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Issue Article

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FUSARIOSIS DISEASE OF LEMON PLANTS

Abstract: *Researches have been conducted to identify the fungi that cause Fusarium disease in lemon plants. According to the research results, Fusarium oxysporum f., belonging to the Fusarium family, which causes Fusarium disease in lemon plants. citri fungus has been found to cause. The effects of potato-dextrose agar and Chapek media on the color change of these fungal cultures were studied differently.*

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Introduction

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Relevance of the topic. A number of reforms are being carried out in the Republic of Uzbekistan regarding the cultivation of citrus plants, the introduction of new varieties brought from abroad, the expansion of their area, the production of products and the increase of export volume.

Citrus fruits contain a large amount of vitamins, minerals, organic acids, and healing nutrients necessary for the human body. In particular lemon is the most cultivated citrus plant in Uzbekistan and it is considered one of the most valuable healing and refreshing fruits.

The fruit contains about 2% sugar, 6-8% various acids (mainly citric acid), more than 1% pectin substances, about 0.5% various mineral salts, 60-90 mg. Vitamin C in certain amounts. There will be vitamins A, V1, V2, RR.

Diseases such as fusarium, phytophthora, gommosis, alternaria and fruit rot in lemon plants can greatly damage the expected yield during the plant's vegetation period.

Fungi that cause fusarium diseases in plants belong to the genus Fusarium, which belong to the kingdom of true fungi (Mycota), phylum Ascomycetes (Ascomycota), class Sordariomycetes, family Nectriaceae of the order Hypocreales. The names of the teleomorphic stage of many species of this family (Gibberella, Albonectria, Haematonectria) have been reduced to the level of its synonyms [2, 3].

Species of the genus Fusarium are facultative parasites, and there are four types of fusarium wilt in citrus crops, namely 1) fusarium wilt of seedlings; 2) root dry rot; 3) blight and 4) forms of fusarium rot of fruits [1, 4, 5, 6].

Fusarium wilt disease is caused by Fusarium oxysporum f. sp. citri provokes. The pathogen has been observed in true lime grown on Rangpur lime grafts in Brazil and India; Common in hardy citrus varieties grown in greenhouses in Florida, USA. The first symptoms of the disease are characterized by the formation of reticulate chlorosis on young leaves, they bend down, wither, fall off, dry from the tips of young branches. The formation of glue on the stems of dying plants and staining of their conducting tubes is often observed. The disease kills true limes and other hardy

citrus trees. Rangpur lime, Milam and jambiri lemons are more resistant to the disease, their leaves also show chlorosis and epinasty, tree stunting, but they may die due to the disease in rare cases. Many other types of citrus plants do not develop external symptoms of the disease [1, 6].

Species of the genus Fusarium are widespread in the soil of citrus orchards and nurseries. Most of them are Fusarium solani species and it is the dominant species isolated from the roots of trees affected by root dry rot. In rare cases, F. oxysporum from the roots and rhizosphere of plants, and then other secondary invasive or opportunistic pathogenic species of this family (F. equiseti, F. semitectum) is also separated. Along with F. solani, 2 more species - F. proliferatum and F. sambucinum - were isolated from the roots of infected citrus trees in Greece and it was proved that they cause root rot in citrus in artificial infection experiments. In the Mediterranean region - in Italy, Greece, Egypt and Tunisia, F. solani is dominant (62-75%, 45% in Tunisia), F. oxysporum (50%) takes the 2nd place. was 13% [6].

Root rot caused by F. solani is a serious problem in citrus trees, but its distribution is sporadic, that is, limited. Root dry rot has been reported in citrus plants in Europe (Italy, Greece, etc.), Asia (India), North (USA) and South America (Puerto Rico), Africa (JAR, Egypt, Tunisia) and Australia, new in the Mediterranean region is an emerging problematic disease [1, 4, 5, 6].

The toxicity of the fungus F. oxysporum to citrus is much higher than the toxicity of F. solani; in experiments, 30% and 80% of citrange seedlings treated with the culture fluid of two isolates of F. oxysporum died, and isolates of F. solani killed 20% [6]. In most cases, after the first signs of dry root rot appear, affected trees quickly become severely weakened or die completely within a year or two.

Frequent watering of the soil with benomyl is highly effective against Fusarium disease. The most effective measure is not to introduce the pathogen into the greenhouse [1, 6].

Research methods.

Isolation of pure cultures on standard agar media. For tube-to-tube inoculation of liquid or solid media, both tubes (sterile medium and tube containing fungal culture) are held parallel in the left hand between the fingers and held by the thumb. In this case, the environment in the test tube should be clearly visible. A mycological or bacteriological swab is held in the right hand. The mycological swab is held for sterilization in the fire, then with the fingers of the right hand, the stopper (stopper) of the test tubes is removed, and the mouth of the test tubes is sterilized in the fire.

Isolation of phytopathogenic fungi from plant roots. Freshly dug roots are washed in sterile water and the remaining water is absorbed with filter paper. Then, 1-3 cm cut root pieces or uncut small roots are placed on the surface of Petri dishes lined with filter paper and placed in a thermostat with a temperature of 26°C. Monitoring the growth of fungi and separating them is done after 24-48 hours or in the following days of growth.

Separation from damaged tissue. Using a scalpel heated in the flame of a gas torch or an alcohol lamp, the tissue is cut from the healthy part to the affected side. A small piece is cut from the border of the diseased and healthy tissue and transferred to a test tube containing wort agar medium.

Extraction from stems and leaves. Fungi can be isolated, in some cases, not only from newly introduced plant members, but also from their herbariums. For this, the material brought to the herbarium should be quickly dried and protected from foreign microflora. The plant stems, leaves and their parts are placed on a sterile filter paper and dried. After the stem or leaves are dried, a second sterile filter paper is transferred and stored in this condition until the study is carried out.

The preserved material can be placed in a wet chamber or observed under a binocular microscope. After 1-2 days of drying, the mushrooms are separated.

Research results. In 2021-2022, directional observations were conducted in the Okdarya district of the Samarkand region in order to study lemon diseases.

During the observations, samples of lemon plants infected with diseases (stem, leaf) were brought to the laboratory. Fusarium-causing fungi were isolated from infected parts of lemon in potato-dextrose agar nutrient medium in laboratory conditions, and studies were conducted to determine their species composition.

After washing and cleaning the samples affected by the disease, the affected parts were cut using a special cutting knife. In a laminar box, sterilized Petri dishes were placed with glass and the required amount of water (to create moisture) was placed. The excised specimens were dipped with tweezers first in 96% alcohol and then in distilled water and planted in Petri dishes around a flame lamp.

These samples were sterilized and planted for the experiment and placed in a thermostat at a temperature of 20-24°C. On the 3rd day of observation, fungi began to grow from the samples in the Petri dishes. Fungi grown in flasks were replanted on Chapek and potato-dextrose agar media and placed in a thermostat for growth and propagation.

By the 5th day of the laboratory experiments, the fungal spores grown in the nutrient media in the Petri dishes were replanted in test tubes for propagation and preservation.

According to the results of the research, Fusarium oxysporum f., a member of the family

Nectriaceae, family of Nectriaceae, phylum of Ascomycota, class of Sordariomycetes, which causes the disease of fusarium (gommosis, glue leakage) in lemon plants. citri was found to be caused by a type of fungus.

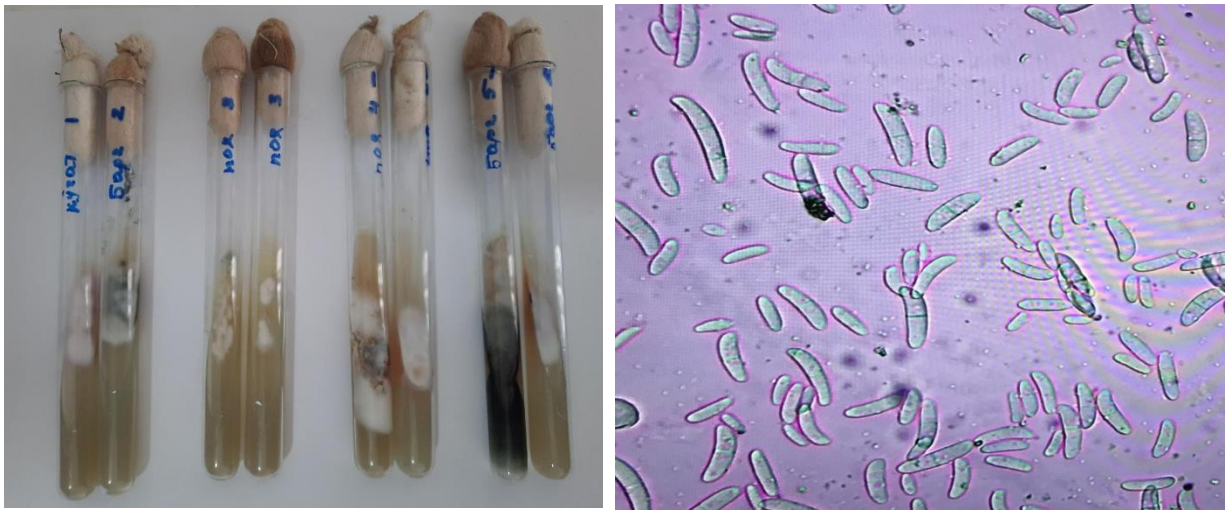

Figure 1. Micro and macroconidia of Fusarium fungus

Fusarium oxysporum f. Scientific research was carried out in laboratory conditions to study the effect of different potato-dextrose agar and Chapek nutrient media on the development of citri fungus and color change of cultures. Fungal cultures were grown for two weeks at a temperature of 20-24°C.

According to the monitoring results, Fusarium oxysporum f. Citri cultures were exposed to potato-dextrose agar media, which turned white and then purple after 14 days. Chapek appeared white in the nutrient environment.

Fusarium oxysporum f. Citri was observed to grow moderately on potato-dextrose agar and Chapek medium.

Summary. Fusarium oxysporum f. belonging to the genus Fusarium, which causes fusarium disease in lemon plants. It was found that the effects of potato-dextrose agar and Chapek nutrient media on the growth of the fungus citri and the color change of these fungal cultures were different.

References:

1. Anderson, C.A., Barkley, P., Brlansky, R.H., et al. (32 authors total). (1993). *Compendium of citrus diseases.* Whiteside S.M., Garnsey S.M., Timmer L.W. (eds.). APS Press, USA, 1993, vi + 80 pp. + 171 color plates.
2. Geiser, D.M., Aoki, T., Bacon, C.W. Baker, S.E., Bhattacharyya, M.K., Brandt, M.E., et al. (66 authors total) (2013). Letter to the editor: One fungus, one name: Defining the genus *Fusarium* in a scientifically robust way that preserves longstanding use. *Phytopathology*, vol. 103, No. 5, pp.400-408. http://hdl.handle.net/2078.1/135001.
3. O'Donnell, K., Ward, T.J., Robert, V.A.R.G., Crous, P.W., Geiser, D.M., & Kang, S. (2015). DNA sequence-based identification of *Fusarium*: current status and future directions. *Phytoparasitica*, vol. 43, No. 3, pp.583-595. DOI 10.1007/s12600-015-0484-z.
4. Olsen, M., Matheron, M., Mc Clure, M., & Xiong, Z. (2000). *Diseases of citrus in Arizona.* Based on material originally written by Hine R., Matheron M., True L. The Univ. of Arizona Cooperative Extension. AZ1154, 2000, 15 p.
5. Tennant, P.F., Robinson, D., Fisher, L., Bennett, S.-M., Hutton, D., Goates-Beckford, P., & Mc Laughin, W. (2009). Diseases and pests of citrus (*Citrus* spp.). *Tree and Forestry Science and Biotechnology*, vol. 3 (Special issue 2), pp. 81-107. © Global Science Books.
6. Yaseen, T., & D'Onghia, A.M. (2012). *Fusarium spp. associated to citrus dry root rot: an emerging issue for Mediterranean citriculture*. Proc. XXVIII[th] IHC – IS on the Challenge for a Sustainable Production,

Protection and Consumption of Mediterranean Fruits and Nuts. Eds.: A.M. D'Onghia et al. Acta Hort. 940, ISHS 2012, pp. 647-655.