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Fungal diseases of corn seeds

Myroslaw Pikovskyi*

Doctor of Agricultural Sciences, Professor
National University of Life and Environmental Sciences of Ukraine
03041, 15 Heroiv Oborony Str., Kyiv, Ukraine
https://orcid.org/0000-0003-0689-604X

Volodymyr Dudchenko

Doctor of Economics, Professor
Kherson State Agrarian and Economic University
73006, 23 Stritenska Str., Kherson, Ukraine
https://orcid.org/0000-0001-8545-7904

Viktoriia Melnyk

PhD in Agricultural Sciences, Associate Professor
National University of Life and Environmental Sciences of Ukraine
03041, 15 Heroiv Oborony Str., Kyiv, Ukraine
https://orcid.org/0000-0002-8782-1236

Abstract. Corn is a strategic crop with growing demand, which necessitates increased production and the use of healthy seeds to improve yields and product quality. The purpose of the study was to investigate the symptoms of fungal diseases of corn seeds and establish the spread of micromycetes. The study of diseases of corn cobs and seeds was carried out in the Problem Research Laboratory of Mycology and Phytopathology of the Department of Phytopathology of the National University of Life and Environmental Sciences of Ukraine. Samples of plant material (cobs) for diagnostics were taken during route surveys in the Forest-Steppe of Ukraine and during the period of their storage. Seed samples were taken after harvesting. Diagnosis of diseases was carried out by visual examination and biological method (seed germination in wet chambers and on a nutrient medium). Microscopic analysis of their morphological structures was performed to identify micromycetes. The frequency of occurrence of micromycetes was determined during seed germination in petri dishes on filter paper. During the studies, infection of corn cobs and grains with various micromycetes was detected (*Trichothecium* spp., *Fusarium* spp., *Alternaria* spp., *Cladosporium* spp., *Aspergillus* spp., *Mucor* spp., *Penicillium* spp., *Rhizopus* spp.), which caused the variability of disease symptoms. The parasitism of the fungi *Botrytis cinerea*

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*Corresponding author

and *Bipolaris* spp. on ears of corn was established, which was not disclosed in the national scientific literature. The highest frequency of occurrence on corn seeds was characterised by representatives of the genus *Alternaria* – 18.4%. Fungi of genera *Cladosporium* and *Penicillium* were detected on 4.5 and 4.7% of seeds, respectively. Seed infection with *Fusarium* spp. was 2.7%, *Mucor* spp. – 2.6%. Representatives of the genus *Rhizopus* were identified on 1.1% of seeds. Fungi of genera *Trichothecium* and *Aspergillus* were 0.4 and 0.6%. Therefore, monitoring of fungal pathogens and their phytopathological examination are necessary to assess the quality of corn seeds. Information on the symptoms of mycoses, the species composition of micromycetes should be used in the diagnosis of seed pathologies

Keywords: diagnostic signs; mould; fusarium; micromycetes; grain; germination

Introduction

Research on fungal diseases of corn seeds is necessary because of their impact on germination, plant viability, and overall crop yield. Seeds infected with pathogenic fungi can become a source of primary infection of crops, which leads to a decrease in yield and deterioration of grain quality. Some pathogens, in particular, *Fusarium* spp. and *Aspergillus* spp. and *Penicillium* spp., not only affect seeds but also produce mycotoxins that are dangerous to human and animal health, which reduces the nutritional and feed value of grain. In addition, the affected seed is less resistant to adverse environmental conditions, which can lead to its death even in the early stages of germination or to the appearance of weakened plants with low productivity. In a changing climate and the intensification of agricultural production, the risks of developing fungal diseases increase, which requires a comprehensive approach to monitoring, diagnosing, and controlling these pathogens. The development of effective methods of seed disinfection, introduction of sustainable varieties and improvement of plant protection technologies are important tasks of modern agricultural science, as they contribute to stable corn production, increase its yield, and ensure food security.

Corn is a strategic crop. As noted by O. Erenstein *et al.* (2022), it is the world leader in grain consumption, with annual production exceeding 1 billion tonnes. M.S. Azadi *et al.* (2022) noted the role of corn as a food crop for an estimated 4.5 billion people in 94 developing countries, providing about 30% of their daily calorie needs. In addition, 63% of corn grown worldwide is a significant source of oil, starch, biofuels, and is also used as animal feed. O. Erenstein *et al.* (2022), emphasised that countries such as the United States, Brazil, China, Ukraine, Argentina, India, Mexico, and Indonesia account for 77.4% of global corn production. Overall, its global consumption will grow by an average of 1.1% per year, driven by feed demand (FAOStat, 2021; Spriazhka *et al.*, 2024). In Ukraine, the area on which corn is grown is (on average over the past five years) 4.824 million ha with a yield of 6.98 t/ha.

According to R. Kumar & A. Gupta (2020), to meet the basic nutritional needs of the world's growing population, there is a need to increase agricultural production. The quality of seeds increases the yield by at least 10-15%. As noted by M. Pikovskyi & M. Solomiichuk (2022), infection-free seeds are one of the factors that ensure crop growth, but its infection with micromycetes leads to a decrease in sowing qualities, causing loss of germination, rotting and death of seedlings, and the manifestation of diseases on young plants.

Corn seeds can be infected with various micromycetes. Based on the findings of B. Sreenu *et al.* (2019), external pathogens that are transmitted with seeds (*Aspergillus flavus*, *A. niger*, *Fusarium moniliforme*, *Alternaria alternata* and *Curvularia lunata*) and internal ones, which are represented by micromycetes *Bipolaris maydis* and *Colletotrichum*

graminicola, were identified. The researchers also noted the need for differentiated use of seed testing methods. F.H. Gomaa (2021) found that corn seeds were infected with many phytopathogenic microorganisms, including *Fusarium, Aspergillus, Penicillium sp.*, *Nigrospora,* and *Macrophomina*.

In general, phytopathogenic fungi cause a decrease in its sowing qualities of seeds. Along with this, A.M. Gasperini *et al.* (2021) noted that contamination of corn cobs and grains with micromycetes can cause the accumulation of mycotoxins, which negatively affect the health of humans and animals that consume contaminated food. For example, fungi of the genus Fusarium can cause the production of fumonisins or trichothecenes of type B in grain, Aspergillus section Circumdati and *Penicillium verrucosum* species can produce ochratoxins, and the Aspergillus section Flavi group contaminates corn grain with aflatoxins. The problem of contamination with mycotoxins, which accumulate fungi from the genus Fusarium, is also emphasised in the study by O.V. Kaminska *et al.* (2021), which investigated the seasonal dynamics of mycotoxin synthesis in corn grain in Ukraine. All of the above studies indicate the diversity of the species composition of pathogens of fungal diseases of corn seeds, their negative impact on yield, human and animal health. Therefore, there is a need to investigate various aspects of seed pathologies. The purpose of the study was to investigate the symptoms of corn grain mycoses and the spread of micromycetes.

Materials and Methods

The study of the symptoms of corn cob and grain diseases was carried out in the Problem Research Laboratory of Mycology and Phytopathology of the Department of Phytopathology of the National University of Life and Environmental Sciences of Ukraine. The study was in line with the ethical standards set out in the Convention on Biological Diversity (1992) and the Convention on the Trade in Endangered Species of Wild Fauna and Flora (1973). Samples of plant material (cobs) for diagnostics were taken during route surveys during 2019-2021 in the conditions of the Forest-Steppe of Ukraine and during the period of their storage. Every year, seed samples (20 pcs.) were selected after harvesting. During field observations, symptoms of fungal damage to cobs with *Fusarium* spp.*, Alternaria* spp.*, Cladosporium* spp.*, Penicillium* spp. and *Trichothecium roseum* Link ex Friet Fries were revealed.

To investigate the symptoms of diseases, corn seeds were sprouted on potato-glucose agar and in wet chambers according to methods provided by E.J. Warham *et al.* (1996). Diagnosis of diseases was carried out by visual method and microscopic analysis of pathogens (Warham *et al*., 1996; Pikovsky *et al*., 2023), using various optical systems (magnifying glass, binocular stereomicroscope and optical microscope). Temporary microscopic preparations were made to identify micromycetes. Based on the morphology of mycelial hyphae, conidiophores and conidia, pathogens were identified and described in the reference literature (Warham *et al*., 1996; Watanabe, 2002; Leslie & Summerell, 2006). The frequency of occurrence of micromycetes was determined during grain germination in petri dishes on filter paper and calculated by the equation:

$$\text{Fo} = \frac{n \times 100}{N}, \quad (1)$$

where Fo – frequency of occurrence, %; *n* – number of seeds in which this type of micromycete is detected, pcs.; *N* – total number of seeds studied, pcs. Statistical processing of research results was performed using Microsoft Office® for Microsoft Windows.

Results and Discussion

During the studies, infection of corn cobs and grains with various micromycetes was detected (Table 1), which caused the variability of symptoms of diseases. Seed germination helped to establish diagnostic signs of pathologies on seedlings and identify latent infection. In the field, the cobs were affected by Fusarium pathogens (*Fusarium* spp.) and mould (*Alternaria* spp., *Cladosporium* spp., *Penicillium* spp. *Trichothecium roseum* Link ex

Friet Fries.). During the storage period, the development of micromycetes *Botrytis cinerea* Pers. and *Bipolaris* spp. on maize cobs was found. During seed incubation in wet chambers, its mycobiome was represented by fungi of the genera *Trichothecium* Link, *Fusarium* Link, *Alternaria* Nees, *Cladosporium* Link, *Aspergillus* P. Micheli ex Link, *Mucor* Fresen., *Penicillium* Link and *Rhizopus* Ehrenb.

Fusarium infection occurred in the field and during seed germination (Fig. 1). In the pre-harvest period, a web-like or denser pale pink coating appeared on the affected cobs in foci. Grains placed in the lesion visually lost their lustre and acquired a dirty brown hue. During germination, corn grains affected by Fusarium fungi lost their germination or formed weak sprouts that usually died. Under wet conditions, mycelium and pathogen sporulation organs formed on the seed surface. In some cases, grains affected by fusarium pathogens also showed a coexistence of various micromycetes, which increases the harmfulness of the disease.

Table 1. *Visual symptoms, damage to corn cobs and seeds by micromycetes*

Micromycete	Symptoms of pathologies	
	on the cobs	on seeds during germination
Fusarium spp.	under the leaves there are one or more foci of web-like, pale pink, light or bright pink plaque colour; the grains lose their lustre, are covered with mycelium to varying degrees	highly infected seeds are covered with fluffy mycelium and sporulation of the pathogen, do not germinate; weakly affected seeds have a slow germination energy, form weak seedlings, underdeveloped roots, which are gradually colonised by the pathogen, covered with plaque and rot
Penicillium spp.	green mycelium is formed between the rows of seeds in the cob, which covers the surface of the seeds to varying degrees	heavily affected grains become mouldy and do not form seedlings, they are completely covered with a well-developed coating, which is light at first and later becomes green; the coating can form in different parts of the seed, seedlings and roots are underdeveloped, deformed, stunted, and eventually die
Alternaria spp., *Cladosporium* spp.	dark coating forms on the seeds of the cob	on the skin of seeds, a dark coating is formed with sporulation of pathogens; surface infection dominates – normal seedlings and roots are formed; due to a joint infection with fungi of the genus *Fusarium* seedlings die
Aspergillus spp.	no results were found on cobs in the field during the research period	on the surface of seeds, in the form of small heads, sporulation of pathogens of various shades (light yellow-green, dark yellow-green, olive-brown, brown, brown-black, black) is formed; infected seeds lose their germination, or form weak seedlings and roots, which eventually die
Botrytis cinerea	it was not detected in the field; during storage of cobs, a grey coating forms between the rows of grains and on their surface; infected seeds lose their lustre	seeds are covered with a grey, ashy coating and turn mouldy; weakly affected grains form seedlings that rot over time
Bipolaris spp.	it was not detected in the field; during storage of cobs, a light, and later darkish coating is formed between the rows of grains and on their surface	infected seeds lose their germination and become covered with a light grey, fluffy mycelium, which darkens over time
Trichothecium roseum	develops intensively on the grains of the cob powdery pink coating	infected grains become covered with a powdery pink coating and become mouldy
Mucor spp.	no results were found on cobs in the field during the research period	web-like coating forms on the surface of the seed, among which individual dark heads (sporangia) are clearly visible
Rhizopus spp.	no results were found on cobs in the field during the research period	abundant loose grey mycelium and rounded black sporangia form on the surface of the grains

Source: developed by the authors

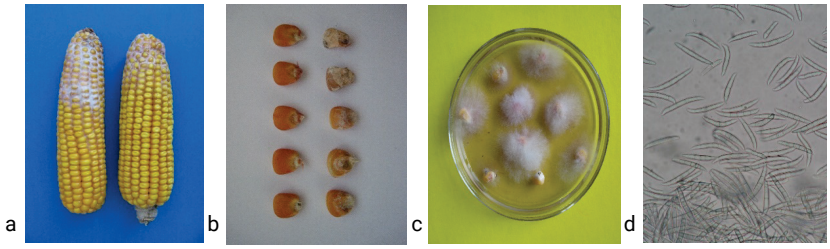

Figure 1. *Symptoms of Fusarium infection on corn (a, b, c) and macroconidia of Fusarium spp. (d)*
Source: compiled by the authors based on own research

In conditions of high humidity and late harvesting, fungi of the genus *Penicillium* developed on the cobs in the form of a mouldy coating of green-bluish hue between the rows of grains and on their surface (Fig. 2a, b, c). Highly infected grain lost its sowing qualities. During germination of corn seeds infected with *Aspergillus* spp. (Fig. 2d), small powdery heads (of various shades) formed on its surface. Intensive development of the pathogen led to a decrease in seed germination, death of seedlings, and weakening of plant seedlings. Pathology often developed on grains with mechanical damage. Damage to corn cobs by micromycetes of genera *Alternaria* Nees and *Cladosporium* Link was observed during crop maturation. Symptoms of pathology were noticeable on the top of the cobs. A black or dark olive coating of varying intensity was formed on the seed shell (Fig. 3). Injured and damaged grains were susceptible to infection. There are also cases of joint development of *Alternaria* spp., *Cladosporium* spp. with fungi of the genus Fusaruim, which led to a loss of seed germination. As a rule, in apparently healthy, full grain, the micromycetes *Alternaria spp.* and *Cladosporium* were present as a surface infection.

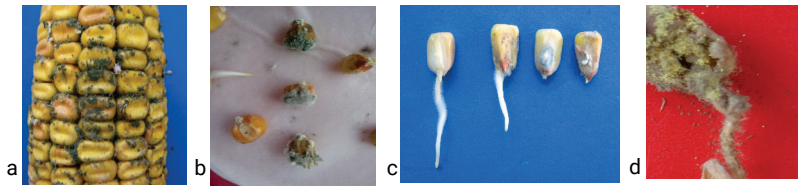

Figure 2. *Penicilliosis and corn aspergillosis*
Note: a – cob affected with Penicilium spp.; b, c – manifestation of penicilliosis during seed germination; d – symptoms of aspergillosis
Source: compiled by the authors based on own research

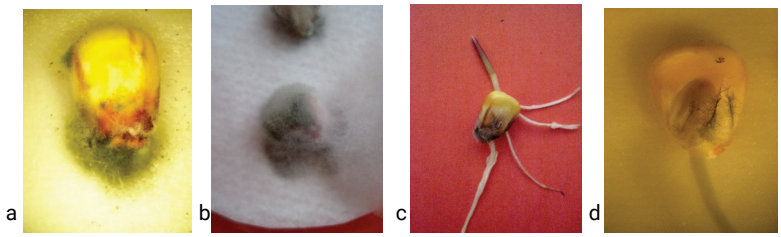

Figure 3. *Manifestation of fungal infection during corn seed germination*
Note: a, b – *Alternaria* spp. and *Fusarium* spp.; c – *Alternaria* spp. and *Cladosporium* spp.; d – *Cladosporium* spp.
Source: compiled by the authors based on own research

During field monitoring of mycoses of corn cobs, their fungal damage with *Botrytis cinerea* was not observed. The pathogen developed in the post-harvest period. Symptoms of grey rot were characterised by the formation of grey plaque between the rows of grains. As the disease progressed, the micromycete affected the grains, which acquired a lighter shade and were covered with plaque, which consists of the organs of sporulation of the pathogen (Fig. 4a, b). During the germination of diseased seeds, moulding occurred. Seedlings were not formed. In addition, during the storage of corn cobs, their damage with *Bipolaris* spp. was detected (Fig. 4c, d). Parasitisation of fungi *B. cinerea* and *Bipolaris* spp. on the corn cobs was not disclosed in the domestic scientific literature.

Fungus *T. roseum*, infecting corn seeds, caused a thick powdery pink coating to appear on their surface (Fig. 5a, b). During seed germination, its moulding was observed. Heavily contaminated grain lost its germination. Corn mould caused by micromycetes *Mucor* spp. and *Rhizopus* spp. was observed during seed germination. In particular, under *Mucor* spp. parasitism, a web-like plaque with dark sporangia formed on the seed surface (Fig. 5c). The fungus developed intensively on a weak grain with damaged skin. Fungus *Rhizopus* spp. formed sporangia singly or in groups on corn seeds under moist conditions (Fig. 5d). Strong colonisation led to seed mould during germination. Grains with damaged seed skins were more likely to develop the pathogen.

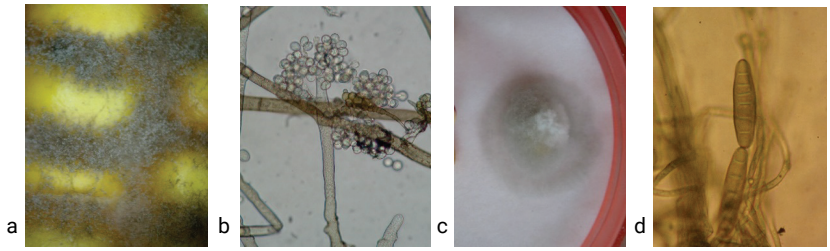

Figure 4. *Symptoms of grey mold on the cob of corn (a) and conidial sporulation of the fungus B. cinerea (b); the seed is affected by the fungus Bipolaris spp.(c) and pathogen conidia (d)*
Source: compiled by the authors based on own research

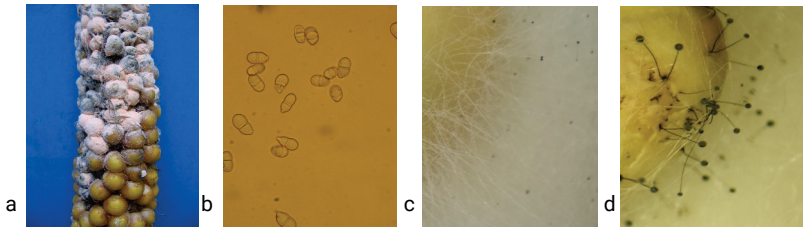

Figure 5. *Mould symptoms*
Note: a – pink mould on the cob of corn; b – conidia of the fungus *T. roseum*; c – fungal sporulation of *Mucor* spp.; d – *Rhizopus* spp.
Source: compiled by the authors based on own research

Phytopathological examination of corn seeds performed using a biological method showed its contamination with fungi belonging to 8 genera: *Trichothecium*, *Fusarium*, *Alternaria*, *Cladosporium*, *Aspergillus*, *Mucor*, *Penicillium* and *Rhizopus* (Fig. 6). The highest frequency of occurrence was characterised by representatives of the genus *Alternaria* – 18.4%. Fungi of genera *Cladosporium* and *Penicillium* were detected on 4.5 and 4.7%, respectively. Seed infection with *Fusarium* spp. was 2.7%, while

Mucor spp. – 2.6%. Representatives of the genus *Rhizopus* were identified on 1.1% of seeds. Fungi of genera *Trichothecium* and *Aspergillus* were 0.4 and 0.6%. The proportion of micromycetes in the pathogenic complex was as follows: *Alternaria* – 52.4%, *Penicillium* – 13.4%, *Cladosporium* – 12.8%, *Fusarium* – 7.7%, *Mucor* – 7.4%, *Rhizopus* – 3.2%, *Aspergillus* – 1.7%, *Trichothecium* – 1.4%.

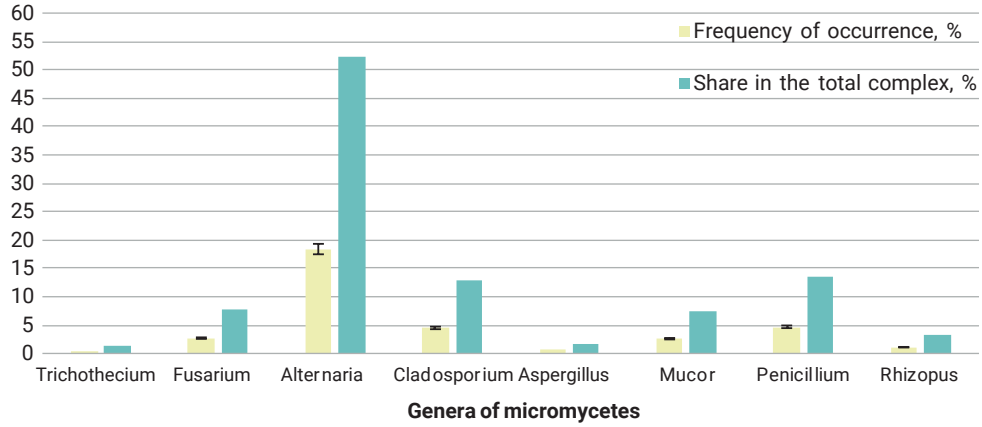

Figure 4. *Mycobiota of corn seeds (average for 2019-2021)*
Source: compiled by the authors based on own research

According to the analysis of results, seed micromycetes are characterised by significant species diversity in different regions of experiments. In the study by I. Niaz & S. Dawar (2009), corn seed mycoflora was represented by the following species: *Aspergillus flavus*, *A. goesii*, *A. niger*, *Penicillium* spp., *Drechslera* spp., *Cladosporium* spp., *Fusarium* spp., *Curvularia* spp., *Rhizopus* spp., *Arthrinium phaeospermum*, *Aspergillus foetidus*, *A. tubingensis*, *Curvularia clavata*, *C. pallescens*, *C. intermedia*, *Bipolaris maydis*, *Drechslera carbonum*, *Diplodia zea*, *Fusarium crockwellense*, *F. cladosporium*, *F. graminearum*, *F. culmorum*, *F. proliferatum*, *F. nivale*, *Penicillium citrinum*, *P. funiculosum*, *Phoma herbarum*, *Rhizoctonia solani*, *R. oligosporum*, *Syncephalastrum racemosum* and *Trichoderma harzianum*. The researchers also noted that similar types of fungi have been found on corn seeds from different countries around the world, such as the United States, Thailand, India, Canada, Australia, France, Nepal, the United Kingdom, Romania, and Hungary.

M.M. Akonda *et al.* (2016) established infection of corn seeds with nine types of fungi: *Aspergillus flavus* – 27.42%, *A. niger* – 23.47%, *Fusarium oxysporum* – 20.55%, *F. moniliforme* – 17.39%, *Penicillium oxalicum* – 18.37%, *Rhizopus stolonifer* – 17.83%, *Curvularia lunata* – 7.87%, *Bipolaris maydis* – 3.50%, and *Alternaria alternata* – 274%. According to O.T. Kutsan *et al.* (2021), when analysing corn seed samples taken from farms in Eastern Ukraine, the greatest contamination with micromycetes (from 42 to 74%) was inherent in *Fusarium*, *Aspergillus*, *Penicillium* and from 9 to 29% for *Rhizopus*, *Mucor* and *Alternaria* (2015 harvest). While in the seed samples of the 2020 harvest, the total contamination with grain micromycetes increased to 89% and their ratio to each other changed. M.V. Bogach *et al.* (2024) identified a mycobiota of corn grain in the North-Western Black Sea region of Ukraine during periods of severe drought, which was represented by fungi from genera *Penicillium* (81%), *Aspergillus* (78%), *Fusarium* (42%), *Alternaria* (31%), *Mucor* (16%), and *Rhizopus* (5%). Whereas in growing seasons with sufficient moisture, the spread of micromycetes of genera *Penicillium* and *Aspergillus* decreased by 17% and 14 %, respectively, and fungi of the genus *Fusarium* increased by 9%.

Y.M. Shabana *et al.* (2023), studying the distribution and biodiversity of seed pathogenic and toxigenic corn fungi in Egypt and their correlation with weather factors, identified mycobiome and the most common species: *Ustilago maydis*, *Alternaria alternata*, *Aspergillus flavus*, *Aspergillus niger*, *Penicillium* spp., *Cladosporium* spp., and *Fusarium verticillioides*. Moreover, relative humidity, temperature and wind speed, respectively, had the greatest impact on the spread of pathogens. According to I.H. Al-Masoodi *et al.* (2023), corn seed analysis revealed *Aspergillus* spp., *Penicillium* spp., *Fusarium* spp., *Mucor* spp., *Alternaria* spp., *Acremonium* spp. and yeast. Among the fungi of the genus Fusarium, the following species were identified: *F. verticillioides*, *F. equiseti*, *F. proliferatum*, *F. sulawenes, F. oxysporium* and *F. thapsinum*. W.M. Haggag *et al.* (2024), using molecular identification, identified the most common fungi in corn seeds that were represented by species *Fusarium verticillioides*, *Talaromyces verruculosus*, *Aspergillus niger*, *A. flavus* and *A. terreus*.

New pathogens of corn cobs and grains have been detected in different countries. Thus, A. Pfordt *et al.* (2020) in 2018 observed an intense infection of cobs with the fungus genus Trichoderma in in Germany. In further research, it was identified as *Trichoderma afroharzianum*. The researchers proposed the name of the disease – trichoderma ear rot. A little later, M. Sanna *et al.* (2022) found infection of corn cobs with the fungus *T. afroharzianum* in Italy, which caused green seed mould. In Hainan province in Southern China, H. Sun *et al.* (2022) were the first to diagnose cob infection with the fungus *Exserohilum rostratum*. The pathogen caused the appearance of dark brown spots, which were covered with a grey-black coating. Severely affected grains had a wrinkled appearance.

Thus, monitoring of fungal pathogens and its phytopathological examination are necessary to assess the quality of corn seeds. Information on the symptoms of mycoses, the species composition of micromycetes should be used in the diagnosis of seed pathologies.

Conclusions

During the study of diseases of corn cobs in the field, their damage by fungi – pathogens of Fusarium was diagnosed (*Fusarium* spp.) and mold (*Penicillium* spp., *T.roseum*, *Alternaria* spp., *Cladosporium* spp.). In the post-harvest period, parasitisation on the heads of micromycetes *B. cinerea* and *Bipolaris* spp. was identified. The variability of symptoms of pathologies characterised by the formation of plaque of various colours, deterioration or loss of the ability of seeds to germinate, and rotting of seedlings was established. Seeds heavily infected with *Fusarium* spp. did not germinate, while weakly affected, formed weak seedlings, underdeveloped roots. *Penicillium* spp. caused seed mould, deformation of seedlings and roots, and their growth lag. Seeds infected by *T. roseum* were covered with a powdery pink coating and mould. Micromycetes *Alternaria* spp. and *Cladosporium* spp. were often in the form of a superficial infection and in most cases did not reduce seed germination rates. *Aspergillus* spp., *Mucor* spp. and *Rhizopus* spp. caused moulding of highly infected seeds, and also made up its epiphytic mycoflora. Fungi *B. cinerea* and *Bipolaris* spp., in the case of infection of corn cobs, led to a loss of germination of corn seeds.

Mycobiom of corn seeds was represented by *Fusarium* spp. *Penicillium* spp., *Aspergillus* spp., *Mucor* spp., *Rhizopus* spp., *T. roseum, Alternaria* spp., *Cladosporium* spp. Phytopathological examination of corn seeds has shown that the highest frequency of occurrence was characterised by representatives of the genus *Alternaria* – 18.4%. Fungi of genera *Cladosporium* and *Penicillium* were detected on 4.5 and 4.7% of the tested seeds, respectively. Seed infestation with *Fusarium* spp. was 2.7%, *Mucor* spp. – 2.6%. Frequency of occurrence of micromycetes of genera *Rhizopus, Aspergillus* and *Trichothecium* was 1.1%, 0.6%, and 0.4%, respectively. Further research should focus on identifying the species composition of pathogens, determining the content of mycotoxins in grain, and the influence of environmental factors on these processes.

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None.

Conflict of Interest

None.

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Грибні хвороби насіння кукурудзи

Мирослав Піковський
Доктор сільськогосподарських наук, професор
Національний університет біоресурсів і природокористування України
03041, вул. Героїв Оборони, 15, м. Київ, Україна
https://orcid.org/0000-0003-0689-604X
Володимир Дудченко
Доктор економічних наук, професор
Херсонський державний аграрно-економічний університет
73006, вул. Стрітенська, 23, м. Херсон, Україна
https://orcid.org/0000-0001-8545-7904
Вікторія Мельник
Кандидат сільськогосподарських наук, доцент
Національний університет біоресурсів і природокористування України
03041, вул. Героїв Оборони, 15, м. Київ, Україна
https://orcid.org/0000-0002-8782-1236

Анотація. Кукурудза є стратегічною культурою, попит на яку зростає, що зумовлює необхідність збільшення виробництва та використання здорового насіння для підвищення врожайності й якості продукції. Метою роботи було дослідити симптоматику грибних хвороб насіння кукурудзи та встановити поширення мікроміцетів. Вивчення хвороб качанів і насіння кукурудзи здійснювали у проблемній науково-дослідній лабораторії Мікології і фітопатології кафедри фітопатології Національного університету біоресурсів і природокористування України. Зразки рослинного матеріалу (качанів) для діагностики відбирали під час маршрутних обстежень в умовах Лісостепу України та під час періоду їх зберігання. Проби насіння були відібрані після збирання врожаю. Діагностику хвороб здійснювали шляхом візуального огляду і біологічним методом (пророщування насіння у вологих камерах та на поживному середовищі). Для ідентифікації мікроміцетів проводили мікроскопічний аналіз їх морфологічних структур. Частоту трапляння мікроміцетів встановлювали під час пророщування насіння у чашках Петрі на фільтрувальному папері. Під час досліджень виявлено інфікування качанів і зерна кукурудзи різними мікроміцетами (*Trichothecium* spp., *Fusarium* spp., *Alternaria* spp., *Cladosporium* spp., *Aspergillus* spp., *Mucor* spp., *Penicillium* spp., *Rhizopus* spp.), що зумовлювали мінливість симптомів хвороб. Встановлено паразитування на качанах кукурудзи грибів *Botrytis cinerea* та *Bipolaris* spp., яке у вітчизняній науковій літературі не розкрито. Найвищою частотою трапляння на насінні кукурудзи характеризувалися представники роду *Alternaria* – 18,4 %. Гриби родів *Cladosporium* та *Penicillium* виявлялися відповідно на 4,5 та 4,7 % насінин. Інфікованість насіння *Fusarium* spp. становила 2,7 %, *Mucor* spp. – 2,6 %. Представників роду *Rhizopus* ідентифіковано на 1,1 % насінин. Гриби родів *Trichothecium* та *Aspergillus* становили 0,4 та 0,6 %. Тому, моніторинг збудників грибних хвороб та його фітопатологічна експертиза є необхідними для оцінки якості насіння кукурудзи. Інформацію щодо симптоматики мікозів, видового складу мікроміцетів слід використовувати під час діагностики патологій насіння

Ключові слова: діагностичні ознаки; пліснявіння; фузаріоз; мікроміцети; зерно; проростання