UDC 632.4:633.35
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MYCOBIOME OF PEA SEEDS

Pea (*Pisum sativum* L.) is an indispensable source of plant protein, which is comparable to animal proteins in terms of nutritional value and amino acid composition. It possesses a unique ability to fix nitrogen through symbiosis with nodule-forming bacteria, allowing it to accumulate 60–100 kg/ha of nitrogen in the soil. Peas are considered one of the best preceding crops in a crop rotation, as they improve soil structure and increase yields, particularly of winter wheat. Growing peas contributes to the ecologization of agriculture, allowing for a significant reduction in the use of synthetic mineral fertilizers.

Despite these advantages, pea yield can be limited by various diseases, including seed infections, which lead to a decrease in seed germination, rotting of roots and sprouts, and stunted plant growth, as a result, thinning of the crops.

The aim of this study was to investigate the species composition and structure of the pea seed mycobiome, determine the prevalence of micromycetes, and assess their impact on the sowing quality of seed material.

The phytopathological examination of pea seeds was conducted at the Problem-Oriented Research Laboratory of Mycology and Phytopathology of the Department of Phytopathology named after Academician V. F. Peresypkin at the National University of Life and Environmental Sciences of Ukraine. For this purpose, methodologies specified in DSTU 4138-2002 «Seeds of Agricultural Crops. Methods for Determining Quality» were used. Seed samples from the 2025 harvest were obtained from farms in the Kyiv, Odesa, and Khmelnytskyi regions.

A study of seed infection in the pea harvest from the Kyiv region revealed the occurrence frequency of the micromycete *Cladosporium herbarum* (Pers.) Link in the range of 18,5–88,3%. The prevalence of the fungi *Alternaria alternata* (Fr.) Keissl. and *Penicillium* spp. was 2,5–5,0% and 0,7–1,6%, respectively. Additionally, 0.2–3.3% of seeds in the tested samples were found to be infected with *Ascochyta pisi* Lib.

Analysis of seed samples grown in the conditions of the Khmelnytskyi region allowed for the detection of *Fusarium* spp. infection within the range of 2,5–65,5%. The occurrence frequency of *Penicillium* spp. was 3,2–11,5%, *A. alternate* – 4,2–9,0%, and *Sclerotinia sclerotiorum* (Lib.) de Bary – 0,5–3,0%.

Pea seeds from the Odesa region were infected with pathogens causing *Alternaria* spp. – 7,5–24,0%, *Fusarium* spp. – 1,5–18,0%, and *Penicillium* spp. – 0,2–2,5%.

Research on pea seeds grown in the Kyiv, Khmelnytskyi, and Odesa regions confirmed their infection with pathogens, among which the most common are the micromycetes *C. herbarum* (up to 88.3%) and *Fusarium* spp. (up to 65.5%). The level of seed infection by dangerous fungi such as *A. pisi* and *S. sclerotiorum* was established; these pose a significant threat due to a substantial reduction in seed germination and the deterioration of the phytosanitary condition of future crops.

C. herbarum and *A. alternata* are representatives of the mycobiota that colonize the seed surface in field conditions during ripening or during the harvesting process. In our studies, their impact on germination energy and germination was negligible. *Fusarium* spp. in the samples studied were also, in most cases, in the form of surface infection. This means that seed contamination occurred during the pre-harvest period.

Although epiphytes may not directly reduce seed germination, their high concentration is a indicator of growing conditions (e.g., frequent rains during the ripening period), which requires attention when selecting a seed treatment in the future.

UDC 633.11:631.95:575.22
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MODERN WINTER WHEAT VARIETIES VARIABILITY DEPENDENT ON ENVIRONMENTAL CONDITIONS

Stable grain production and satisfactory economic returns continue to rank among the principal objectives of both plant breeding and agricultural practice. In the case of winter wheat, modern cultivars are required not only to achieve high yield levels when environmental conditions are favorable, but also to maintain dependable performance under variable and often contrasting production settings. In practical terms, the value of a cultivar is determined not simply by its maximum productivity, but by the extent to which its genetic potential can be realized consistently across diverse combinations of