



FUNGAL DISEASES OF CAPSICUM ANNUUM L. PLANTS IN THE NAMANGAN AND BUKHARA REGIONS

Teshaboeva Sh.A., To‘raboiev M.B., Kholmuradova T.N., Iminova M.M., Jo‘rayev S.G.
Institute of Botany, Academy of Sciences of the Republic of Uzbekistan, Tashkent,
Republic of Uzbekistan
e-mail: shteshaboeva@gmail.com

Abstract: This article provides scientific information on the fungal species affecting *Capsicum annuum* L. plants. Research identified five fungal species from two sections, four classes, five orders, five families, and five genera present in bell pepper plants. Our mycological analysis reveals that Ascomycete (Ascomycota) fungi are the predominant group, comprising four species from three classes, four orders, four families, and four genera.

Pepper (*Capsicum annuum* L.), a member of the Solanaceae family, is cultivated for its herbaceous, upright stem, which typically reaches a height of 25-80 cm and exhibits branching. The plant has small, thin, elongated leaves that may be smooth or hairy on the upper surface. Its flowers are bisexual, small, and may be white, yellow, or light purple, featuring nine petals. Blooming occurs 80-90 days after planting, usually from June to July, and continues until autumn frosts.

Capsicum annuum is a facultative self-pollinating plant, though up to 25% of its fruits can result from external pollination. Insects such as ants, thrips, and bees contribute to this process. To avoid cross-pollination, especially between hot and sweet pepper varieties, they should be planted at a sufficient distance from each other. The fruit is a multi-seeded berry with 2 to 6 chambers. Hot pepper fruits are typically small, oblong, and may be horn-shaped, bell-shaped, or similar. They have thin, fleshy skins and mature to colors such as red, yellow, or orange. The seeds are light yellow, flat, and round, weighing 4-8 grams per 1000 seeds, with a fertilization rate of 80%. The root system is shallow, with the main roots extending to a depth of 20-30 cm (Mamatkulov, 2021).

This article was prepared using resources from the Mycology and Algology Laboratory of the Academy of Sciences of the Republic of Uzbekistan, supported by the laboratory's funding for the period 2021-2024. The project, titled "Diseases in Economically Important Plants, Exportable Fruits, Vegetables, and Sugar Crops," provided essential materials for this research. Herbarium specimens collected during mycological research, conducted under the state program "Pathogenic Fungi: Diversity, Monitoring, and Creation of an Electronic Database" were utilized as primary sources. The species composition of fungi was analyzed using a Moticam N-300M microscope, supplemented by identifiers from scientific literature and online sources (Hasanov et al., 2008; G'affarov, 2005). Fungal nomenclature was updated according to the Index Fungorum (Index Fungorum, 2024), while plant names were verified based on the Plant of the World Online database (POWO) (powo.science.kew.org, 2024).

Our analysis of fungal samples from the Tashkent Mycological Herbarium (TASM), combined with a review of scientific literature and our own field research, revealed the presence of various fungi affecting *Capsicum* species of economic importance in the Namangan and Bukhara regions. We identified fungi from 4 classes and 5 orders, distributed across 2 sections: Ascomycota and Mucoromycota. These fungi belong to 5 families and 5 genera. Our mycological analysis shows that Ascomycete (Ascomycota) fungi are the dominant group, comprising 4 species distributed across 3 classes, 4 orders, 4 families, and 4 genera. Fungal Diseases Affecting Economically Important *Capsicum annuum* L. Plants in the Namangan and Bukhara Regions: Symptoms and Distribution.

Cladosporiosis Disease in Bell Pepper

Pathogen: *Fulvia fulva* (Cooke) Cif.

Symptoms: Cladosporiosis typically begins during the flowering and fruiting stages of *Capsicum annuum* L. and predominantly affects the leaves. Initial symptoms include yellow or light-green spots on the lower leaves, with corresponding colorless, yellowish, or light-brown

spots on the undersides. These spots are covered with greenish-brown, soft mold. The disease rapidly spreads to the upper leaves, causing severely affected leaves to turn purple and dry out. Infected flowers and fruits also exhibit a brown discoloration (see Fig. 1).

Spread: This disease is prevalent in the Namangan region, particularly in the districts of Mingbulok, Norin, and Torakorgan.

Countermeasures: The infection primarily persists in plant residues. Therefore, it is essential to promptly remove plant debris and weeds from crop fields. Additionally, maintaining proper watering practices is crucial to managing the disease.

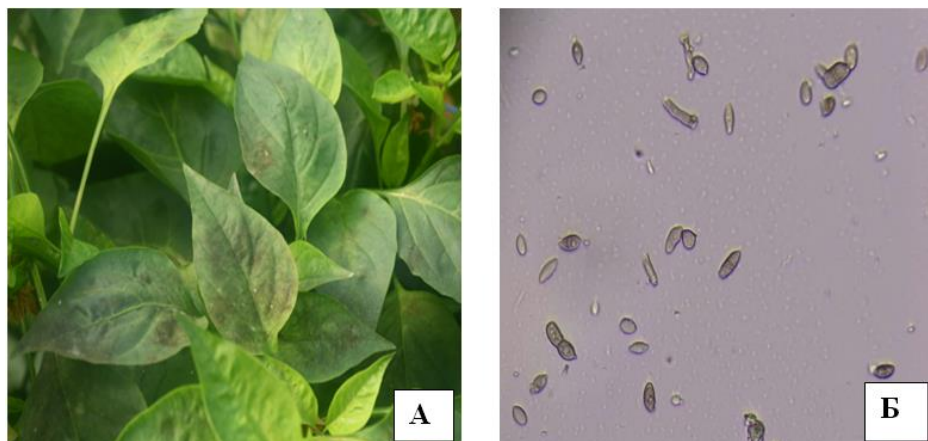


Figure 1. Cladosporiosis disease in bell pepper, appearance of the fungus under a microscope.

Fusarium Disease of Bell Pepper

Pathogen: *Fusarium oxysporum* Schltdl

Symptoms: Infection with Fusarium leads to yellowing of the upper leaves and a slight loss of leaf moisture. The affected leaves become dark yellow-brown, and the stem becomes thin and weak. Pink spots appear on the affected areas. Seedlings may collapse, and rot is observed in the root, root neck, and lower part of the stem (see Fig. 2).

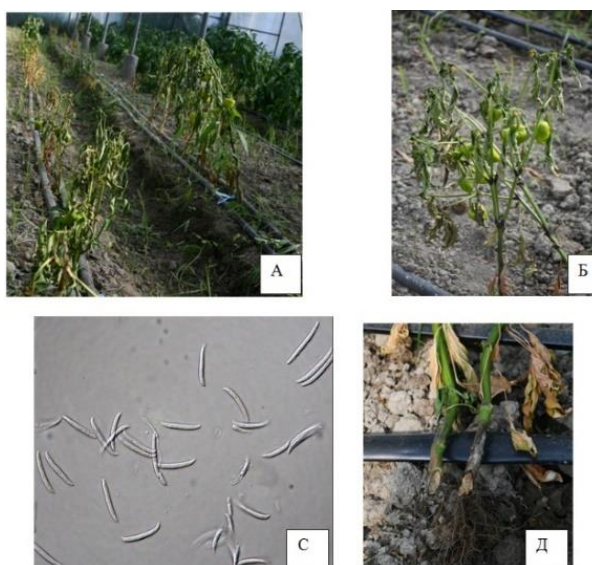


Fig 2. Fusarium disease in bell pepper A, B, D - General appearance of a plant affected by fusarium C - Fungal spores

Spread: This disease is prevalent in the Bukhara region, particularly in the Vobkent district.

Countermeasures: The pathogen persists in soil and plant residues and can spread through fungi, insects, and plant care equipment. To manage the disease, it is crucial to promptly remove plant debris and weeds from crop fields and maintain proper watering practices.



Fig. 3: Appearance of Powdery Mildew Disease on Fruits and Leaves of Bulgarian Bell Pepper

Taxonomic composition of mycobiota of *Capsicum annuum* L

Department	Class	Order	Family	Category	Genus
Ascomycota	Dothideomycetes	Mycosphaerellales	Mycosphaerellaceae	<i>Fulvia</i>	<i>F. fulva</i>
		Pleosporales	Pleosporaceae	<i>Alternaria</i>	<i>A. solani</i>
	Sordariomycetes	Hypocreales	Nectriaceae	<i>Fusarium</i>	<i>F. oxysporum</i>
	Leotiomycetes	Helotiales	Erysiphaceae	<i>Leveillula</i>	<i>L. taurica</i>
Mucoromycota	Mucoromycetes	Mucorales	Mucoraceae	<i>Mucor</i>	<i>Mucor</i> sp.
2	4	5	5	5	5

In the Namangan and Bukhara regions, the following fungal diseases affecting *Capsicum annuum* L. were identified: *Fulvia fulva*, *Fusarium oxysporum*, *Leveillula taurica*, *Alternaria solani*, and *Mucor* sp.

References

100 kitob to'plami, Achchiq Qalampir Yetishtirish 36-kitob, Rustam Mamatqulov, «Agrobank» ATB.-Tashkent: "TASVIR" publishing house, 2021 – 44 b.

Hasanov, B. O. Ochilov, R. O. Gulmurodov, R. A. Sabzavot, kartoshka hamda poliz ekinlarining kasalliklariva ularga qarshi kurash. Toshkent, 2008.

G'afforov, Yu.Sh. Yuksak o'simliklarining mikromitsetlari: Biol. fan. nom. diss. avtoreferati. – Toshkent, 2005. –19 b.

<https://www.indexfungorum.org/names/Names.asp> Index Fungorum. indexfungorum.org (Date of application: 10.06.2024 йил).

<https://powo.science.kew.org/> Kew science Plants of the World online. powo.science.kew.org (Date of application: 10.06.2024).