BIOLOGICAL BASIS FOR INTEGRATED CONTROL OF TERMITES OF THE GENUS ISOPTERA, ANACANTHOTHERMS

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ABSTRACT

Termites (Isoptera, (Brullé, 1832)) are considered a real scourge in all tropical and warm countries, examples of which are the destruction of dwellings, furniture, clothing and footwear, desiccation of various wild plants, trees and conifers, irrigation canals, piers, suffice it to show that barges, dams and ulems are destroyed by water pressure due to thinning due to termite damage. Termites also cause complete destruction of books stored in many archives and libraries

INTRODUCTION

Representatives of the insect order termites (Isoptera, (Brullé, 1832)) are very widespread in nature, living in communities in various ecological environments associated with soil. Currently, more than 2900 species of termites are known, of which 120 species are classified as pests. Termites are a veritable scourge in all tropical and warm countries, such as destruction of dwellings, furniture, clothes and shoes, wilting of various wild plants, trees and conifers, thinning of irrigation canals, wharves, barges, dams and ulems due to termite damage is enough to show that it crumbles under water pressure. Termites also cause complete destruction of books stored in many archives and libraries.

Termites are insects that live in highly developed communities. In this respect, they have much in common with ants and bees. They live in a nest built on the ground or in special devices, forming a large community of many thousands of individuals. Termites in a community are made up of several phases and classes, which consist of workers, soldiers and sexual individuals that differ in appearance and function. The pair of individuals in a nest is a male and female termite, commonly referred to as the "king" and "queen". In the Central Asian republics, termites are known to inhabit mainly steppes and semi-deserts and foothills.

2 species belonging to the genus Anacanthotermes: Turkestan and large Caspian termites (A.turkestanicus Jacobs., A.ahngerianus Jacobs.) are widespread in Uzbekistan, especially in the next 20-30 years in almost all regions of our republic and in the republic. Karakalpakstan, households, agriculture, causing great damage to buildings and even historical monuments. The nest of Turkestan termites is often hidden underground, not far from buildings, and is almost invisible from the outside. They build paths along the walls of the building and congregate in the warm winter and cool summer rooms of the building. The

nest of the large Caspian termite is slightly higher than the ground surface and consists of a complex system of horizontal and vertical slits, chambers and corridors [1:2:3:5].

The first step in developing biological control measures for termites is to identify pathogenic entomopathogenic microorganisms and study their pathogenic properties. Among entomopathogenic microorganisms, the effects of bacteria, fungi and nematodes on termites have been studied to some extent. However, there are few studies on the practical use of entomopathogenic microorganisms against termites. In view of the above, it is necessary to develop a new, environmentally friendly, highly effective technology for termite control.

MATERIALS AND METHODS

Necessary materials for the research work were collected from the Koyi-Amudarya State Biosphere Reserve in natural conditions of Karakalpakstan of the Republic of Uzbekistan, from the historical museum of Ichan Castle of Kegaila district in anthropogenically transformed places, as well as from the Juma Reserve. Mosque, monument to Pahlavon Mahmud, Khiva city, Khorezm region. Attention was paid to 2 species of the genus Anacanthotermes in Uzbekistan: Turkestan and large Caspian termites (A. turkestanicus Jacobs., A. ahngerianus Jacobs.). In addition, the location of nests of termites belonging to the genus Anacanthotermes and isolation of microorganisms from their bodies during pest control were carried out. Also in the conditions of Uzbekistan A.A. The biological efficacy of Beauveria tenella VD-85 strain isolated from Asian locust (Locusta migratoria) (Patent No. IDP 04692 dated 23.03.2001) was studied by Nurzhanov et al. [4].

3.RESULTS AND DISCUSSION

In order to study the action of antimicroorganisms against termites of the genus Anacanthotermes, microorganisms belonging to different taxonomic groups were isolated from termites. From different regions of our republic 155 diseased and dead termite species were isolated and mycologically analysed, 111 of them, including 12 Aspergillus niger, 5 - Alternaria sp., 25 - Beauveria tenella, 12 - Penicillium sp., 46 - Mucor sp. , 4 - Actinomycetes sp. are separated. At the same time, B. tenella + Mucor sp. , 2 - B. tenella + Penicillium sp. were also observed fungal compounds. In addition, the plants eaten by termites as food are stems of sunflower (Helianthus annus L.) and technical sorghum (Sorghum technicus Rosher.), and the visible black spot fungus belongs to the family Dematiaceae: Alternaria alternata (Fr.) Keissler. , Cladosporium herbarum (Pers.) Lk, C. brevi-compactum Pidopl. et Deniak, Helminthosporium sp., Semphylium botryosum Wallr., S.ilicis Tengwal. species and the family Moniliaceae (Mucedinaceae), Aspergillus sulphureus (Fr.) Thom et Church, A.niger v. Tai, A. terreus Thom, Cephalosporium sp., Penicillium sp. species of Fusarium sp of the family Tuberculariaceae. and Mucor hiemalis of the class Phycomycetes, Rhisopus nigricans Her. types were separated (Table 1).

Table 1

Mycobiota of plants that termites consume as food

№	Types of mushroom	Industrial maize	Sunflower
1.	*Alternaria alternata*	+++	+
2.	*Aspergillus sulfurous*	+	+
3.	*A.niger*		+
4.	*A.terreus*	+	
5.	*Cephalosporium sp.*		+

6.	*Cladosporium brevi-compactum*	++	+
7.	*Cladosporium herbarum*	++	
8.	*Fusarium sp.*	+	
9.	*Mucor hiemalis*	+	
10.	*Penicillium notatum*	+	++
11.	*Penicillium sp.*		++
12.	*Rhisopus nigricans*	+	
13.	*Stemphylium botryosum*	+	
14.	*S.ilicis*		+
15.	*Helminthosporium sp.*	++	+

Note: occurrence of fungi +++ frequent, ++ average, + rare.

The pathogenicity of fungal species isolated from termites and food plants against termites was studied in laboratory conditions. The results show that most of the fungi of the studied groups are not highly pathogenic for termites.

2 species belonging to the genus Anacanthotermes: fungi isolated from termites of Turkestan and the Greater Caspian Sea (A.turkestanicus Jacobs., A.ahngerianus Jacobs.) and Beauveria tenella VD-85 strain isolated from Asian locust (Locusta migratoria) were tested for biological biological biological value. Efficacy against termites: strain tenella VD-85 was highly virulent in termite workers (Fig. 1).

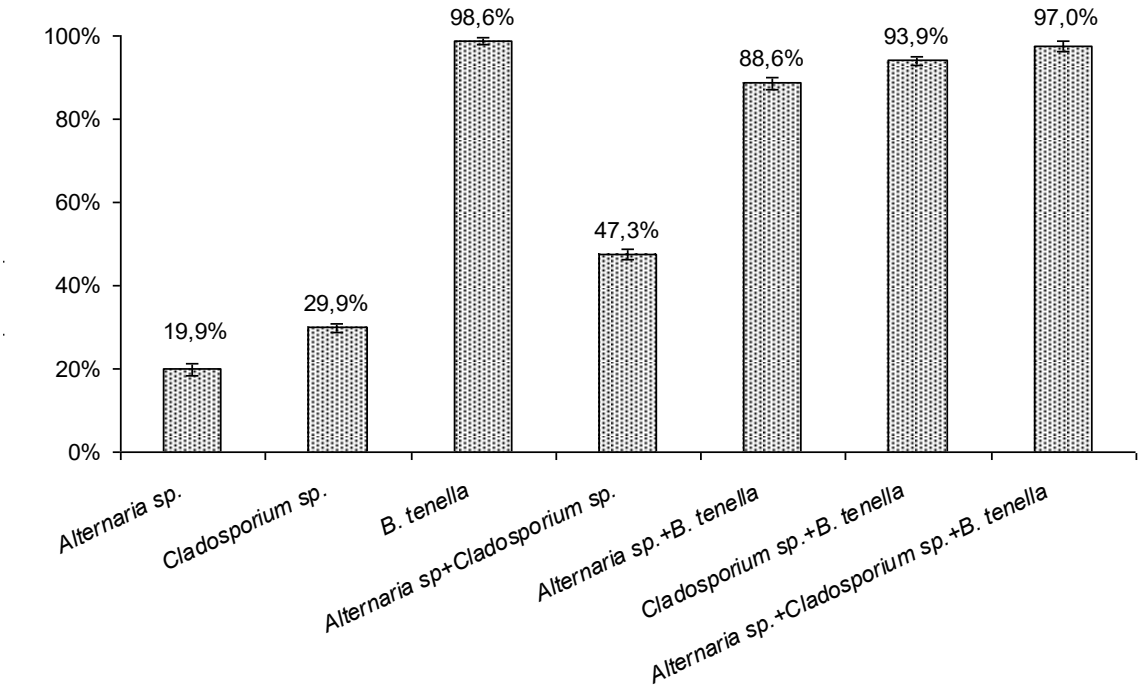

Figure 1: Biological efficacy of fungi against termites of the genus Anacanthotermes.

According to the results of the study, when the spores of the fungus were tested as food for termites, 98.6% of termites died when they were fed sunflower stalks mixed with spores of B. tenella fungus for 10 days in laboratory conditions. For the other fungi, these figures

were 19.9-29.9%. At the same time, the efficiency reached 88.6-97.0% when B. tenella was mixed with spores of fungi of low pathogenicity. Thus, Alternaria sp. 19.9%; Cladosporium sp. 29.9%; Alternaria sp.+Cladosporium sp. affected 47.3%, due to their very low pathogenicity, their use in developing an integrated control system is inappropriate. In the experiment, 30 worker termites were taken for each variant. In the control variant termites were not infected and turned into corpses.

In conclusion, microorganisms-fungi isolated from the mycobiota of plants used by termites of 2 species of the genus Anacanthotermes: Turkestan and large Caspian termites (A. turkestanicus Jacobs., A. ahngerianus Jacobs.) were not susceptible to the pest, isolated. from the Asian locust (Locusta migratoria) the VD-85 strain of the fungus Beauveria tenella was known for its high biological efficacy.

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