

PATHOGENICITY OF *FUSARIUM* SPP. TO SELECTED TURFGRASS SPECIES



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Diseases caused by fungi are one of the factors reducing the quality of lawns. *Fusarium* spp. are important pathogens damaging turfgrasses, which are often carried with the sowing material. The aim of the study was to determine the harmfulness of three species of the genus *Fusarium* in relation to eight cultivars of grasses.

MATERIAL AND METHODS

In the first stage of the research, a mycological analysis of grass kernels was carried out. This studies were conducted on the sowing material of eight turfgrass cultivars belonging to four species: *Festuca rubra* L. – cv. Adio, cv. Nil and cv. Nimba, *Festuca ovina* L. cv. Noni, *Lolium perenne* L. – cv. Info, cv. Inka and cv. Pincia, *Poa pratensis* L. – cv. Alicja. 100 kernels randomly chosen from 40 g samples were analyzed for each cultivar. The plate method was applied to isolate the fungi colonizing the seeds.

The studies on the harmfulness of three *Fusarium* species (*F. avenaceum* No 70, *F. crookwellense* No 74 and *F. sporotrichioides* No 24) in relation to seedlings of eight grass cultivars were carried out in a growth chamber, at the temperature of 22–23°C and with relative humidity of the air of 85%. In the experiment were used plastic pots with the diameter of 10 cm filled with the universal subsoil with sand in the proportion 2:1, with pH 6.5, previously sterilized in an autoclave for two hours at the temperature 121°C, under the pressure of 0.12 MPa. Seed material of the analyzed grass cultivars whose sprouts reached the length of 10 mm and were normally formed were used for the studies. Seed material of the analyzed grass cultivars whose sprouts reached the length of 10 mm and were normally formed were used for the studies. The selected material was placed on plasters of the medium with the analyzed strain of each fungi species, and next it was covered with the medium according to Mańka [1989]. The control were the pots where slightly germinated seeds were placed on medium plasters without the fungus. The plants grew for 25 days, after which the numbers of healthy, infected plants and those that died out before emergence were established. The infection degree of plants with disease symptoms was determined according to a 4°scale. Disease indexes were calculated using the formula of McKinney. The obtained results were statistically analyzed using T-Tukey's confidence semi-intervals [Mielniczuk 2018].

RESULTS

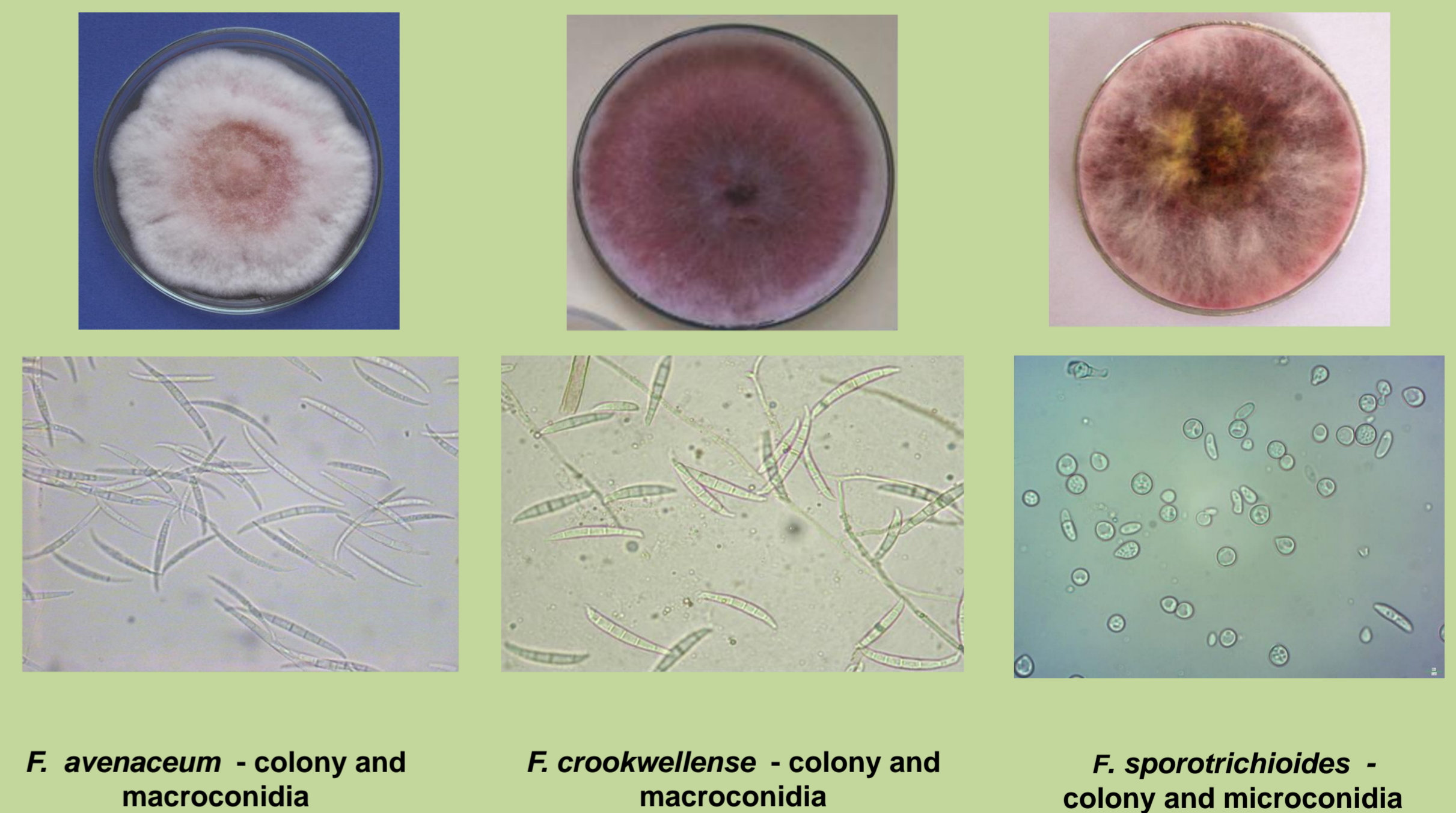
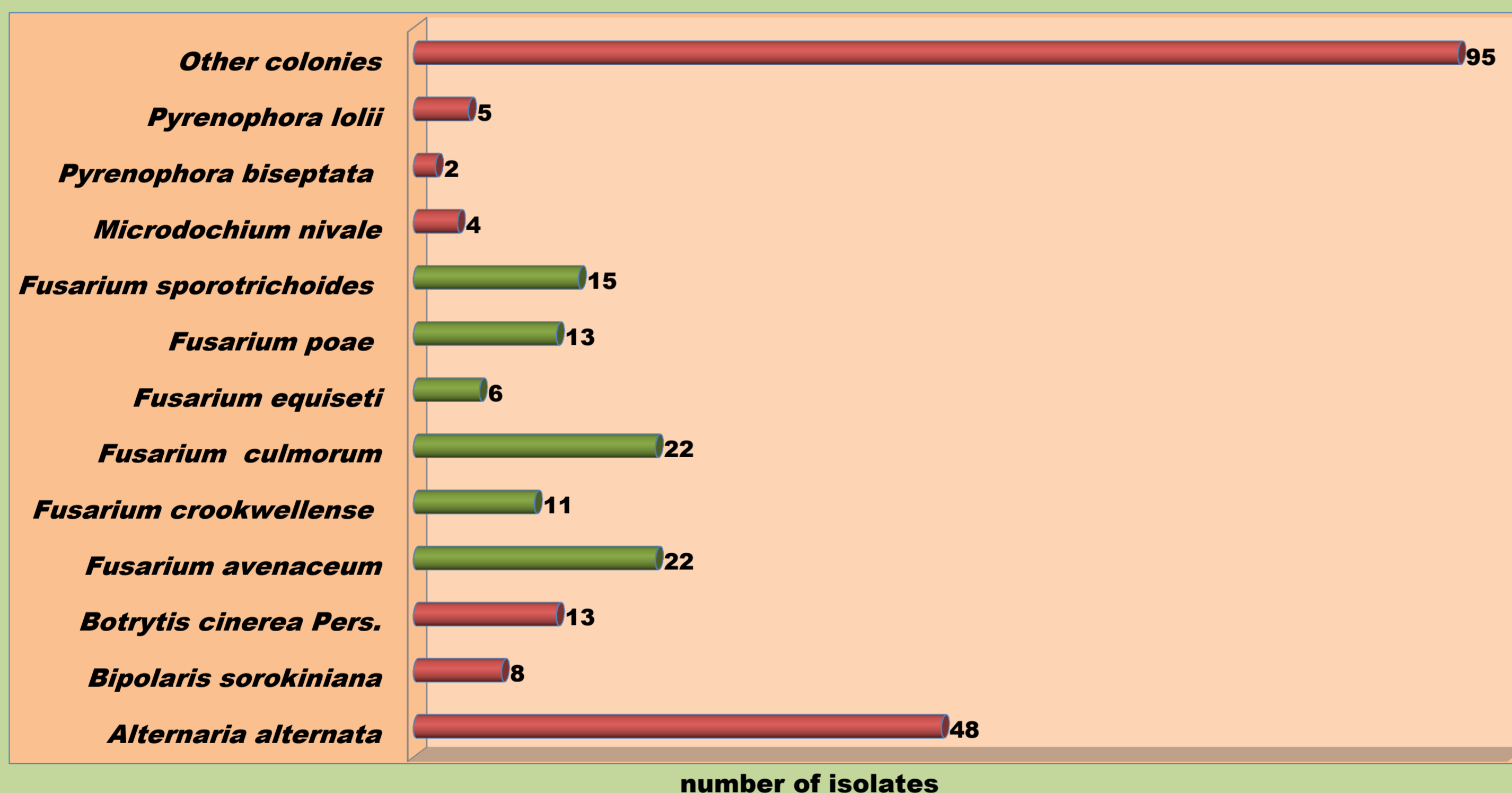
Fungi isolates belonging to 24 species were obtained as a result of the mycological analysis of turfgrass kernels. Among pathogenic fungi, the following species were obtained: *Fusarium avenaceum*, *F. culmorum*, *F. crookwellense*, *F. equiseti*, *F. poae*, *F. sporotrichioides*, *Microdochium nivale*, *Botrytis cinerea*, *Bipolaris sorokiniana*, *Pyrenophora biseptata*, *Pyrenophora lolii*. The other fungi species colonizing the sowing material were represented by the following: *Acremonia atra*, *Alternaria alternata*, *Aspergillus flavus*, *Aspergillus niger*, *Chaetomium globosum*, *Cladosporium cladosporioides*, *Mucor hiemalis*, *Papularia sphaerosperma*, *Penicillium aurantiogriseum*, *Penicillium chrysogenum*, *Rhizoctonia solani*, *Stemphylium botryosum* as well as non-sporulating forms.

Results obtained from experiment confirmed considerable harmfulness of *Fusarium* spp. towards the seedlings of turfgrasses, which can be reduced introducing less susceptible varieties to the cultivation. The species *F. crookwellense* was the most harmfulness to the analyzed grass cultivars.

The statistical analysis of disease indexes for plants obtained from the experimental combination with artificial infection of the subsoil with above mentioned strains as compared to the control indicated significant differences in all studied cultivars and in the case of all analyzed *Fusarium* strains.

Significantly, the lowest value of the disease index of cultivar Pincia (*Lolium perenne* L.) allows to accept that cultivar as the least susceptible to infestation by *Fusarium* spp. under conditions of controlled temperature and humidity.

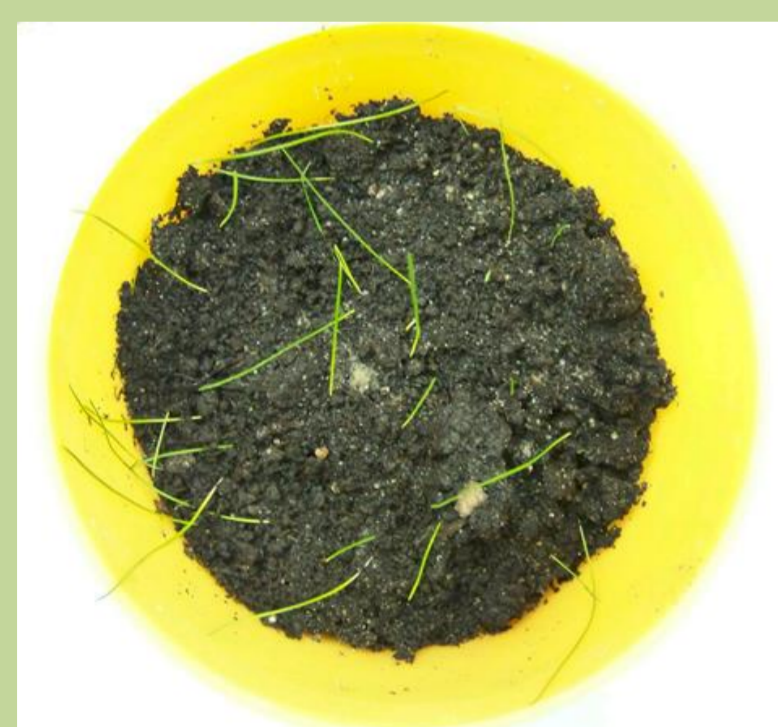
Fungi isolated from turfgrass cultivars



Mean values of the disease index for seedlings of analysed turfgrass cultivars obtained in growth chamber conditions with artificial infection of subsoil with *F. avenaceum*, *F. crookwellense* and *F. sporotrichioides*

Species and cultivars	<i>F. avenaceum</i>	<i>F. crookwellense</i>	<i>F. sporotrichioides</i>	Control
Red Fescue - <i>Festuca rubra</i> L.				
Adio	70,50c	75,00c	84,75e	9,75
Nil	56,25b	89,00e	60,75cd	8,75
Nimba	71,00c	82,75d	91,25f	8,50
Sheep's Fescue - <i>Festuca ovina</i> L.				
Noni	95,50d	98,25f	93,75f	10,25
Perennial Ryegrass - <i>Lolium perenne</i> L.				
Info	43,75a	57,00b	56,25c	11,00
Inka	50,25ab	78,00cd	46,25b	6,00
Pincia	49,50ab	44,25a	36,25a	6,75
Smooth - stalked Meadowgrass - <i>Poa pratensis</i> L.				
Alicja	53,75b	94,25e	63,00d	10,75
Means	61,31	77,31	66,53	9,00

Values in the columns with the same lower case do not differ significantly with P ≤ 0,05



Grass seedlings with disease symptoms after inoculation with *Fusarium* spp.