

Analyses of Taxonomy and Distribution of Fungi Species in Woody-Bush Plantations of the Pavlodar Region, Kazakhstan

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Abstract

In this work the results of a taxonomic analysis of the plant pathogenic species of fungi distributed in woody-bush green plantations of the Pavlodar region, Kazakhstan, are presented. The study was carried out in some cities, such as Pavlodar, Aksu and Ekibastuz, between 2002 and 2006, and completed comparative analysis on the degree of plant damage caused by diseases of pathogenic fungi. Totally 60 species pathogenic fungi were revealed from 21 species of trees belonging to 12 genera and 15 species of bushes from 9 genera. Ten species of them recorded as new host plants for fungi in Kazakhstan.

Key words: plant pathogenic fungus, green plantation, Kazakhstan

This research was carried out in the cities as Pavlodar, Aksu and Ekibastuz. Sixty species of pathogenic fungi were revealed from 21 species of trees belonging to 12 genera and 15 species of bushes from 9 genera. Ten species were recorded as a new host plant for fungi in Kazakhstan, namely: *Caragana arborescens*, *Sambucus racemosa*, *Ulmus pinnatoromosa*, *Syringa* sp., *Grossularia* sp., *Viburnum opulus*, *Salix acutifolia*, *Ribes spicatum*, *Elaeagnus angustifolia*, *Fraxinus excelsior*, *Malus domestica*, *Populus nigra*, *Crataegus sanguinea*, *Salix alba*, *Betula pendula*, *Rosa* sp., *Acer negundo* and *Ribes* sp.

Among the collected fungi, five unknown species were found: *Microsphaera* sp. growing on *Populus nigra*, *Vitis* sp. and *Uncinula* sp. on *Ribes nigra*, and *Elaeagnus angustifolia*, and *Gloeosporium* sp. on *Populus alba*. The morphological measurements of these fungi are not available in the identification keys (e.g. Saccardo, 1832-1931), and moreover, none of them were identical with the type specimens kept in the Institute of Botany and Plant Introduction, Ministry of Science, Kazakhstan.

The identified 60 species of fungi belong to six orders, but 36 of them are representatives of only one order, Erysiphales, and these species are spread in seven different orders. Among the genera of the latter order, *Microsphaera* consists of 11 species, *Phyllactinea* – 10 species, *Uncinula* – 6 species, *Podosphaera* and *Leveillula* each have 3 species. The other order, Uredinales is

composed of 13 species belonging to 4 genera, such as *Melampsora* with 6 species, *Phragmidium* (3 spp.), *Perdermim* (3 spp.) and *Gymnoconia* (1 sp.).

A third order, Sphaeropsidales consists of 8 species from 3 genera: *Phyllosticta* (4 spp.), *Cytospora* (3 spp.) and *Cenangium* (1 sp.). Twelve species of fungi are members of the order Melanconiales, and they belong to three genera: *Cylindrosporium* (5 spp.), *Gloeosporium* (5 spp.) and *Marssonina* (2 spp.). The remaining orders of fungi only have one species in each.

It is noticeable that some of the revealed species of fungi feed and were dispersed on several species of trees, but other fungi species were found only on a certain species of tree. For example, *Leveillula taurica* and *L. taurica* f. *caraganae* were found on *Elaeagnus angustifolia* and *Caragana arborescens*. The fungi, such as *Microsphaera betulae*, *M. penicillata*, *M. sambucus*, *M. syringae*, *M. grossularia*, *M. hedwigii*, *M. berberidis*, *Microsphaera* sp. were found in *Betula tianschanica*, *Populus alba*, *Ulmus pinnatoromosa*, *Sambucus racemosa*, *Syringa* sp., *Vitis vimifera*, *Grossularia* sp., *Viburnum opulus* and *Berberis heteropoda*.

Fungi of the genus *Phyllactinia*, such as *P. suffulta salicis*, *P. suffulta populi*, *P. suffulta betulae*, *P. suffulta mali*, *P. suffulta ribesii*, *P. suffulta syringae*, *P. suffulta elaeagni* and *P. suffulta fraxini* feed on *Salix* sp., *Populus nigra*, *Betula tianschanica*, *Malus domestica*,