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THE ANTAGONISTIC ACTIVITY OF FUNGUS *T. HARZIANUM* UZ CF – 55 AGAINST SOME PHYTOPATHOGENS

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ABSTRACT
Study of the antagonistic activity of T. harzianum Uz CF - 55-fungus strain noted that the fungus produces biologically active compounds possessing antagonistic activity against phytopathogenic fungi *studied Alternaria tenius, Aspergillus flavus, Fusarium vasinfectum, Verticillium dahliae, Fusarium solani, Fusarium oxysporum,* isolated from sick cotton plants. Biologically active agents contained in the cultural broth, and the weight of the spore-mycelium of fungus.

KEYWORDS: fungus *Trichoderma harzianum* 55, cultural broth, antagonistic activity, fungi phytopathogens.

1. INTRODUCTION

In recent years, interest in the microscopic fungi of the genus of Trichoderma is increasing due to the rapid development of biotechnology, which attracts the attention of researchers because of their practical value for the production of biologically active substances, plant protection products and as active destructor of plant polysaccharides. Working on the basis of their environmentally friendly technologies is an important area in environmental biotechnology.[1]

One of the possible mechanisms for attracting attention is the stability of the biological control agent to the stress due to better root system and capability to improve plant health. Improvement of the root system due Trichoderma, may lead to the emergence of resistance to pathogens that are not directly controlled. Infectivity and ability to hit the plants of many plant pathogens pectinolytic depends on the product, chitinolytic and cellulolytic enzymes, serine proteases to degrade the cell walls of plant cells. Biological control mechanism that can implement the kinds of Trichoderma is the destruction of plant pathogens by enzymes that reduces their infectivity.[2] In agricultural practice, the application of synthetic fertilizers and pesticides in agriculture focuses on the use of microorganisms that perform a similar function. Trichoderma is one of the most popular species of fungi are commercially available, contributing to the growth of fungi (PGPF) and as an agent of biological control. Operating a variety of secondary metabolites produced by different types of Trichoderma, is expanding its programs in agriculture and related industries. Application specific target secondary metabolites has the potential of Trichoderma as a plant pathogens as a replacement for commercially available.[3, 4, 5] Mico Trichoderma antagonism caused by the destruction of the cell wall of a plant pathogenic fungus, which entailed its destruction and death. This suggests that the cell wall enzymes (including antibiotics) are the main factors of biological control of Trichoderma. Among them hydrolases and chitinases play an important role. In addition, Trichoderma attack on the host hyphae is accompanied by significant morphological changes.[6]

The notion that biological products are less effective and accessible than chemical pesticides is wrong. Indeed, proponents of biological agriculture tend to introduce biological products in a system in which pesticides has a strong position and are more economical. In other words, they tried to implement the scheme biologics introduction of chemical remedies. However, in the international market already there are many effective pesticides to protect the seeds, often cheaper; pesticides stored on the seeds longer than biologicals and chemicals more effectively protect the seeds under different weather conditions.[7]

2. MATERIALS AND METHODS

The aim of this work was to study the activity of antagonistic fungus Trichoderma harzianum Uz CF - 55 with respect to phytopathogenic fungi, with a view to its

use in the development of biological products for plant protection.

In the research it was used a patented strain of fungus T. harzianum Uz CF - 55[8] isolated from soil samples under cotton, grown in Kashkadarya region. The antagonistic properties of the fungus was studied on Capek solid medium by four different methods: a method of agar blocks, of filter paper disc agar wells and perpendicular strokes. Experiments were conducted in three replicates. On the antagonistic fungus, activity was judged by the size of the zone of growth lack of the pathogen.[9] 6-days suspension of conidia of the test fungi pathogens seeded lawn in a Petri dish with Capek agar. 15 minutes after the sowing: 1) blocks of 4-day culture of T. harzianum Uz CF - 55 grown on an Mandels agar medium was applied under the test culture; 2) wells cut in seeded agar test culture of a pathogen, and then they were added to 0.1 ml of the culture broth of the fungus antagonist; 3) imposes paper discs with a diameter of 5-8 mm, which was applied for 0.01 ml of cultural broth of the fungus T. harzianum Uz CF - 55 4) Perpendicular to the grown culture-antagonist in 2-3 days sow pathogen fungi cultures.

The antagonistic activity of the fungus was determined against the following pathogenic fungi: *Alternaria tenius, Aspergillus flavus, Fusarium vasinfectum, Verticillium dahliae, Fusarium solani, Fusarium oxysporum*, isolated from diseased plants of cotton growing on saline soils of Bukhara region.

All values presented in the tables are the means of three replications. Data were statistically analyzed using analysis of variance (ANOVA) and expressed as mean ± standard error (SE). Significance was considered established at $P < 0.05$.

3. RESULTS AND DISCUSSION

Fungi of the genus Trichoderma are widely used as agents for the biological control of plant disease pathogens. At the recommendation of strain - producer to create biologics, as a rule, its ability to inhibit the growth of a number of plant pathogenic fungi and strain's manufacturability are accounted for.

The antagonistic effect of the fungus T. harzianum Uz CF - 55 with respect to the pathogen *Alternaria tenius, Aspergillus flavus, Fusarium vasinfectum, Verticillium dahliae, Fusarium solani, Fusarium oxysporum* shown in Table 1. As can be seen from the data presented in the table studied fungus showed sufficiently high antagonistic activity of all tested pathogens in all variants of the experiment. The most antagonistic activity of the fungus T. harzianum Uz CF - 55 has shown in relation to the F.solani, blind area of growth that ranged from 15 to 70 mm (Figure 1), F. vasinfectum (40-60 mm), F. oxysporum and Alternaria tenius from 10 to 40 mm. Complete suppression of the growth of Aspergillus flavus culture test and Verticillium dahliae observed when applying T. harzianum Uz CF -55 blocks.

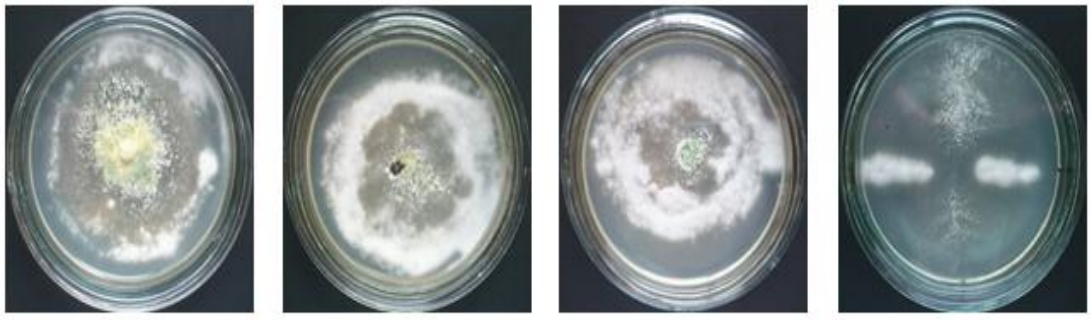

Fig. 1. The antagonistic properties of the fungus T. harzianum Uz CF -55 with respect to the method of F. solani: A- agar blocks; B- agar wells; C-filter discs; D- perpendicular strokes.

For example, the fungus F. solani (Fig. 1) was tested by all four methods. Determination of antagonistic activity of all used methods showed that the fungus T. harzianum Uz CF 55 inhibits or reduces the development of all our tested pathogens. The most effective it was in relation to the fungus Verticillium dahliae, because of inhibition of growth dy three tested methods.

When applying unit T. harzianum Uz CF 55 in the center of the Petri dish to a culture of F. solani, seeded lawn area with the lack of growth of the pathogen was 70 mm. In the study of antagonistic activity by hole diameter zone of absence of growth of the fungus F. solani (Fig. 1 B) was 50 mm. When applying paper disc with 0.01 ml of the cultural broth of the fungus T. harzianum zone of growth lack of the pathogen was 25 mm (Figure 1 C).

When comparing the method of agar wells containing 0.1 mL of T. harzianum QL method with paper discs with 0.01 ml of QOL, it is clear that the lack of growth of the pathogen area is directly proportional to the volume of introduced QOL. The data presented in Table. 1 show that all investigated methods are acceptable in all versions of the experiments found no growth zone of F.solani. The concentration of introduced cultural broth

of T. harzianum Uz CF 55 is proportional to the changed value of the area of absence of the pathogen growth.

Table 1: The antagonistic effect of the fungus T. harzianum Uz CF - 55 to phytopathogens (3-4 days of growth)

№	number options experience	*Fusarium oxysporum*	*Aspergillus flavus*	*Verticillium dahliae*	*Fusarium solani*	*AlternariaTenus*	*Fusarium vasinfectum*
	pathogen growth inhibition zone (mm)						
1	Agar wells	40±5	complete inhibition of growth of the pathogen	Complete suppression of growth of the pathogen	50±4,61	10±1,73	40±1,15
2	The filter discs	30±1,84	10±1,54	Complete inhibition of growth of the pathogen	25±1,68	10±1,53	60±3,2
3	agar blocks	40±1,54	10±1,52	10,4±0,73	70±2,51	40±1,73	40±2,08
4	Perpendicular strokes	10±0,8	Complete inhibition of growth of the pathogen	complete inhibition of growth of the pathogen	15±1,15	40±1,52	40±1,73

Study of antagonistic activity of fungal strain T. harzianum Uz CF - 55 showed that the fungus produces biologically active compounds possessing antagonistic activity against all pathogens studied. Biologically active substances contained in the cultural broth, and the spore-mycelium mass of the fungus (Figure 1).

4. CONCLUSION

On the basis of these studies was found that the fungus T. harzianum Uz CF - 55 is a producer of metabolites with high antibiotic activity related a number of micromycetes. Shown pronounced inhibitory effect of fungal pathogens such as the Alternaria tenius, Aspergillus flavus, Fusarium vasinfectum, Verticillium dahliae, Fusarium solani, Fusarium oxysporum. The obtained data can serve as a basis for the development of a biological product with antifungal properties.

5. RECOMMENDATIONS

Cultural broth of Trichoderma harzianum UZ CF - 55 produces growth-stimulating substances, organic acids, phosphatase, cellulolytic enzymes and antibiotics. It has high antagonistic properties against phytopathogenic fungi. Recommended for use in protecting crops against fungal and bacterial diseases.

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