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PATHOGENS OF FUNGAL DISEASES OF CEREAL CROPS IN NORTH KAZAKHSTAN'S WHEAT

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Kazakhstan ranks 14th in wheat production, which underlines the importance of the agro-industrial complex for the country's economy [1-2]. Harmful organisms, particularly phytopathogenic fungi, pose a significant threat to agricultural crops, causing significant biotic stress and serious losses in wheat production [3]. In Northern Kazakhstan, diseases such as *Alternaria sp.*, *Helminthosporium sp.*, and *Fusarium sp.* are common, which affect key parts of plants, including stems and root systems, and contribute to the development of complex diseases, such as leaf spotting [4]. Phytopathogenic fungi not only disrupt the functioning of the plant but also secrete mycotoxins—secondary metabolites that pollute agricultural products [5-6].

Natural antagonists are being actively studied to combat pathogens. Studies show the effectiveness of *Pseudomonas sp.* in the suppression of *Fusarium oxysporum* in wheat [7]. Some *Trichoderma* species can also be used to control root rot pathogens, such as *B. Sorokiana* [8]. However, it is important to take into account that the effectiveness of biological products depends on soil and climatic conditions, which requires the study of local species of microorganisms to create effective means of combating phytopathogens [9]. The aim of the work is to isolate and study phytopathogenic fungi of North Kazakhstan, especially in areas where wheat cultivation is one of the key crops.

The study examined 20 samples of phytopathogenic fungi. The following media were used for seed analysis using the nutrient media method: potato agar, potato-glucose agar. To get rid of bacteria, the crops of the studied fungi and the primary isolation of

cultures are carried out on media with a pH of 4.0 with the addition of antibiotics with a wide spectrum of antibacterial action (kanamycin, etc.) in a concentration of 1-2 g/l of the nutrient medium [10]. The sterilized agar was poured into Petri dishes or Koch cups, and after solidification the seeds in question were laid out on them. Biological methods based on culture on nutrient media make it possible to identify pathogens of diseases such as *Fusarium spp*., *Alternaria spp*. and *Septoria spp*. These methods provide induction of the growth and development of pathogens in infected seeds, which contributes to their detection and identification. [12] *Tilletia caries, Ustilago tritici, Ustilago nuda,* and *Ustilago hordei* were identified by morphological and cultural characteristics. Root rot pathogens — *Fusarium spp.* and *Helminthosporiosis spp.* (pathogens—fungi of the genera *Fusarium* and *Septoria*) Helminthosporiosis (*Bipolaris sorokiniana*) is the most common and harmful to spring crops, especially spring barley. Fungi of the genus *Trichoderma* have also been discovered. They mainly play the role of an antagonist against wheat pathogens and regulate the microflora in the soil [13-14].

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