MULBERRY TREE BACTERIAL CANCER

CANCERUL BACTERIAN AL DUDULUI

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Abstract. *Mulberry tree is a specie commonly used in parks, street alignments etc., but is heavily affected by the attack of phytopathogenic agents such as Pseudomonas mori (Boyer et Lambert, Stevens) and by some species of phytopathogenic fungi such as Mycosphaerella morifolia (Fuck.) Lind., Cercospora pulvinulata Sacc. et Wint.f. angulosa Săvul. et Sandu, Gibberella baccata (Wallr.) Sacc. var. moricola (Nees) Wr. Since 2006 the authors have observed for the first time in Romania, the presence of mulberry tree bacterial cancer produced by Agrobacterium tumefaciens (Smith et.Townsend). Con., on multiple mulberry trees older than 80 years in various areas of the Herastrau Park - Bucharest. The attack occurs on most trees in the form of very large brown tumors, of 1.22 m height and 0.72 m wide, located in the first centimeters above the soil, with irregular rough surface.*
Key words: mulberry, bacterial cancer, tumor

Rezumat. *Dudul este o specie utilizată frecvent în parcuri, pentru aliniamentele stradale etc., însă este afectat în foarte mare măsură de atacul unor agenţi fitopatogeni, ca de exemplu bacteria Pseudomonas mori (Boyer et Lambert, Stevens) şi de unele specii de ciuperci fitopatogene ca: Mycosphaerella morifolia (Fuck.) Lind., Cercospora pulvinulata Sacc. et Wint.f. angulosa Săvul. et Sandu, Gibberella baccata (Wallr.) Sacc. var. moricola (Nees) Wr. etc. Începând cu anul 2006 autorii au observat, pentru prima dată în România, prezenţa cancerului bacterian al dudului produs de bacteria Agrobacterium tumefaciens (Smith et.Townsend).Con., pe mai multe exemplare de dud în vârstă de peste 80 de ani, în diferite zone din parcul Herăstrău – Bucureşti. Atacul se manifestă la majoritatea pomilor sub forma unor tumori de dimensiuni foarte mari, de 1,22 m înălţime şi de 0,72 m lăţime, dispuse în zona coletului, de culoare brună, având suprafaţa aspră, neregulată.*
Cuvinte cheie: dud, cancer bacterian, tumoare

INTRODUCTION

Mulberry (*Morus alba* L. and *Morus nigra* L.) is a highly appreciated specie both for its fruits, with a complex content of nutrient substances but also for its leaves, used to feed the silkworms.

Mulberry fruits contain: organic acids (aspartic, folic, folinic, acetic, citric, propionic, butyric), adenine, arginine, volatile compounds (butilamin), tannin, aldehids, cetons, beta–carotene, calcium carbonate, pectin, vitamin C, antocians, proteine, albumine, lecitine, glutaminic derivates etc, that have an anti-scorbutic, laxative, depurative, hypoglycemic, sudorific action.

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These compounds are efficient in constipation treatment, diabetes mellitus, stomatitis, gingivitis, the thrush, gastric and duodenal ulcers, lung disease and detoxification by the depurative and diuretic effect. Can also be used as a tonic and astringent. Mulberry fruits reduce the appearance of breast nodules by fragranic acid effect, offering protection against cancer. The development of this species, commonly found in parks, street alignments etc., however, is largely affected by the attack of phytopathogenic agents such as *Pseudomonas mori* (Boyer et Lambert, Stevens) that produces mulberry bacterial burning, and by some phytopathogenic fungi species such as *Mycosphaerella morifolia* (Fuck.) Lind. causing leaves brown staining, *Cercospora pulvinulata* Sacc. et Wint. f. *angulosa* Săvul. et Sandu, which causes leaves brown staining, *Gibberella baccata* (Wallr.) *Sacc*. var. moricola (Nees) Wr. causing shoots withering etc.

MATERIAL AND METHOD

The experiment was carried out during 2010-2011 and involved M*orus alba* and *Morus nigra* trees from Herastrau Park and other locations in Bucharest. The method consisted of observations and measurements of the trees diagnosed with cancerous tumors. Measurements involved the size of the tumor, the colour, the external aspect while the observations interested as the position of the tumour on the trees stem (trunk or branches) and the high (m) from the ground.

RESULTS AND DISCUSSIONS

Since 2006 the authors have observed for the first time in Romania, the presence of mulberry tree bacterial cancer produced by *Agrobacterium tumefaciens* (Smith et. Townsend). Con., (V. Severin, 2006) on multiple mulberry trees older than 80 years in various areas of the Herastrau Park - Bucharest.

The attack occurs on most trees in the form of very large brown tumors, of 1.22 m height and 0.72 m wide, located in the first centimeters above the soil, with irregular rough surface. Often, on the same tree, beside the giant tumor from the basal part of the stems are observed throughout numerous tumors, the size of a child's head, which are irregularly distributed around, which sometimes merge of over 1 m distance.

Fig.1 - Cancerous tumor developed at 1 m above the ground (original photo)

In some plants cancerous tumor developed on the stem at a distance of about 1 m above the ground (fig. 1).

At other plants, aged about 25-40 years, the disease is manifested by the presence of numerous cancers tumors, hard, brown, with rough surface, the size of cabbage, irregularly distributed from the bottom to the top of the stem and branches (fig. 2 a, b, c, d).

Fig. 2a - Cancerous tumors irregular disposed on branches and truck (original photo)

Fig. 2b - Cancerous tumors irregular disposed - detail (original photo)

Fig. 2c - Cancerous tumors (original photo)

Fig. 2d - Cancerous tumors disposal all over the tree stem (original photo)

Diseased plants, although some very advanced age, continues to vegetate, but with much lower growth of shoots, leaves and fruit, compared with unaffected trees.

CONCLUSIONS

The fight against this disease is based primarily on preventive measures, including the most important, the use of healthy seedlings for planting only (grown in uncontaminated nurseries). Suspects seedlings coming from infected nurseries will be disinfected before planting by dipping roots into a ditch consists of a mixture of potassium salt 1% and 0.4% calcium chloride.

If seedlings present tumors at removal from the nursery, there will be destroyed by burning.

After dissolution of infected nurseries, the land will be cultivated 4-5 years with cereals, which are resistant to cancer.

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