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Termites: Its relation with Humans and their Management

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SUMMARY

Termites are the Eusocial insects which belong to the order Isoptera. They are considered as white ants. They are sometimes called as silent destroyers because they live and thrive in the home and yards without causing any visible damage. They are detritivorous i.e., they feed on dead plants and trees, as well as dead components of living trees, such as wood and soil wood. Termites are regarded widely as the world's most devastating insect pests. Each year, these pests causes extensive damage to buildings and structures, resulting in significant financial losses. There are 220 different species of termites in India which cause problems to the properties. Termites relates with the humans in many ways such as pest, as food, in Agriculture, in Science and Technology. Several management practices and technologies have been developed for getting rid of the termites attack.

INTRODUCTION

Termites belong to the order Isoptera or epifamily Termitoidae. They are Eusocial insects. Termites are sometimes considered as "white ants" and are widespread insect nuisance belonging to the order Isoptera. They are widespread and prolific throughout the world's tropical and sub-tropical climates. Currently, 3,106 species have been identified, with a few hundred more to be discovered. They live in a big sized groups, primarily underground nests and they construct a little clay mounds that are visible above the ground for passage. They are well known for their depredations. They are also known as silent destroyer because they live and thrive in the home or yards without causing any visible damage. Termites mainly feed on cellulose based plant components. The mouth of the termite is capable of breaking woody material into small pieces, this capacity which causes significant property damage in human residences. Termites can gnaw on the foundations of houses, furniture, shelves, and even books. They are detritivorous i.e., they feed on dead plants and trees, as well as dead components of living trees, such as wood and soil wood. Termites also harm the field crops, ornamental plants, cash crops, and forest trees. As nature's scavengers, they transform stables, limbs, and plant debris to humus. Termites account for 10% of animal biomass in the tropics and subtropics of the world, and this proportion jumps to 95% when just soil insects are considered. Termite natural activities improve soil pH, organic carbon content, water content, and porosity for aeration. The termite colony or society, is a well organized and well-connected unit. There is a caste system in place, with labour division depending on the structure, function and behaviour of colony members. The reproductive, soldier, and worker castes are the most important in the colony. Soldiers and employees are either male or female and are sterile.

Different species of termites:

Termites are regarded widely as the world's most devastating insect pests. Each year, these pests causes extensive damage to buildings and structures, resulting in significant financial losses. There are 220 different species of termites in India which cause problems to the properties. The species are *Coptotermes gestroi*, *Coptotermes heimi*, *Heterotermes indicola Schedorhinotermes* spp., *Odontotermes* spp., *Psammotermes rajathanicus, Macrotermes gilvus, Microcerotermes* spp., *Nasutitermes* spp.

Relationship with humans:

As Pests:

Termite species causes severe damage to unprotected buildings and other wooden structures due to their wood feeding behaviour. Termites play an important role as decomposers of vegetative material and wood and where structures and land scapes with structural wood components, cellulose derived structural materials and ornamental vegetation.

As Food:

Humans consume 43 number of termite species. The proteins by the termites can enhance the human diet where malnutrition is frequent. It acts as an alternate source of protein. Termites are consumed in many parts of the world, but this practice has recently gained popularity in the affluent countries. It is served and consumed in different styles in different parts of the world. Alates are a major component of diet in many parts. Collecting or cultivating insects is done in a variety of ways by different groups, with soldiers from various species being collected at times. Queens are considered a delicacy, despite their difficulty in obtaining them. Termite alates are nutrient-dense, with appropriate fat and protein levels. They have a nut-like flavour after cooking and are regarded as tasty.

In Agriculture:

Termites sometimes considered as serious agricultural pests, where crop losses can be significant (3-100 percent). Water infiltration has substantially improved thanks to termite tunnels in the soil, which allows precipitation to soak in deeper, reducing runoff and thereby
soil erosion through bioturbation (Mitchell, 2002). Termite infestations can cause significant damage to cultivated plants such as eucalyptus, upland rice, and sugarcane, including attacks on leaves, roots, and woody tissue. Cassava, coffee, cotton, fruit trees, maize, peanuts, soybeans, and vegetables are all susceptible to termites

In Science and Technology:

The gut of the termite has sparked a slew of research projects aiming at replacing fossil fuels with more environmentally friendly, renewable energy sources. Termites are considered as a powerful bioreactors which can produce two litres of hydrogen from a single sheet of paper. Within the hindgut of termite, around 200 species of microorganisms thrive inside and helps in releasing hydrogen that has been trapped inside the wood and plants that they eat. The work of the unidentified enzymes in the gut of the termite breaks down the lingo-cellulose polymers into sugars, which are then converted to hydrogen. The complex mounds that termites make have spurred the creation of autonomous robots capable of constructing elaborate structures without human aid. Termites utilise advanced technology to regulate the temperature of their mounds.

Management of Termite:

Get rid of moisture: Moisture is one of the major factors that attract termites into the home. Termites attack can be kept far away by removing excess moisture from the home. A dehumidifier might aid, if it is a humid area.

Fix leaks: Regular check is to be done for any leaks or signs of degradation in the home or yards. Termites love termite-infested roofs and moisture-soaked walls. Repair and seal leaks as soon as possible, and inspect your home or yard on a regular basis, especially in basements and dark places. These areas are frequently disregarded, yet they are the first to attract pests. A leak in the basement is particularly appealing because it is closer to the ground, making it easier for termites to attack.

Maintain a distance between soil and wood: Make sure that the soil and the wood are maintained with proper distance. Most experts agree that a spacing of at least eighteen inches is necessary. To establish a physical barrier for termites, use stones or cement to divide soil from the wooden area, especially in patios, gardens, and other areas.

Use borate on wood before priming or painting: Borate is a widely used termite repellent. Prior to priming and painting, spraying of borate on the wood should be done. It absorbs into the wood, preventing termites from biting and gnawing on it. After the termite spray has cured, prime and paint it as usual, then use it to build window frames, doors, and furniture. This borate spray is long-lasting enough to keep termites far away.

Place infected items in the sun: If termites are causing damage to a piece of furniture, expose it to direct sunshine for at least three days. Summer is a good time to use this termite protection approach because termites can't endure

the heat. By leaving infected furniture in the sun, the heat will kill the termites and dry out the furniture, reducing the risk of re-infestation. Before putting the furniture back into the house, it's a good idea to dust it completely and treat it with a termite repellent.

Management of termite in field crops

- Un-decomposed Cow manure should be avoided.
- Stagnation of water should be avoided during flood irrigation.
- Cleaning, collection and burning of plant residues should be done regularly.
- Using phenyl 1 percent in irrigation water to deter termites from the farm bed.
- Pentachlorophenol is used as a termite repellant.
- Termite control along with the fungus Metarhizium anisopliae (trade name: Bio Blast).
- Use of methyl bromide and chloropicrin as fumigators for the control of termites.
- Prior to sowing the seed treatment with chlorpyriphos 20EC @ 400ml in 5 litres of water per quintal of seeds should be done, and the seeds should be dried in shade.
- During field irrigation, Chlorpyriphos 20 EC @ 2-3 litres should be utilised.
- Seed treatment with Imidacloprid @ 70 percent WS (Gaucho) and 48 percent FS.

Different technology used for termite control:

Barrier technology:

Physical barrier: In this technique fine particle of sand and crushed volcanic cinders, were found to have the ability to act as a barrier against the subterranean termite *Reticulitermes hesperus*. To operate as an effective barrier, Logan and his co-worker determined that the particle size should be between 1.7 and 2.4 mm.

Chemical barriers: This technique can be divided into two categories: repellant and non-repellant. Non-repellent chemicals used against termites include Cloranthraniliprole, Imidacloprid, Chlorfenapyr and Fipronil. Chlorpyriphos, Bifenthrin, Permenthrin and other repellent chemicals. Whereas, Pentachlorophenol is used as a termite repellant

Bait technology: Baiting is a promising technology of termite management in building construction. Baiting technique is almost proved against lower termites including *Reticulitermes* and *Coptotermes* (Cullinet and Grace, 2000). Bait toxicants were divided bait toxicants into three groups viz.

- The metabolic inhibitors.
- Biological control agents.
- Insect growth regulators (IGRs).

Borate technology: Borate refers to the compound which contains boron and oxygen; usually it exists naturally in the form of sodium and calcium borate. Indian has recommended use of borate compounds for wood preservation in the form of BCCA (Borate CCA) and ACZB (Ammonical Copper Zinc, Borate).

CONCLUSION

Termites as it causes extensive and severe damage to the Agricultural crops and buildings in the tropics it is necessary to take all the precautions. Proper tracing of the infestation followed by correct identification of the target termites species combined with correct selection of treatment method will lead to successful management in cost effective and environment friendly way. Extension and promotional activities will lead to prevention of termite attack.

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