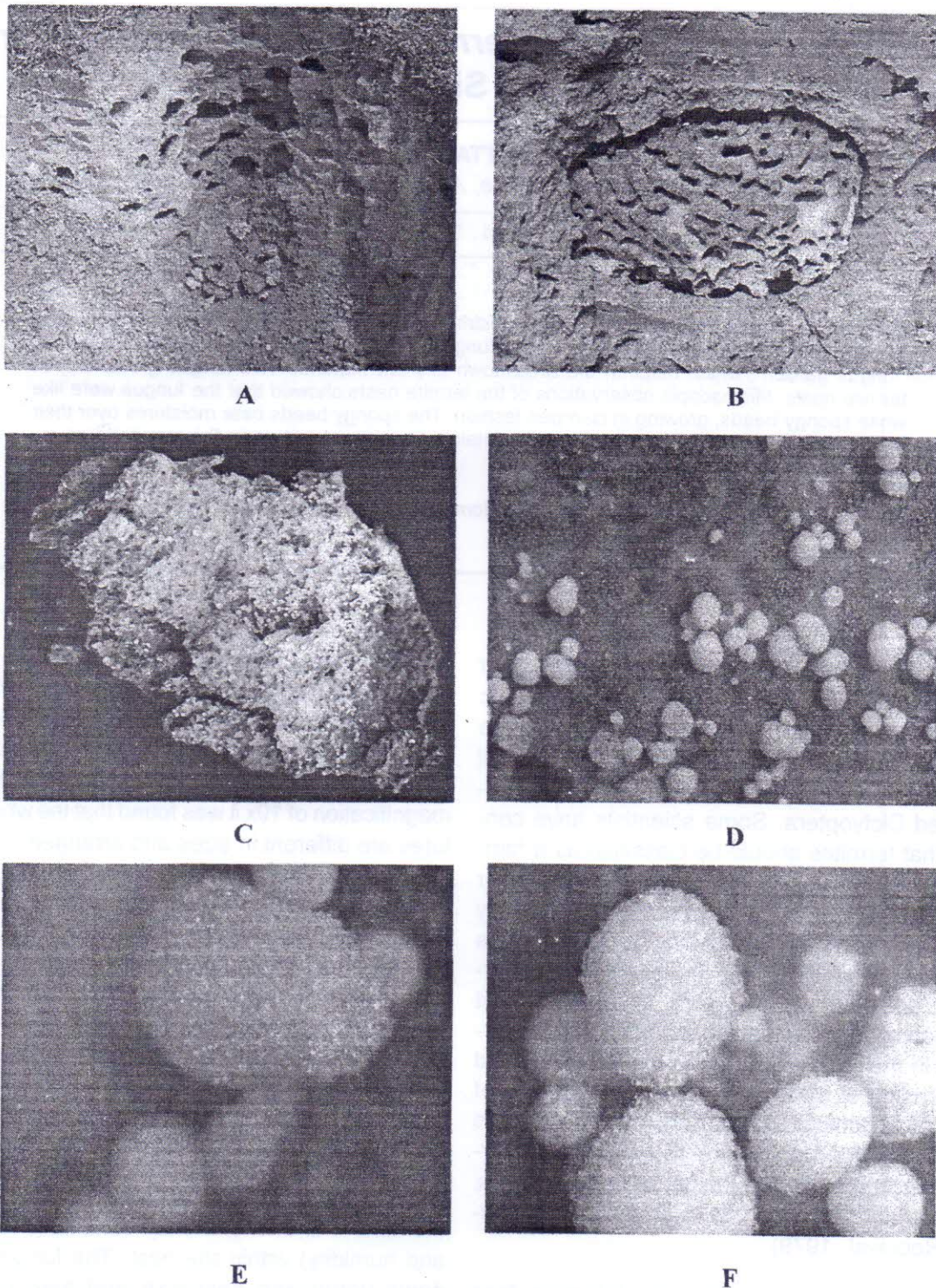
The termites have been found to grow special structures the "fungus combs" in their nests. They are grown mainly on soil, decomposed plant parts and

termite excreta. They support the growth of various fungi belonging to the genus *Termitomyces* sp. The fungus was found to grow like white beads over the inner surface of the termite nests (Fig. 1. C). When observed under microscope at the lower magnification of 10x it was found that the white structures are different in sizes and arranged in clumps. Under higher magnification of 40x the white beadlike structures were looking like sponges bearing moisture over their surface (Fig. 1. D, E, F). The moisture seems to be mainly from the respiratory activities of the termite individuals or from soil, which helps to keep the temperature low and to maintain the humidity high inside the nests to keep them cool.

Sands (1969) reported that the function of the fungus *Termitomyces* sp. grown by termites appears to be partly nutritional and partly concerned with the control of environmental conditions (i.e. temp. and humidity) within the nest. The fungus breaks down lignin and cellulose and also produces spores, which are ingested by the termites. Thomas (1981) has shown that *Termitomyces* sp. degrades nitrogen-poor substrates and consequently provides termite with a relatively nitrogen rich food. According to Abo-Khatwa (1977) the fungi provide termites with vitamins and nitrogen.

The fungi are found to survive only in the termite nests. Till date these fungal species could be grown





**Fig. 1.** A : Distribution of termite nests inside the exposed mound. B : A large sized termite nest/termitaria in the exposed termite mound. C : Growth of *Termitomyces* sp. on the termitaria. D : Clumped growth of *Termitomyces* sp. on the termitaria (X10). E-F : Fungal body of *Termitomyces* sp. with moisture retained by them (X40).

in artificial medium but the growth is very slow, and very little literature is available on the same (Roonwal, 1979). The reason for the fungus not to grow in artificial media seems to be the ambient condition inside the termite nests.

The temperature inside the termite nests is quite low and the humidity is very high for the growth of fungus. The above information may help to study the biology and control of the termite genus under the laboratory and field conditions.



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