



## **TYPES OF FUNGAL DISEASES OF MULBERRY**

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### **ANNOTATION**

Resolution of the President of the Republic of Uzbekistan dated March 29, 2017 No PP-2856 "On the organization and activities of the Association" Uzbekpaksanoat " and Resolution of the Cabinet of Ministers of the Republic of Uzbekistan dated August 11, 2017 No 616 "On the program of measures for further development of the silk industry in 2017-2021", as well as Resolution of the President of the Republic of Uzbekistan dated January 12, 2018 No PQ-3472 "On measures to further develop the silk industry in the country" will be the basis for increasing the efficiency of the industry, strengthening integration processes in the silk production complex and improving economic performance of farms and enterprises.

**Key words:** fungal diseases, mulberry, silkworms, environmental conditions.

In order to increase the quantity of silkworms in the country, to improve its quality, it is important to strengthen the nutrient base of silkworms, to create mulberry varieties resistant to productive diseases. Environmental conditions and waste generated by factories located in a certain area also play a key role in the spread of diseases in mulberry seedlings and seedlings. The fight against mulberry diseases should be aimed not only at implementing a single economic policy aimed at increasing their productivity, preserving seedlings, but also at protecting human health, as well as the external environment, using harmless, safe chemical and biological means.

In recent years, the rate of germination of mulberry seeds due to diseases of mulberry, the death of mulberry seedlings, a decrease in yield on the leaves.

It is known that there are more than 30 diseases of the mulberry tree, these diseases are caused by bacteria, viruses, fungi, mycoplasmas. In the conditions of the republic, mulberry is a disease of wilt and fusarium wilt, and young seedlings germinated from seeds are often infected with fusarium wilt.

There is a lot of information in the scientific literature about infectious and non-infectious diseases of tobacco. Mulberry leaves are a unique and irreplaceable food base for silkworms. Therefore, increasing



the productivity of mulberry leaf is one of the important tasks facing agronomists, breeders and plant protection specialists in the field.

More than forty diseases have been reported in the mulberry tree.

These diseases were detected in the territory of the former Soviet Union in Uzbekistan by NG Zaprometov, EM Ashkinadzi, MR Ganieva, A. Sheraliev, MA Zuparov, in Tajikistan by AL Zlotina, in Georgia by MA Kakulia and I. F. Gogelia, N.I. Chanturia, I.F. Gogelia, M.M. Gvinepadze, S. Annaliev in Turkmenistan.

These diseases not only lead to a decrease in crop quality and quantity, but often lead to their death. The main part of these diseases is caused by fungi. Among the infectious diseases of tobacco are the most common fungal diseases. The most damaging of these diseases are powdery mildew, fusarium wilt, root rot, cytosporiosis, cylindrosporiosis and cercosporosis.

Root disease. Mulberry root rot is one of the most common diseases in Italy, Japan, China, India, Eastern European countries, the North Caucasus, Azerbaijan, Georgia, Tajikistan. The disease is caused by the fungus *Rosellinia necatrix* (Hart Berl), a fungus of the genus *Armillaria mellea* Vahl, belonging to the family *Agaricaceae*. According to D.V. Sokolova, root rot is a common disease in Azerbaijan and Georgia. The disease has killed 5-20%, and in some cases even 60%, of all mulberry trees in the Geokchay and Agdash regions of Azerbaijan.

According to NG Zaprometov, mulberry root rot was found in Bukhara region of Uzbekistan and Chinoz district of Tashkent region and in the Fergana Valley. Identified by IS Normin in the Garm region of Tajikistan.

Diseases caused by fungi. Mulberry fungi have been reported to be prevalent mainly in older trees. The disease affects up to 30.0% of mulberry trees in the Fergana Valley and 8.0% to 36.0% of mulberry trees in Yangiyul district of Tashkent region. *Fomes fomertarius* (L.) Gill from the fungus mainly in the mulberry. and *Lnonotus hispidus* (Bull.) Card. encounter has been identified.

Verticillium wilt disease. For the first time, a disease caused by fungi of the genus *Verticillium* on fruit trees.

It was discovered in 1916 in California, USA. It was later observed in the Netherlands and New Zealand. In Central Asia, especially in Uzbekistan, this fungus has been found to infect fruit trees. Information about the occurrence of this disease in Tut IMMimdjanov et al. Outbreaks appear to be exacerbated in Germany, France, Canada, Italy, Australia, Hungary, Syria, the United Kingdom, Yugoslavia, Moldova, Tajikistan, Armenia, Kazakhstan, and other countries.

Cercosporosis disease. R.A.Baiyewu, N.A.Amusa, J.B.Idowu.

Cercosporosis, the causative agent of the disease *Cercospora moricola*, has been studied in the southwestern mulberry groves of Nigeria. A strong course of cercosporosis under the influence of high humidity of the tropical climate has been noted. Especially in weed-infested nurseries, it was observed that during the rainy season, due to the rapid development of the disease, the seedlings shed their leaves.

L. Ghosh, F.A. Neela, M.F. Mahal, M.J. Khatun, M.R. Strong development of the disease was observed in August and September, when the temperature was 25–30°C and humidity above 80%. Applying the



required amount of NKP fertilizers in the soil resulted in a 6-8% reduction in disease. It has been noted that cercosporosis is more common when mulberry seedlings are planted in a 90x90 cm scheme than when planted in a 60x60 cm scheme.

B.K.Chikkaswamy and Rabin Chandra Paramanics during a 1995-1997 study of mulberry plantations in Karnataka, India, studied the pathogens *Cercospora moricola*, the pathogens *Peridospora mori*, the pathogens rust, the pathogen *Phyllactina-cory*. Along with these studies, meteorological data were also collected. The strongest development of cercosporosis was recorded in November, with the lowest development in May. A strong development of un-dew disease was observed from July to November, while a low development was noted to occur from December to May. It has been found that temperature and humidity have an effect on the development of these diseases.

Shayiestah Maqbool, Irfan Illahi, Azad Gull, Ghazala Rizvi have studied the effects of mulberry on cerebrospinal disease in Kashmir, India. The prevalence of the disease in trees was 13.86% and development was 1.98%, in small trees this figure was 7.53% and 1.67%, and in shrubs 3.38% and 0.99%. Due to the disease, a decrease in the amount of water and chlorophyll in the leaves was detected. However, it was noted that the temperature is 25-300 C, humidity 80%, which leads to the rapid development of the disease.

Cytosporosis. Cytosporosis of mulberry is one of the diseases associated with the drying of plant branches. The disease occurs in most fruit and ornamental trees except mulberry. The first data on cytosporiosis were recorded in scientific sources in the XIX century.

Currently, the disease affects a number of countries in Italy, France, Japan, Greece, USA, Hungary, Morocco, Romania, Germany, Canada, Syria, Turkey, the Netherlands, Denmark, the Czech Republic, Slavia, Tunisia, Kazakhstan.

and recorded in Uzbekistan.

Cytosporosis is caused by fungal species belonging to the family *Cytospora*. There are two different views on the pathogenesis of these fungal representatives. Proponents of the first idea say that *Cytospora* fungi live in saprophytes on dry twigs and accelerate their drying. Others say that on the contrary they cause diseases in plants and cause the trees to wither.

The disease was caused by a disease caused by *Cytospora* fungi in Japan, K. Togachi in Japan, A. W. Helton in the USA and B. Kaltschmidt in Germany. In the territory of the former Soviet Union, a number of researchers M.Isin, I.P.Fralov, T.E.Kodyakova, I.S.Popushoy, V.G.Novokhatka, V.Laslo, A.Isroilov, V.I. .Potlaychuk and D.A. Koleslova have been shown to occur in fruit trees.

According to L.S. Gutner, cytosporosis caused great damage to orchards in the former Soviet Union, and in some apple orchards, up to 50% of trees withered due to the disease.

A.S. Bondartsev points out that *Cytospora* fungi often cause weakened trees to build up.M.Isin to plant apple trees in Kazakhstan *Cytospora capitata* Sacc.et Schulz. and *C.personata* Fr. fungal species. A number of studies have been conducted to study the pathogenesis of pathogenic diseases of fungi belonging to the *Cytospora* family and the biological properties of the pathogens. The role of representatives of this family in the drying of fruit trees in the conditions of Georgia was studied by T.A. Tsakadze, T.A. Tsakadze, T.G. Sheliya. Their pathogenicity has been studied using artificial



insemination of plants with these fungal species. *Cytospora capitata* Sacc.et Schulz of the fungus from dried apple twigs type is highlighted.

According to the authors, due to toxins secreted by fungi, plant branches dry out and necrosis occurs. They also studied the morphological and biological properties of pure cultures of *Cytospora* fungi.

Premature drying of legume fruit trees in Moldova has been studied by E.P. Kropis. To study the pathogenicity of *Cytospora* fungi isolated from diseased trees, the researcher observed that when artificially infecting legume fruit trees, a large proportion of them became infected.

M.M. Kurbanov believes that representatives of the *Cytospora* family are responsible for the construction of seed and legume fruit trees in Azerbaijan. E.A. Dvoychenkova, who found that the drying of apple trees in the Moscow region was caused by representatives of the *Cytospora* family, said that *Cytospora schulzeri* Sacc.et Syd in the Central Black Earth zone of Russia. The distribution of the species was studied by MT Khomyakov, who concluded that the fungus of this species is an optional parasite.

A.A.Ablakatova *Cytospora capitata* Sacc.et Schulz. found that the fungus caused Russia to build not only legume fruit trees, but also apple and pear trees in the Far East. When healthy twigs obtained from healthy and diseased apple trees were artificially infested with this fungus by the author, it was observed that twigs obtained from healthy tree were not diseased, but diseased tree twigs were infected. This means that the fungus that causes the disease is a facultative parasite.

A.M. Dobrovolskie studied the cytosporosis of fruit trees in Lithuania and found that the intensive development of this disease depends on the season and the age of the tree, and in apples the disease is mainly *Cytospora schulzeri* Sacc.et Syd., And in plums *C.leucostona* Fr. noted the type excitation.

In the Chui Valley of Kyrgyzstan, apple cytosporosis was studied by II Minkevich and TE Kodyakova. U *Cytospora schulzeri* Sacc.et Syd. found that the fungus is a weak pathogen. Therefore, the author concludes that *Cytospora* fungi in apples in the Chui Valley are caused by complex factors, i.e., *Cytospora* fungi in trees that are weakened due to adverse weather conditions.

Information on the causative agent of cytosporosis of fruit trees in the Republic of Uzbekistan can be found in the scientific works of T.S. Panfilova. The pathogenic properties of these fungi have been proven by artificial infestation of fruit trees. The author noted that cytosporosis affects more grainy fruit trees, while apples are less susceptible to this disease. It promotes the idea that the weakening of trees is the cause of the disease.

Magjan Isinni's monograph on the genus *Cytospora*, which causes cytosporosis, provides a comprehensive assessment of the representatives of this genus, discussing their taxonomy, biology, and parasitic characteristics.

Cylindrosporiosis disease. Cylindrosporiosis is one of the most common diseases of mulberry. The disease has been reported in Japan, Italy, Bulgaria, Australia, Turkey, France, Germany, the United Kingdom, the United States, Central Asia, the Caucasus, the North Caucasus, Ukraine, and Crimea.

Cylindrosporiosis of mulberry was first discovered in 1814 in Italy by Karadori. In the Caucasus, the disease was reported to have spread in the 1960s. Cylindrosporiosis in Central Asia was first identified in 1918 by NG Zaprometov.



# Academica Globe: Inderscience Research

ISSN: 2776-1010      Volume 2, Issue 6, June, 2021

In mid-May 1925 in the Tashkent region of Tashkent region due to cylindrosporiosis was observed yellowing of mulberry leaves. By 1934, the disease had become widespread in Central Asia.

In 1948, the spread of cylindrosporiosis in the territory of Ukraine was noted. Due to the disease, the branches withered and the leaves are shed prematurely. This led to a decrease in the silkworm food base. Such development of cylindrosporiosis was caused by frequent rains during the summer. Outbreaks appear to be exacerbated in Kiev, Chernigov, Poltava and Sumy regions.

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