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Termites - An Economic Polyphagous Pest

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Among the social insects, termites are of paramount importance as pests. There are 300 species of termites in India and out of these, 40 species are of economic importance. Two species i.e. *Microtermes obesi* (Holm.) and *Odontotermes obesus* (Rambur) account for almost 80 per cent of total losses in South Asia. Termites can be managed by IPM approaches like growing resistant varieties, mulching, mechanical approach as killing of queen by digging of termiteria and other eco-friendly methods such as biological control and use of botanical pesticides. In severe conditions, chemicals like chlorpyriphos can be used to control the pest.

Introduction

Termites are most primitive social insects in the Animal kingdom and their colony consists of workers, soldiers, reproductive queen and king. Termites are also known as "White ants". Termites live either underground in soil, in wood or construct lofty attractive earthen mounds or carton nests by making colony. Termites are important pests of agricultural crops in tropical and sub-tropical regions of the world. Termites damaged plants wilt, dry up and can be easily pulled up. Termites damage the crops right from sowing the crops till harvest. Termites are principally cellulose feeder. About 300 termite species have been recorded from India. Of which, 40 species have been found injurious to economical plants. They belong to three important genera; *Angulitermes*, *Microtermes* and *Odontotermes*, but two species i.e. *Microtermes obesi* (Holm) and *Odontotermes obesus* (Rambur) account for almost 80 per cent of total losses in south Asia.


Angulitermes


Microtermes


Odontotermes

Termites Ecology and Behavior

Ecological and behavioral knowledge related to any pest is necessary for their efficient and economical control. In regard to habitats, termites are of two types viz., the wood-dwellers and the

ground dwellers. Wood dwellers confined throughout life to wood (dead or living) in which they make tunnels and also nest. Whereas ground dwellers live either exclusively or partly in ground soil. Ground connection is being necessary for their normal life and breeding.

Communication: Termite lives in dark, so sensory and chemical communications are very important. Termites communicate primarily by secreting chemicals called pheromones. Each colony develops its own characteristic odour. Sound is another means of communication. In some species, soldiers and workers may bang their heads against the tunnels. The resulting vibrations are perceived by others in the colony and serve to mobilize the colony to defend itself. Communication is a resultant effect of a stimulus triggered by a sense organ present in/on the termite body

Feeding behaviour: Tropholaxis is the process of exchanging the secretion or liquid food between individuals of termite. Wood eating termites hold the wood fibers between their mandibles and tear pieces (extremely small fragments of wood, a piece at a time) by moving their head to the side. Termites cultivate the fungus in fungus garden. In the nest, globular or ovoid cavities are found, which usually are walnut to a coconut in size and occupying these cavities are strange looking nodules of a friable but hard consistency.

Defence behavior: The soldiers mainly carry out the defence of colony against intruders. Mechanical defence by mandibles, head shape and chemical secretion were found in soldiers of many termites.

Nest building: Termites construct wide range of nests. Nest building initially evolved from a defence reaction. Nest can be inside the wood, building, subterranean, above ground as a mound and arboreal.

Foraging behavior: The most efficient foragers are able to build over non-woody materials to forage over a long distance. *Odontotermes* spp. and *Macrotermes* spp. can forage long haul at least 50 meters (Roonwal 1979).

Damage Caused

Losses caused by termites to agriculture and other commercial crops are believed to be very extensive. A large variety of economic plants including agricultural crops, plantation crops, fruit trees, garden trees, etc. are recorded to be attacked by termites. Plants are generally attacked by termites when they are not in a vigorous state of growth and when their vitality is low either due to internal growth factors or environmental causes such as drought or poor soil.

Termite infestation

Termites also causes damage to lumber, wood panels, flooring, sheetrock, wallpaper, plastics, paper products and fabric made of plant fibers. Their most serious damage is in the loss of building structural strength. Other costly losses include attacks on flooring, carpeting, art work, books, clothing, furniture and valuable papers.

Management

Monitoring of termite population: In order to monitor termite infestation, two techniques are generally utilized i.e. endoscopy & computer tomography (CT, an elaborated x-ray technique to visualize the gallery system within the wood) and by directly observing the termites. Termites can also be detected by installing plastic monitoring stations around the perimeter of the building or agriculture land.

Cultural control: The termites can be controlled by use of certain resistant varieties and cultural practices. The wheat varieties like Raj-1174 and Raj-1752 give resistant against termites during early and late sown crop. In sugarcane, varieties like CO.767, CO.1148, COJ.64 and COJ.79 can tolerate the termite damage to some extent. In mango orchard, monthly irrigation with hoeing can give better control of *Odontotermes obesus* (Rambur).

In addition, mulching with the neem cake and *Ipomea argentea* (Meisn) provide effective control in checking the infestation of termites in groundnut crop.

Mechanical control: Termite foraging activity can be reduced by artificial breaking up of the soil through ploughing and other methods.

Biological control: Arthropod predators of termites e.g. scorpions, frog, snakes, cricket, spiders, dragonflies, wasps and beetles. Some birds are also found to feed on alates swarmers, which consume about 10 to 30 per cent of swarmers. In addition to predators, fer entomopathogenic fungi like *Beauveria bassiana* (Baptala) @ 10^7 conidia/ ml can effectively control the termites.

Botanical control: Herbal extract (Hexane) of *Ageratum conyzoides* (L.) gives effective control, causing 70.6 per cent mortality of *Microcerotermes beesoni* (Coghlan 2004).

Chemical control: Seed treatment is an effective tool for the control of termites. Different scientists have reported various insecticides as seed treatment against termites. Monocrotophos (17.0 ml/kg seed) was found most effective seed treatment in chickpea crop. In addition, chlorpyriphos @ 1.25 kg a.i./ha was most effective treatment against termites in sugarcane crop. Several bait systems are also available for termite control and some are effective, if properly utilized. The chemical present in baiting system is usually slow-acting and takes a little bit longer to control the termite colony. The bait products contain the following active ingredients: diflubenzuron, hexaflumuron, sulfluramid and noviflumuron. Some of these baits are available only through commercial pest control professionals. Over-the-counter bait products may not provide satisfactory termite control (Akutse *et al.* 2012)

Conclusion

Termites are social insect and economically important polyphagous pests of field crops and household. In order to control them, proper monitoring of termite infestation is required and on the basis of their severity, the management strategies can be planned and executed.

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