

The effect of non-thermal plasma on spores of phytopathogenic fungi using *Penicillium* spp. as a model

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Ensuring the phytosanitary safety of seed material is a complex task, as spores of phytopathogenic fungi exhibit high resistance to the action of pesticides (fungicides). Plasma technologies in agriculture are actively being developed, among other applications, as an environmentally friendly alternative to pesticides. Treatment with non-thermal plasma effectively decontaminates seeds, combats resistant phytopathogens, and stimulates plant growth [1, 2], leaving no harmful chemical residues [2]. The aim of this study was to investigate the effect of non-thermal plasma on the spores of phytopathogenic fungi using *Penicillium* spp. as a model organism. The effect of non-thermal plasma was studied on *Penicillium* spp. spores isolated from the seeds of spring barley (*Hordeum vulgare* L.). A spore suspension was prepared by filtration to remove mycelium and applied onto the surface of a nutrient medium. The cultures were treated using a non-thermal microwave argon plasma source developed at the Kurchatov Complex of Radiology and Agroecology of the National Research Center “Kurchatov Institute” (KCRA, Obninsk) [3]. The experiment demonstrated a strong fungicidal effect, which was dose-dependent: the longer the exposure time (1—20 min), the fewer spores retained viability.

[1] Scholtz V, Jiresova J, Sera B, Julak J 2021 *Foods* 10(12) 2927

[2] Bilea F, Garcia-Vaquero M, Magureanu M, Mihaila I, Mildaziene V, Mozetic M, Zukiene R 2024 *Critical Reviews in Plant Sciences* 43(6) 428-486

[3] Gorbатов S A, Ivanov I A, Tixonov A V, Tixonov V N, Shes-terikov A Yu 2021 *Pribory i texnika eksperimenta* (1) 155-156