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NEW PATHOGENS OF FRUIT PLANT SHOOTS IN POLAND

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Abstract. The studies conducted in the years 2010-2012 showed that among the fungi species inhabiting shoots of fruit plants there were cultures of *Phomopsis* spp. They were isolated mainly from the shoots originated from orchards without chemical protection. Moreover, isolates of *Phomopsis* obtained both from shoots with disease symptoms and from visually healthy ones. The morphological characteristics of isolated strains and their pathogenic abilities as well as genetic similarity suggest that they represent one species of fungus.

Key words: *Phomopsis*, fruit plants, pathogenic fungi

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Introduction

Among the fungi pathogenic to bark and wood of fruit plants, both worldwide and in Poland, the most frequently mentioned are: *Nectria galligena* Bres., *Pezicula* spp., *Valsa* spp., *Leucostoma* spp., *Chondrostereum purpureum* (Pers.) Pouzar and *Botryosphaeria* spp. In the literature there are also a few reports on *Physalospora obtusa* (Schw.) and *Phacidiella discolor* (Mont. et Sacc.) Potebn. Recently, diseases caused by *Phomopsis* spp. have become an increasing problem in the orchard regions of the world (Rehner & Uecker 1994; Smit *et al.* 1996; Uddin *et al.* 1998). These fungi are common in various climatic zones and colonize many plant species. They are associated with bark necrosis, shoots blight and canker, wilting, decay, fruit rot and mummification (Uecker 1988). Because of the lack of information on their occurrence and harmfulness for fruit plants in our country studies were undertaken in orchards of south-eastern Poland.

Material and methods

The studies were conducted in four orchards in Lublin region. In two of them chemical protection was carried out according to recommendations of plant protection. In the other two orchards there was no plant protection applied. One year old shoots of different varieties of apple, pear, cherry and plum trees showing disease symptoms were collected twice during the growing season in May and September. Additionally, samples from healthy shoots were taken for comparative purposes. In the laboratory mycological analysis was performed according to the phytopathological principles.

Obtained *Phomopsis* strains were characterized on the basis of color and appearance of colonies, colony growth rate, sporulation and morphology of alpha conidia. Pathogenicity tests were performed by cross inoculation of apple, pear, cherry and plum shoots with one-spore cultures of *Phomopsis* strains originated from investigated plants species. DNA analysis was carried out using of RAPD technique.

Results

From chemically protected plants *Alternaria alternata* (Fr.) Keissl. and *Fusarium* spp. were isolated most frequently whereas Phomopsis isolates were obtained only occasionally. However, from the plants where was no chemical protection applied cultures of *Phomopsis* were isolated much more. They formed on PDA medium white-gray colonies with brown and

black reverse. Conidiomata producing spores were formed with difficulty therefore the stimulation of sporulation have been required (Król 2005). It was shown that *Phomopsis* isolates have been obtained from all tested fruit plants, both from the shoots with visible disease symptoms as well as from the apparently healthy ones. *Phomopsis* strains showed similarity in appearance and growth rate of cultures regardless of the host plant species. Suitable conditions for mycelial growth was observed in the range from 16°C to 25°C. All tested strains formed alpha (α) and beta (β) conidia with dimensions 6.3-8.6 μm × 1.5-3.2 μm and 19.5-45 μm × 1.2-3.1 μm, respectively. It was also found that the fungal communities colonizing the shoots of fruit plants limited the development of *Phomopsis* spp. as reflected by positive summary biotic effects within three years of study. Results of cross-inoculation tests proved the pathogenic abilities of *Phomopsis* strains towards tested plant species. The analysis of RAPD products indicated the similarity within the studied population of *Phomopsis* regardless of the origin of isolates, suggesting that the tested strains may represent this same species of fungus.

Conclusions

1. Morphological similarity within the genus *Phomopsis* indicates the necessity for combining classical and molecular diagnostic methods to accurately detection and identification of these fungi.

2. The results of pathogenicity tests may be used to determine the range of host plants for investigated *Phomopsis* species.

3. The ability of *Phomopsis* sp. to latent existence in plant tissue poses a risk of their transmission with propagation material.

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