



Destructive Insects of Library and Their Control

* Dr. T. V. Sathe

Professor, Department of Zoology, Shivaji University, Kolhapur, 4164, India
* Corresponding Author

A. G. Khamkar

Department of Zoology, Shivaji University, Kolhapur, 4164, India

ABSTRACT

Libraries are very important source of information in the form of books, reviews, monographs, diaries, journals and periodicals. In recent years personal libraries became characteristics of advanced life style. Therefore, protection of libraries is essential part of the day. In the present study, both institutional and personal libraries were taken into account.

In all, 18 insect species belonging to the termites, silver fishes and book lice have been reported throughout the year. All species damaged books in the libraries. These pests were controlled by spraying and dusting libraries with .03% and 5% malathion respectively or by fumigating with SO₂ or heating libraries at 50-60°C at 3-6 hr.

KEYWORDS : Destructive insects, library, control

INTRODUCTION

Libraries are very important source of information in the form of books, monographs, reviews, diaries, journal, periodicals and encyclopedias. Now-a-days personal libraries are becoming integral part of modern life. However, the libraries and the books are destroyed by several insects. Therefore, protection of libraries both institutional and personal is integral part of pest management. Keeping in view all above facts, the present work was carried out from Kolhapur, India. In past, Pruthi (1958), Arora & Glotra (1960), Atwal (1976), Kolekar & Sathe (2003) and Sathe & Chougale (2008) worked on library insects.

MATERIAL & METHODS

For diversity studies insects have been collected from various selected libraries both institutional and personal from Kolhapur, India. The collected samples were examined and identified by consulting appropriate literature cited in the text. Observations were made on insect occurrence, damage caused to library, books and morphological features by spot observations by one man one hour search method at evening 7.00 p.m. to 8.00 p.m. and morning 7.00 a.m. to 8.00 a.m. Morphological features of the species have been recorded with the help of compound microscope and measured with oculometer. Spraying, dusting and fumigation with pesticides was made to libraries at morning and evening hr. The present work was conducted at 2 institutional and 10 personal libraries of Kolhapur.

RESULTS

Results are recorded in table-1 and figs. 1 to 3 indicate that 18 species of insects were associated with library and books both in institutional and personal. Five termite species were found damaging library building and books. Similarly, five species of silverfishes were associated with books in the library and caused moderate to severe damage. As regards to book louse four species were found damaging books. All 18 species recorded in table-1 were found in the library throughout the year but damage intensity to the books was increased in monsoon period than others. Termites have been controlled by drilling 0.05% chloropyriphos in the basement and around infested area. Spraying library with 0.03% malathion or and dusting 5% malathion or fumigating SO₂ or heating libraries at 50°C - 60°C for 3-6 hr controlled termites, silver fishes and booklice effectively.

DISCUSSION

India is considered to be one of the richest centres of biodiversity in the world, particularly because of the large number of diverse ecosystems which nurture an extremely large number of animals and plant species (Ananthkrishnan, 1993). Biodiversity may lead positive or negative effects on the growth of the region. Therefore, constant survey and resurvey of biodiversity is the need of the day. Libraries are persistent and nonfluctuating ecosystems containing specific type of insect diversity leading to damage to books and building itself. In the present study, 18 insects have been reported from libraries. Out of which 5 species of termites were found damaging library building. However, all 18 species were associated with books in the library and

caused damage to books. Termites make numerous galleries to the books from ground level. Therefore, basement of building should not have cracks and crevices for termite entry. According to Atwal (1976) *Heterotermes* spp. damaged the building in many countries. *Odontotermes obesus* was most common and found causing damage to several agricultural crops (Atwal, 1976). *Nasutitermes* although, small sized were highly destructive to timbers in houses in Philippines (Atwal, 1976). In the present study, *Nasutitermes* was found damaging library building, wooden racks and books.

Recently, Sathe & Chougale (2008) studied biodiversity of termites from Western Ghats as destructive pests of forest trees. They reported 32 species from Western Ghats of Maharashtra. Termites were controlled by treating infested building areas by drilling with *choropyriphos*. Silver fishes *L. saccharina* and *T. domestica* occurred all over the world as an important pests of library books, and associated with hot and moist part of the houses and libraries at the basement (Atwal, 1976). Kolekar & Sathe (2003) studied the diversity of silverfishes from Kolhapur. They reported 6 species belonging to the genera *Lepisma* and *Termobia*. All 6 species reported by Kolekar & Sathe (2003) were associated with books in the libraries in Kolhapur. Silver fishes were found throughout the year but reached its peak of population in warm climate. Full grown insects were found in about 8 months. However, overlapping generations were common throughout the year in the present study.

According to Atwal (1976) *L. transvaalensis* occurred in India as library pest. In the present study, four species of the genus *Liposcelis* have been reported from the libraries causing damage to library books. All species found throughout the year, particularly, in hot and moist climate their population peaked in Kolhapur region. Libraries are unique, permanent, and very effective source of information. Therefore, libraries should be protected from insect pests by spraying or dusting pesticides like malathion and chloropyriphos, fumigating SO₂ and heating libraries at 50-60°C.

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Table 1 : Insect pests of library from Kolhapur

Sr. No.	Insect and family	Nature of damage	Feature & life cycle	Control measures
1.	<i>Heterotermes indicola</i> (Wasmann) (Isoptera : Rhinotermitidae)	Books, wood work, Building	Subterranean, breeds in the ground, found throughout year	Spray 0.03% malathion / chloropyrifos / chlor-dane, Fumigation with SO ₂ , heating library to 50-60°C
2.	<i>Heterotermes malbaricus</i> Snyder (Isoptera : Rhinotermitidae)	Books, wood work, Building	Subterranean, breeds in the ground, found throughout year	Sealing of cracks and crevices of basement of library, Use of pesticides in basement at library.
3.	<i>Cryptotermes</i> sp. (Isoptera : Kalotermitidae)	Books, furniture, calendars, photographs, Building	No connection with soil, Found throughout year	Sealing of cracks and crevices of basement of library, Use of pesticides in basement at library.
4.	<i>Odontotermes</i> sp. (Isoptera : Termitidae)	Books, furniture, woodwork; building	Small to medium sized, build large earthen cell; found throughout year	Sealing of cracks and crevices of basement of library, Use of pesticides in basement at library.
5.	<i>Nasutitermes</i> sp. (Isoptera : Termitidae)	Books, woodwork, articles, fences, wooden pols , wooden racks	Small sized, head nasutiform, rostrum pointed, found throughout year	Sealing of cracks and crevices of basement of library, Use of pesticides in basement at library.
6.	<i>Lepisma saccharina</i> Linn. (Thysanura : Lepismidae)	Books, calendars, silkcocoons	Carrot shaped, with silvery white scales, 12 mm long, eyes small, occur throughout year, overlapping generations noticed	Dusting 5% malathion/ DDT, fumigation of SO ₂ , heating library to 50-60°C
7.	<i>Thermobia domestica</i> Packard (Thysanura : Lepismidae)	Books, calendars, photos, silk cocoons	15 mm long, head black, thorax and abdomen with black and white bands, found throughout year	Dusting 5% malathion/ DDT, fumigation of SO ₂ , heating library to 50-60°C
8.	<i>Thermobia elongata</i> Sathe (Thysanura : Lepismidae)	Books, photos, wall papers, dumpen cottony & papery materials	12 mm long, head thorax, abdomen silvery, occur throughout year	Dusting 5% malathion/ DDT, fumigation of SO ₂ , heating library to 50-60°C
9.	<i>Thermobia diurnii</i> Sathe (Thysanura : Lepismidae)	Books, photos, wall papers, silk cocoons	13 mm long, head, thorax & abdomen silky black, occur throughout year	Dusting 5% malathion/ DDT, fumigation of SO ₂ , heating library to 50-60°C
10.	<i>Thermobia therma</i> Sathe (Thysanura : Lepismidae)	Books, wall papers, silk cocoons, old articles of animal origin	12 mm long, head & thorax grey, abdomen blackish, occur throughout year	Dusting 5% malathion/ DDT, fumigation of SO ₂ , heating library to 50-60°C
11.	<i>Thermobia orientalis</i> Sathe (Thysanura : Lepismidae)	Books, wall papers, silk cocoons, old articles of animal origin	15.6 mm, head, thorax grey, mothed black spots on abdomen	Dusting 5% malathion/ DDT, fumigation of SO ₂ , heating library to 50-60°C
12.	<i>Atropos</i> spp. (Psocoptera : Psocidae)	Books, wall papers & calendars, old books, animal or vegetable matter	0.8 mm long, louse like, antenna long, occur throughout year	Dusting 5% malathion/ DDT, fumigation of SO ₂ , heating library to 50-60°C
13.	<i>Liposcellis</i> spp. (Psocoptera : Psocidae)	Books, calendars, photographs, paper decorative eat shareby constraint of book bindings; dead insects and museum plants & animals	More than 1 mm long, light brown to pale yellow, pear shaped, with long antennae, Breed throughout year	Dusting 5% malathion/ DDT, fumigation of SO ₂ , heating library to 50-60°C



Fig-1 : Personal library



Fig-2 : Odontotermes (Winged termite)



Fig-3 : T. therma

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