THE YEAST *WICKERHAMOMYCES ANOMALUS* AS A PROMISING BIOCONTROL AGENT AGAINST *ASPERGILLUS* PLANT PATHOGENS

Nadejda EFREMOVA[1]*, Natalia CHISELIȚA[1], Oleg CHISELIȚA[1], Cristina MOLDOVAN[1], Vladimir GRIBINCEA[2]
[1] Institute of Microbiology and Biotechnology, Technical University of Moldova, Chisinau, Republic of Moldova
[2] National Center for Seed Research and Production

*Corresponding author: nadejda.efremova@gmail.com

https://doi.org/10.52757/bsd26.36

Background: The sustainability of modern agricultural systems is critically dependent on the availability of safe and effective plant protection pathways. Synthetic pesticides, despite their efficacy, are associated with a range of negative consequences including environmental persistence, disruption of beneficial soil communities, the progressive development of resistant pathogen strains. In recent years the contamination of crops and post-harvest plant products by *A. fumigatus* has been increasingly reported. Also, *Aspergillus flavus* is an opportunistic phytopathogen that affects numerous crops, including *Zea mays*. The integration of biological control strategies into modern crop production provides an alternative to the application of synthetic chemical fungicides.
The aim of the present study was to identify the antifungal activity of *Wickerhamomyces* yeast against *Aspergillus* spp. strains.
Materials and methods: For the study as the objects of study were used yeast and fungal strains from the National Collection of Nonpathogenic Microorganisms (NCNM) of the IMB of the Technical University of Moldova. The antifungal activity was investigated using cup plate agar diffusion method.
Results: Following investigation, the antagonistic potential of *W. anomalus* CNMN-YS-07 biomass and liquid culture was clearly evidenced by its capacity to suppress mycelial development in both *A. fumigatus* and *A. flavus*. The yeast biomass exhibited superior inhibitory performance, with the greatest suppression recorded against *A. fumigatus* (inhibition zone 34.33 ± 0.57 mm), followed by *A. flavus* (20.66 ± 0.57 mm). Importantly, antifungal activity, also detected in the liquid culture filtrate, has demonstrated similar antagonistic effect, expressed by the inhibition zone of 25.66 ± 0.50 mm and 18.66 ± 0.57 mm against *A. fumigatus* and *A. flavus*, respectively.
Conclusions: These observations suggest the contribution of both biomass and culture liqiud to the overall antifungal mechanism of this strain. The findings indicate that *Wickerhamomyces anomalus* CNMN-YS-07 possesses high potential as a biofungicide for the management of *Aspergillus* spp. in agricultural systems offering a basis for its further evaluation under laboratory and field conditions.
Keywords: yeast, antifungal activity, biocontrol agent, *Aspergillus* spp.

Acknowledgments: The results were obtained within the Project 25.80012.5107.16SE - DEFEND – Development of ecological and natural fungicides based on yeast- funded by the National Agency for Research and Development (NARD).