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DETERMINATION AND ANALYSIS OF THE DETERMINED COMPOSITION OF ENTOMOPATHOGENIC MICROMYCETES AND THEIR PTOXICITY IN TOMATOES

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ABSTRACT

The article provides data on the composition of local entomopathogenic fungi that infect the box worm the identification of their pathogenicity and their toxic effect on the pest. As a result of the study, 20 strains of fungi belonging to 12 genera of hyphal fungi of the Deuteromycota (Anamorphic fungi) division were identified. Analysis of the systematic composition of micromycetes showed the predominance of species of light-colored hyphomycetes , compared with dark-colored and tubercular. The largest number was noted in the genera Aspergillus Mich. - 5 species, Penicilium Lk., Fusarium Lk. and Alternaria Nees ex Fr., other genera included 1 species each. Pure cultures of Aspergillus flavus , A. fumigates, Trichotecium roseum and Fusarium lateritium were used in the experiment to identify the toxicity of identified species to wax moth caterpillars.

KEY WORDS: *entomopathogens, micromycetes, tomato, fungi, , toxicity, damage*

INTRODUCTION

Scientists of the world are developing scientifically based effective measures against diseases of tomato crops, types of disease-causing microorganisms, their development patterns, and bioecological characteristics of species of high economic importance. Such multifaceted scientific research work was carried out by scientists from USA, Brazil, Greece, Israel, Spain, Italy, Mexico, Tunisia, Turkey, China, India and other countries. Tomato growing is traditionally one of the leading branches of agriculture in Uzbekistan. It is known that crop losses from pests can be up to 40%, so Z.Adilov cites data that more than 40 species of insects and mites harm tomato during the growing season. Currently, a significant role in plant protection belongs to the biological control method, which is a powerful factor in increasing yields and product quality, reducing the use of pesticides and preventing environmental pollution with pesticides.

The essence of the biological method is the purposeful use of the antagonistic relationships that have developed in nature between pests of agricultural crops, their parasites and predators, as well as entomopathogens - the causative agents of fungal and viral diseases of pests.

Based on the main focus of our work - the study of hyphae fungi in Uzbekistan, we were interested, including entomopathogenic hyphae fungi.

Micromycetes are an extremely extensive and diverse group of organisms that play an important role in natural biocenoses and have a significant impact on the processes occurring in nature. The main group of fungi belong to saprotrophic organisms that carry out the processes of destruction of organic material, the other group of fungi causes diseases of plants and animals.

Entomopathogenic fungi attract the attention of specialists due to their their possible use as a means of suppressing the pest population. They affect natural biocenoses and pest populations, are able to reduce their numbers, and therefore are promising in biological pest control. About 40 preparations based on the use of entomopathogenic properties of microorganisms are used in agricultural practice [2]. Many researchers drew attention to the possibility of using entomopathogenic fungi [3]

Entomopathogenic fungi are an independent ecological group of micromycetes , whose vital activity is associated with insects and which affect the regulation of the number of insects in natural agro - and biocenoses.

In the conditions of Uzbekistan, one of the main pests of Tomato and vegetable crops is the Tomato bollworm. The biology of the cutworm is currently well studied [4], however, pathogens of the cutworm have not been previously studied.



MATERIAL AND METHODS OF WORK

The material for the study was dead and living larvae of the pest of different ages and adult individuals with signs of damage. The collection of insects was carried out on Tomato and tomatoes in the spring and summer seasons by route surveys in the Tashkent region. Based on the biology of the development of the pest - pupation of caterpillars in the surface layers of the soil, soil samples were taken from the upper layers (up to 15 cm) by excavation. The soil was sifted and the falling insects were selected [5].

Planning and conducting small and large field experiments, number of options and returns (repetitions), method of field selection, etc. It is carried out in accordance with "Procedural instructions...". The main task of researchers in testing seed drugs and biologically active substances is to objectively evaluate new foreign and domestic drugs and to create an assortment of seed drugs for major agricultural crops. In small field experiments, the biological efficiency of each drug in the test, the minimum and maximum consumption standards that are safe for the crop, the environment and humans, the convenience or inconvenience of using the medicinal form of the drug, the optimal treatment period for seeds, the effect of the drug on the quantity and quality of the protected plant crop are determined. Identification was carried out according to the determinant of E.Koval, also in the work were used the determinants of reconciliation mushrooms carried out on, Cannon, D. Minter, J. Staples and others Ainsworth & Bisby's dictionary.

The toxic effect of the identified micromycetes was established by immersing the larvae of the wax moth, which is produced in biolaboratories to obtain the entomophage of the bracon, a parasite of the Tomato bollworm, in extracts and cultural liquids of fungi for 20 seconds. and observed the development of the insect.

RESULTS OF EXPERIMENTS

Result of the our study, 15 strains of fungi belonging to 8 genera of hyphal fungi, Deuteromycota department. Analysis of the systematic composition of micromycetes predominance of species of light-colored hyphomycetes, compared with dark-colored and tubercular. The largest number was noted in the genera *Aspergillus* Mich.- 5 species, *Penicillium* Lk ., *Fusarium* Lk . and *Alternaria* Nees ex fr., the remaining genera included 1 species each (Table 1).

One of the objectives of our study was to determine the pathogenicity of the identified fungal strains and the toxic effect of the identified mycobiota . In domestic and foreign literature, enough data has been accumulated on the toxic properties of certain types of micromycetes [7].

The degree of pathogenicity of the identified micromycetes was established by artificially infecting caterpillars of older ages with the wax moth, which is produced in biolaboratories to obtain the entomophage of bracon, a parasite of the Tomato bollworm. Dry spore powder was applied to the surface of the caterpillars, which were kept for 15-45 days to identify the possibility of damage. Caterpillars in the control were not processed. The experiment was carried out on 30 tracks. The average percentage of damage was calculated.

Table 1.
Distribution of micromycetes isolated of tomato by systematic taxa.

	Family	Genus	Type
one	Moniliaceae	<i>Aspergillus</i> Mich.	<i>A. flavus</i> Lk. exFr.
2			<i>A. Niger</i> v.Tiegh .
3			<i>A. terreus</i> Thom.
4			<i>A. ochraceus</i> Wilhelm
5			<i>A. fumigatus</i> Fr.
6		<i>Cephalosporium</i> cda .	<i>C. acremonium</i> cda .
7		<i>Geotrichum</i> Lk. ex Pers.	<i>G. candidum</i> Lk. ex Pers.
8		<i>Penicillium</i> Lk.	<i>P. chrysogenum</i> Thom.
9			<i>P. frequentans</i> Westl .
10			<i>P. spinulosum</i> Thom.
11		<i>Scopulariopsis</i> Bain.	<i>S. brevicaulis</i> (Sacc .) Bain.
12		<i>Spicaria</i> Harting em . Harz	<i>S. heliothis</i> V.Charles
13		<i>Trichotecium</i> Lk. exFr.	<i>T. roseum</i> Lk. ex. fr.
14	Dematiaceae	<i>Alternaria</i> Nees ex Wallr .	<i>A. alternat a</i> (Fr.) Keiss .
15			<i>A. tenuissima</i> (Fr.) Wiltsh .
Total: 2		8	15

It follows from the presented data that the percentage of damage to wax moth caterpillars in the experiment with artificial infection ranges from 2 to 25%. In case of damage, on the 5-10th day, some individuals became inactive, lethargic, poorly responsive to irritation, various spots were observed on the surface of the caterpillars.



It should be noted that the pattern of death of caterpillars within 20 days was noted only in the case of *Aspergillus fumigatus* (4 %), *Aspergillus flavus*, *Trichotecium roseum*, and *Fusarium lateritium* caused the death of 2% plants. The dead caterpillars became hard, brittle, sometimes sporulation were observed on the surface of the insect.

Based on the data obtained, we can talk about the entomopathogenic properties of micromycetes *A. flavus*, *A. fumigatus*, *F. lateritium*, *Tr. roseum* and the effect of their culture liquid and extracts on living experimental insect larvae. Further work with these cultures may suggest the possibility of their use in the fight against harmful insects.

CONCLUSIONS

1. As a result of the study, 15 strains of fungi belonging to 8 genera of hyphal fungi, Deuteromycota department.
2. The percentage of damage to wax moth caterpillars in the experiment with artificial infection with dry spore powder ranged from 2 to 20%.
3. When determining toxicity, extracts and culture liquids of fungi were used. As a result of the experiment, it was found that the filtrates of culture fluids are more toxic than mushroom extracts. At the same time, a greater percentage of larval death was caused by 15-45-day filtrates of culture liquids, compared with 10-day ones.

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