

Effect of preparations Biosar and Beta-Chikol on growth and sporulation of *Botrytis cinerea* Pers. and *Fusarium* spp.

Ewa D. Król, Beata Zimowska

University of Life Sciences, Faculty of Horticulture and Landscape Architecture, Department of Plant Protection, Subdepartment of Phytopathology and Mycology, Leszczyńskiego 7, 20-069 Lublin

INTRODUCTION

Botrytis cinerea and fungi from the genus *Fusarium* belong to dangerous pathogens of many plant species. The aim of studies was investigate the effect of plant growth stimulants Biosar (based on grapefruit extract) and Beta-Chikol (based on chitosan) on *in vitro* growth of *Botrytis cinerea*, *Fusarium culmorum*, *F. oxysporum* and *Neocosmospora solani*.

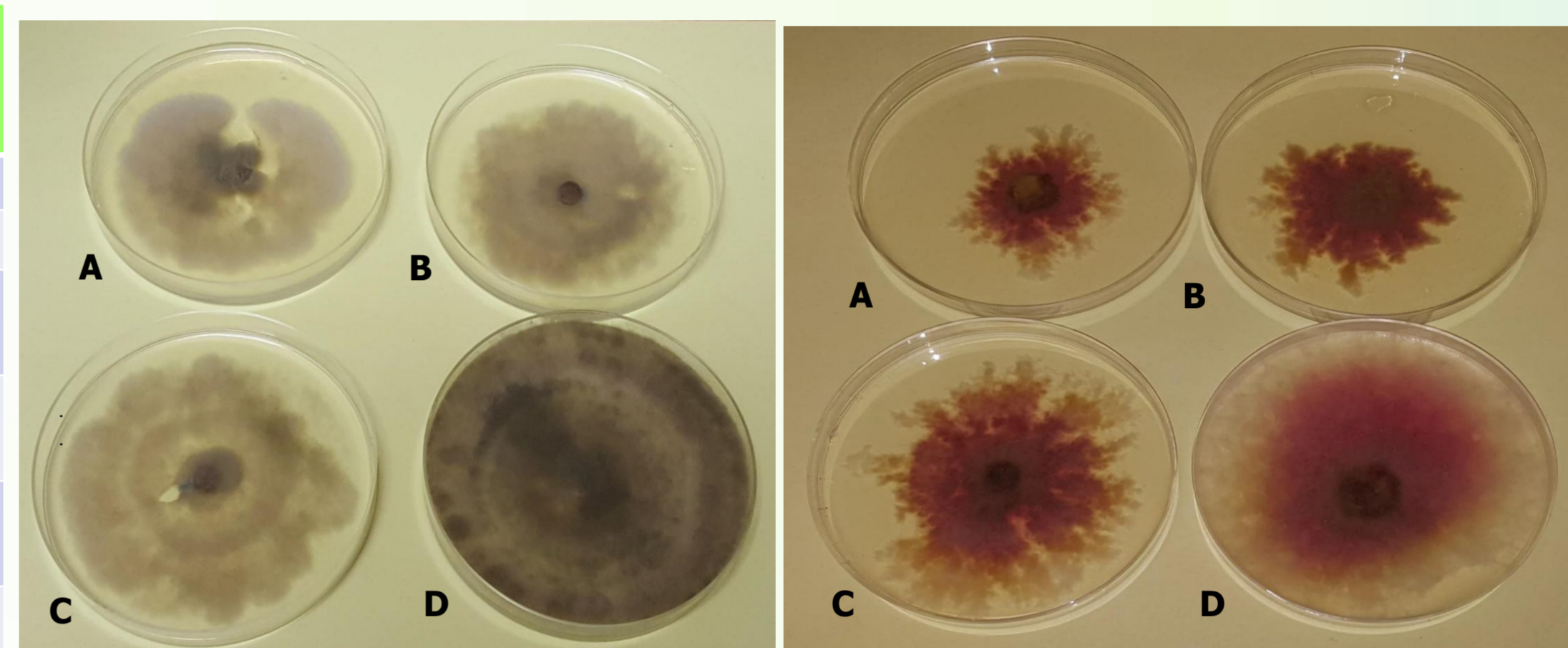
MATERIAL AND METHODS

Examined preparations were added to malt extract agar (MEA) to obtain suitable concentrations within the ranges recommended by the producers, which were 0.05%; 0.075%; 0.1% for Biosar and 1%; 2%; 2.5% for Beta - Chikol. Such prepared substrate was poured into 85 mm Petri dishes and inoculated with 3 mm mycelial disk of appropriate fungus species. Measurements of the growth of fungal colonies were taken after 4 and 8 days of incubation. Antifungal activity was determined by comparing the fungal growth on the substrates containing natural substances with the control one (without the addition of preparations).

RESULTS

The influence of the studied compounds was differentiated and depended on the substances, its concentration, time and fungal species. Generally, the diameters of the *B. cinerea*, *Fusarium culmorum*, *F. oxysporum* and *Neocosmospora solani* colonies decreased with increasing concentration of the preparation.

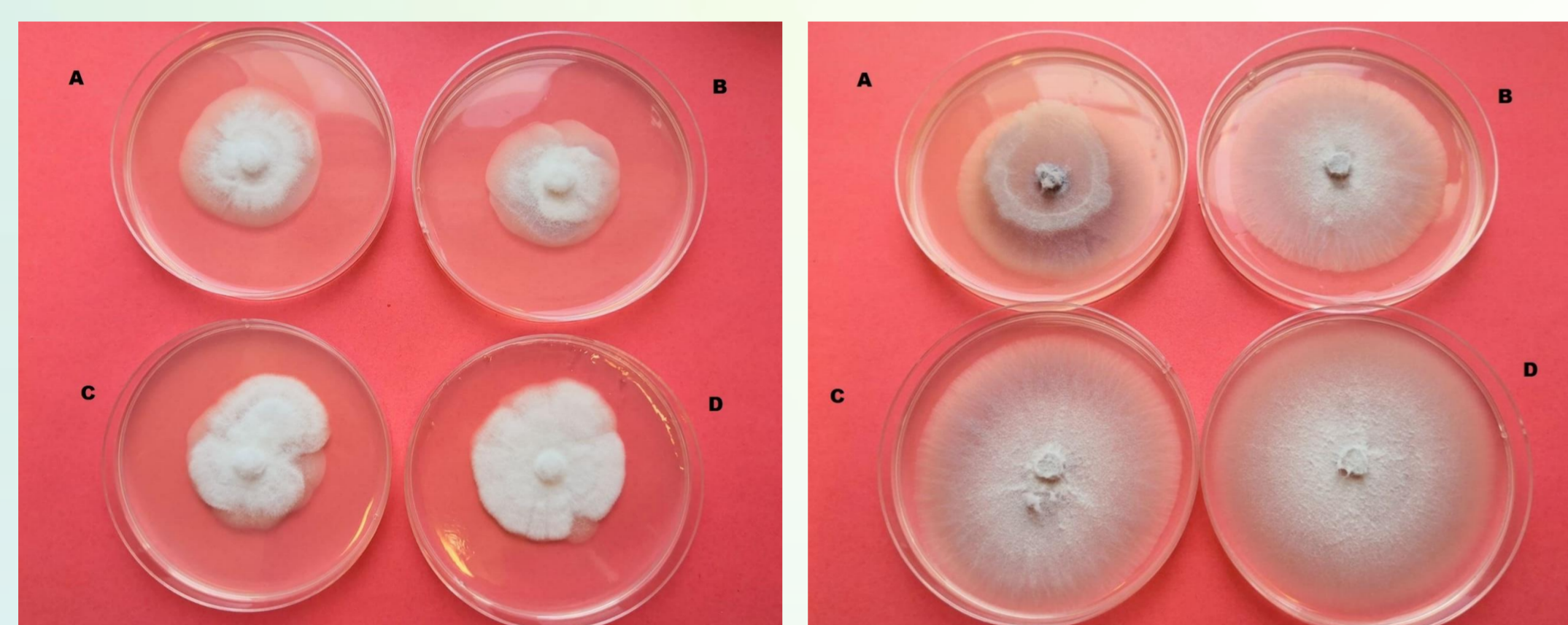
Fungus species	Diameter of colonies in mm (percent of colony growth inhibition)						
	BIOSAR		BETA-CHIKOL			CONTROL	
	Concentration of preparations						
	0,1%	0,075%	0,05%	2.5%	2%	1%	
<i>Botrytis cinerea</i>	21,3 (66,2)	29,6 (53)	33,6 (46,7)	42 (33,3)	50 (20,6)	54 (14,3)	63
<i>Fusarium culmorum</i>	25,7 (26)	28,3 (18,4)	34,3 (1,1)	20 (42,4)	24 (30,8)	28 (19,3)	34,7
<i>Fusarium oxysporum</i>	33 (31,25)	36 (25)	42 (12,5)	40 (16,66)	45 (6,25)	47 (2,1)	48
<i>Neocosmospora solani</i>	25 (34,21)	27 (28,94)	39 (21,05)	33 (13,15)	35 (7,89)	37 (1,02)	38



Eight-day colonies of *Botrytis cinerea* on MEA with the addition of Biosar at concentrations of 0.1% (A), 0.075% (B), 0.05% (C) and control (D)

Eight-day colonies of *Fusarium culmorum* on MEA with the addition of Biosar at concentrations of 0.1% (A), 0.075% (B), 0.05% (C) and control (D)

Effect of preparations on growth of studied fungal species after 4 days of culture.



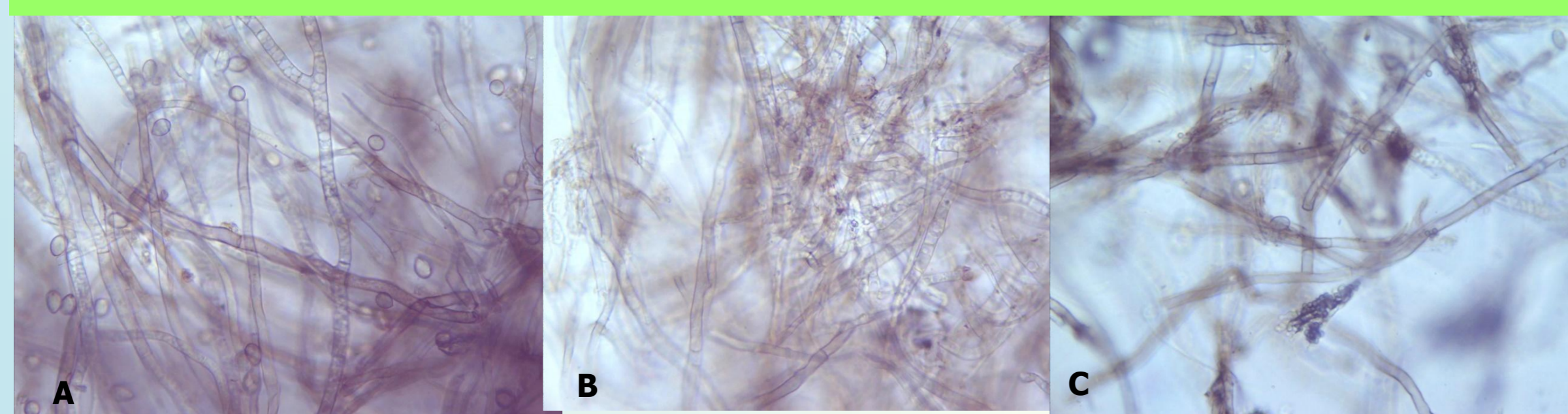
Four-day colonies of *Fusarium oxysporum* on MEA with the addition of Biosar at concentrations of 0.1% (A), 0.075% (B), 0.05% (C) and control (D)

Eight-day colonies of *Neocosmospora solani* on MEA with the addition of Biosar at concentrations of 0.1% (A), 0.075% (B), 0.05% (C) and control (D)

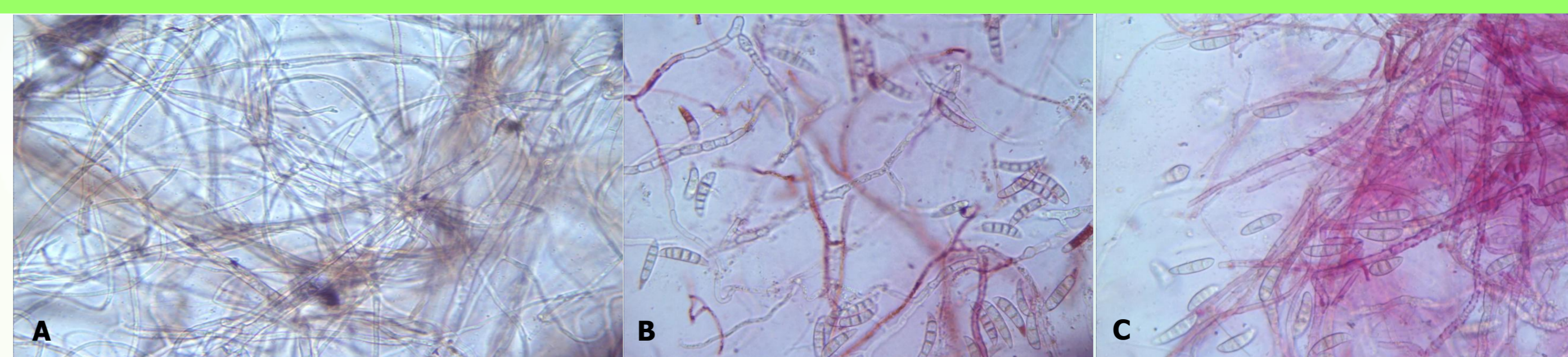
Fungus species	Diameter of colonies in mm (percent of colony growth inhibition)						
	BIOSAR		BETA-CHIKOL			CONTROL	
	Concentration of preparations						
	0,1%	0,075%	0,05%	2.5%	2%	1%	
<i>Botrytis cinerea</i>	65 (23,5)	73,3 (13,8)	78 (8,2)	55 (35,3)	61,3 (27,9)	70 (17,6)	85
<i>Fusarium culmorum</i>	43,3 (49)	58,7 (31)	70 (17,6)	36 (57,6)	40 (53)	46,3 (45,5)	85
<i>Fusarium oxysporum</i>	63 (21,25)	63 (21,25)	69 (13,75)	40 (50)	46 (42,5)	61 (23,75)	80
<i>Neocosmospora solani</i>	41 (43,1)	42 (41,7)	44 (38,9)	27 (62,5)	30 (58,3)	32 (55,6)	72

Effect of preparations on growth of studied fungal species after 8 days of culture

- After 4 days of the experiment, higher antifungal activity against these fungi was observed for Biosar than for Beta-Chikol, as indicated by higher percentages of colony growth inhibition of 3 species of fungi, i.e. *B. cinerea*, *F. oxysporum* and *N. solani*. Only in the case of *F. culmorum* stronger growth inhibition by Beta-Chikol than by Biosar was showed.
- However, the opposite situation was observed after 8 days of culture. The former preparation reduced the growth of colonies of all tested fungi less than the latter one.
- Simultaneously negative changes in the macroscopic appearance of the colony as well as in the morphological structures of fungi growing at higher concentrations of Biosar and Beta - Chikol was observed. All species of examined fungi formed poorer aerial mycelium, their hyphae were usually deformed and sporulation weaker compared to the control.



Morphological structures of *Botrytis cinerea* on control medium (A), on medium with Biosar at 0.1% (B) and on medium with Beta-Chikol at 2% (C)



Morphological structures of *Fusarium culmorum* on control medium (A), on medium with Biosar at 0.1% (B) and on medium with Beta-Chikol at 2% (C)