



ANTAGONISTIC INTERACTIONS OF SOIL SAPROPHYTE BACTERIA WITH PATHOGENS OF COTTON DISEASES

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ABSTRACT

In the paper are discussed questions of the research to find new antagonistic microbes. The results obtained on the action of the investigated 5 microorganisms-antagonists (Bacillus megaterium, Bacillus brevis, Streptomyces sp Pseudomonas fluorescens, Bacillus thurengensis) to seven species of phytopathogenic microorganisms (Fusarium oxysporium,) are presented in the article.

On the basis of the received data the conclusion has been drawn that the revealed kinds to some extent possess defined, but the yielded strains in a kind of weak virulence cannot be applied in the practical purposes.

KEYWORDS: cotton diseases, antagonistic microbes, damages, pathogen, Bacillus megaterium, Pseudomonas fluorescens.

INTRODUCTION

To date, a large amount of factual material has been accumulated, indicating the promising use of antagonist microbes in the fight against pathogens and plant diseases [2].

In this regard, research on the search for new antagonist microbes used in this direction is acquiring even greater relevance.

To study antagonists to 7 types of pathogens of cotton, grain and berry crops, we used five strains of soil, saprophytic bacteria from the collection of museum cultures of the Institute of Microbiology [3]. The study of the antagonistic effect of

microorganisms on phytopathogenic bacteria was carried out according to the Cooksey Moore method. The investigated microorganisms were grown on glucose agar, and the test cultures on potato agar. The size of the zone of inhibition of the growth of phytopathogenic bacteria was determined after 48 hours [1]. The results obtained on the action of the investigated 5 microorganisms-antagonists (Bacillus megaterium, Bacillus brevis, Streptomyces sp Pseudomonas fluorescens, Bacillus thurengensis) to seven species of phytopathogenic microorganisms (Fusarium oxysporium) are presented in the table.



Table 1
Antagonistic spectrum of the studied microorganisms

The investigated microorganisms - antagonists	Phytopathogenic microorganisms					
	Fusarium oxysporium		Rhizoctonia solani		Xanthomonas malvacearum	
	C	Z	C	Z	C	Z
1. Bacillus megaterium	7	12	8	13	10	26
2. Bacillus brevis	-	-	-	-	-	-
3. Streptomyces sp	5	8	6	12	9	16
4. Pseudomonas fluorescens	10	18	12	18	10	30
5. Bacillus thurengensis	6	12	10	16	16	20

C - colony diameter in mm

Z - diameter of the zone of no growth in mm

The table shows that the cultures of Pseudomonas fluorescens and Bacillus megaterium showed the best bactericidal effect against Xanthomonas malvacearum and Fusarium oxysporium and Rhizoctonia solani. An insignificant bactericidal effect was shown by the culture of Streptomyces sp to all pathogens causing diseases of cotton seedlings.

Bacillus megaterium and Pseudomonas fluorescens have shown good antibacterial properties against 3 types of phytopathogenic microorganisms. These cultures had a pronounced antagonism; the diameter of the zone of no growth in these cultures corresponded to 12, 13, 26, 16 and 20 mm. (Table. 1)

All studied antagonists did not show antibacterial properties to all investigated phytopathogenic microorganisms in the Bacillus brevis strain, however, it should be noted that the Pseudomonas fluorescens strain has good antibacterial properties, since it showed a broader spectrum of action in this variant.

Thus, the study of the antimicrobial action of the studied microorganisms on phytopathogenic microorganisms showed that all 4 strains showed an antimicrobial spectrum to phytopathogenic microorganisms in terms of the spectrum of action and their antibiotic activity was different.

Based on the data obtained, it can be concluded that antagonism in the studied bacteria in relation to phytopathogenic microorganisms was observed in some cases actively, in others weakly. In this regard, we have selected the most active antagonist bacteria (Bacillus megaterium and Pseudomonas fluorescens) for further research.

Data on the antibiotic activity of microorganisms indicate the possibility of using some of them to limit the infection caused by phytopathogenic microorganisms and to develop biological methods for combating plant diseases.

CONCLUSIONS

1. The phenomenon of antagonism to phytopathogenic microorganisms was manifested not alone in all studied antagonist bacteria.
2. The highest antibiotic activity and a wide spectrum of action against the studied phytopathogens was found in the Bacillus megaterium and Pseudomonas fluorescens strains.
3. Bacillus megaterium and Pseudomonas fluorescens are the most active antagonists, which may later be used to develop biological methods for beavers with diseases of cotton seedlings.

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