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FUNGI OCCURRING ON TURFGRASSES IN POZNAŃ

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Abstract

Fungi occurrence on turfgrasses was evaluated in 2002–2006. The assessment was done at one month intervals on three lawns in Poznań, located at a distance of 2–4 km one from another. On leaves with brown spots following fungi were found: *Colletotrichum graminicola* (on five turfgrass species), *Drechslera dictyoides* f. sp. *dictyoides* (on six species), *D. poae* (on two species), *D. siccans* (on one species) and *Pyricularia grisea* (on five species). Following obligate parasites were noted: *Blumeria graminis* (on nine species), *Puccinia coronata* (on three species) and *P. striiformis* (on two species). Other three species occurred on single plants: *P. recondita* f. sp. *bromina* (on *Bromus sterilis*), *Uromyces festucae* and *Urocystis macrospora* (on *Festuca rubra*). *Colletotrichum graminicola*, *D. dictyoides* f. sp. *dictyoides* and *B. graminis* occurred most frequently on *Poa pratensis* whereas *P. grisea* on *F. rubra*.

Key words: grasses, *Drechslera* leaf spot, anthracnose, powdery mildew, rusts, smuts

Introduction

The turfgrasses are of great importance in green areas. The fungi occurring on the plants deteriorate they aesthetic look or sometimes can cause plants death. Fungi may infect above- and underground parts of plants. Brown spots (uniformly coloured or bicolour), white powder (powdery mildew), brown dust (rusts) or black dust (smuts) occur on the aboveground parts of grasses (Smiley et al. 1992). In Poland extensive studies on fungi occurring on turfgrasses were performed in Plant Breeding and Acclimatization Institute in Radzików (Prończuk 1995, 2000, Czembor 2002). There are almost no works on fungal diseases occurring on turfgrasses in cities of Poland.

The aim of the work was evaluation of fungi occurrence on aboveground parts of turfgrasses in Poznań.

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Material and methods

The occurrence of fungi was investigated in 2002–2006 on three lawns in Poznań, located at a distance of 2 to 4 km one from another. The lawns were mowed every two weeks, and irrigated in periods of drought. The assessments were done during the whole vegetation season from March to October at one month intervals (in the last decade of successive months). 25 plants were taken from four places in each lawn in all terms. In laboratory species of particular plants were identified (Czarnocki 1950, Kozłowski et al. 1998) and diagnosis of diseases occurring on the plants followed, according to Chidambaram et al. (1973), Chochriakow et al. (1973), Kochman and Majewski (1973), Majewski (1979), Ellis and Ellis (1985), Sivanesan (1987), Landschoot and Hoyland (1992) and Prończuk (1995). Microscope observations of all infected parts of plants were done to identify the occurring fungi.

A lot of vegetation season parts in the five successive years were characterized by long periods without precipitation and mean monthly temperature higher than long-period average.

Results

Poa pratensis, *Lolium perenne*, *Festuca capillata* and *P. compressa* were the species occurring most frequently in the lawns (Table 1). Sporadically occurred *Bromus sterilis*, *Alopecurus myosuroides* and *F. duriuscula*.

On uniformly coloured brown spots on plants sporulation of *Colletotrichum graminicola*, *Drechslera dictyoides* f. sp. *dictyoides* and *Pyricularia grisea* prevailed (Table 2). Similar fungi occurred on bicolour brown spots on which only *D. siccans* was not observed (Table 3). *Blumeria graminis* occurred on nine plant species, but most often on *P. pratensis* and *L. perenne* (Table 4). The remaining species of fungi occurred on less numerous host species (*Puccinia coronata* on three turfgrass species, *P. striiformis* on two, and *P. recondita* f. sp. *bromina*, *Uromyces festucae* as well as *Urocystis macrospora* only on single plant species).

Discussion

The occurrence of *C. graminicola*, *D. poae*, *D. dictyoides* f. sp. *dictyoides*, *D. siccans*, *P. grisea*, *B. graminis*, *P. coronata*, *P. striiformis*, *P. recondita* f. sp. *bromina* and *U. festucae* on turfgrasses in Poland was already noted (Kućmierz et al. 1992, Prończuk 1995, 1996, Czembor 2002, Weber 2004). *Colletotrichum graminicola* is known to infect many turfgrasses (Horvath and Vargas 2004). It was similar in our work, yet *P. pratensis* was the predominating host of the pathogen. From among the fungal species *P. grisea* was found a very severe pathogen of *L. perenne* by high air temperature

Table 1

The occurrence of turfgrass species in the observed lawns (mean for 2002–2006)

Species	Share (%)
Festuca rubra	8.3
Festuca pratensis	5.4
Festuca capillata	10.0
Festuca ovina	6.6
Festuca heterophylla	2.6
Festuca duriuscula	0.8
Agrostis vulgaris	5.2
Bromus mollis	1.0
Bromus sterilis	0.1
Poa pratensis	20.9
Poa annua	6.0
Poa compressa	9.5
Poa trivialis	5.6
Alopecurus pratensis	2.1
Alopecurus myosuroides	0.3
Lolium perenne	15.6

and high humidity (Farman 2002). In our work by high air humidity and moderate temperature the pathogen was only found on *F. rubra*, *P. pratensis*, *P. compressa* and *F. heterophylla*. From among three species of the *Drechslera* genus the most often occurring one was *D. dictyoides* f. sp. *dictyoides* on *P. pratensis*. *Puccinia striiformis* oc-

Table 2

The occurrence of fungi on turfgrass leaves with uniformly coloured brown spots (2002–2006)

Species of turfgrasses	Species of fungi				
	I	II	III	IV	V
Festuca rubra	+	+	–	–	+ + +
Festuca pratensis	+	–	–	–	–
Festuca heterophylla	–	–	–	–	+
Poa pratensis	+ + + +	+ + +	–	+	+ +
Poa compressa	+	+	+	–	+ +
Poa trivialis	–	+	–	–	–
Alopecurus pratensis	–	+	–	–	–
Lolium perenne	+	–	–	–	–

I – *Colletotrichum graminicola*, II – *Drechslera dictyoides* f. sp. *dictyoides*, III – *D. poae*, IV – *D. siccans*, V – *Pyricularia grisea*.

"+" – species noted in one of five years, "+ +" – species noted in two of five years, "+ + +" – species noted in three of five years, "+ + + +" – species noted in four of five years, "–" – occurrence not noted.

Table 3

The occurrence of fungi on turfgrass leaves with bicolour brown spots (2002–2006)

Species of turfgrasses	Species of fungi				
	I	II	III	IV	V
Festuca rubra	–	+	–	–	+
Agrostis vulgaris	–	+	–	–	–
Poa pratensis	+ + +	+ +	+	–	+ +
Poa annua	–	–	–	–	+

Explanations – see Table 2.

Table 4

The occurrence of obligate parasites on turfgrass leaves (2002–2006)

Species of turfgrasses	Species of fungi					
	I	II	III	IV	V	VI
Bromus sterilis	–	–	–	+	–	–
Festuca capillata	+ +	–	–	–	–	–
Festuca heterophylla	+	–	–	–	–	–
Festuca ovina	+	–	–	–	–	–
Festuca pratensis	+	+	–	–	–	–
Festuca rubra	+	–	+	–	+	+
Poa compressa	+	–	–	–	–	–
Poa pratensis	+ + + +	+ +	+ +	–	–	–
Poa trivialis	+ +	+ +	–	–	–	–
Lolium perenne	+ + +	–	–	–	–	–

I – *Blumeria graminis,* II – *Puccinia coronata,* III – *P. striiformis,* IV – *P. recondita* f. sp. *bromina,* V – *Uromyces festucae,* VI – *Urocystis macrospora.*

"+", "+ +", "+ + +", "+ + + +", "–" – see Table 2.

curred most often on *P. pratensis* both in our work and in that of Prończuk and Prończuk (2003) works. *Urocystis macrospora* was observed on *F. rubra* and *F. pratensis* by Kochman and Majewski (1973). In our work the species was found only on one *F. rubra* plant in 2004. The occurrence of particular pathogens depends, among other factors, on the presence of infection sources, susceptibility of host plant and environmental conditions (Pląskowska et al. 2006 a, b). During the five years of research environmental conditions depended on year and observation term in successive years. Our results are similar to those pointing at high susceptibility of *P. pratensis* to various pathogens (Prończuk 1995, 1996, Czembor 2002). Płażek (1994) reports differences in susceptibility of *F. pratensis* and *F. rubra* particular genotypes or other species of turfgrasses to *D. dictyoides*. However, it is difficult to refer to her results as the genotypes of particular turfgrass species in our work are not known. Powdery mildew symptoms occurred usually in spring

(March and April) and autumn (September and October). Fungi sporulation on leaves with brown spots was observed in periods with high relative air humidity which were connected with precipitation, similarly as it was found by Prończuk (2002).

Streszczenie

GRZYBY WYSTĘPUJĄCE NA TRAWACH GAZONOWYCH W POZNANIU

W latach 2002–2006 oceniano występowanie grzybów na porażonych częściach liści traw gazonowych. Obserwacje prowadzono w odstępach miesięcznych na trzech trawnikach w Poznaniu, oddalonych od siebie o 2–4 km. Na liściach z brunatnymi plamami stwierdzono występowanie: *Colletotrichum graminicola* (na pięciu gatunkach traw), *Drechslera dictyoides* f. sp. *dictyoides* (na sześciu gatunkach), *D. poae* (na dwóch gatunkach), *D. siccans* (na jednym gatunku) i *Pyricularia grisea* (na pięciu gatunkach). Spośród pasożytów bezwzględnych występowały: *Blumeria graminis* (na dziewięciu gatunkach), *Puccinia coronata* (na trzech gatunkach) i *P. striiformis* (na dwóch gatunkach). Pozostałe trzy grzyby rdzawnikowe zanotowano tylko na pojedynczych roślinach: *P. recondita* f. sp. *bromina* na *Bromus sterilis*, *Uromyces festucae* i *Urocystis macrospora* na *Festuca rubra*. *Colletotrichum graminicola*, *D. dictyoides* f. sp. *dictyoides* i *B. graminis* najczęściej występowały na *Poa pratensis,* a *P. grisea* na *F. rubra*.

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