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Effect of Different Environmental Conditions on the Viability of Pathogenic Tomato Fungi

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ABSTRACT: This article presents the effect of different environmental conditions on the survival of pathogenic fungi *Phytophthora infestans*, *Fusarium oxysporum* f.sp. *lycopersici* and *Alternaria solani* on tomatoes, and when affected tomato organs were stored for 100 days at a depth of 20 cm in P. *infestans* F. *oxysporum* f.sp. *lycopersici* and *A. solani* disease signs were not observed on leaves, but pathogen development was observed on stems.

Keywords: tomato, pathogen, fungus, *Phytophthora infestans*, *Fusarium oxysporum* f.sp. *lycopersici*, *Alternaria solani*, chlamydospores, mycelium, conidia.

The role and importance of the agricultural sector in the food security of the world's population is growing by the day. In particular, the relevant issue is the rational use of available resources and opportunities in our country, guaranteed provision of the population with agricultural products, further improvement of crop yields and interest, introduction of scientific achievements and modern approaches. Up to 24% of the world's crops per year are destroyed by pests, weeds and diseases. Total damage to agriculture exceeds \$75 billion a year. There are currently about 1,000 different chemicals used around the world to protect plants from pests, weeds and diseases. The use of pesticides helps to save 100,000 tons of crops a year.

At all stages of human development, the provision of delicacies is a key issue. One of the main tasks is to protect plants from pests (pests, diseases and weeds). In our country, it is important to develop protection of cotton, grain, potatoes, fruits, vegetables and other crops and plants against pests.

It is known that the study of the viability (overwintering) of pathogenic fungi under various conditions is an important task for the proper determination of plant disease control measures. With this in mind, we studied the effect of different environmental conditions on the viability of the fungi *Phytophthora infestans*, *Fusarium oxysporum*, *Lycopersici* and *Alternaria solani* on tomatoes.

P. infestans is a heterothallic organism that reproduces sexually. When mycelium belonging to different sexes is added, a sexual process called oogamy occurs, resulting in the formation of an oospore. Oospores are large spores with a thick shell, which, unlike zoospores, allow the organism to survive for a long time in plant debris or directly in the soil.

Soil containing oospores can be a source of pathogen infection on the plant. This further increases the risk of *phytophthora* [5; 164-p].

The causative agent of fusariosis is *F. oxysporum* f.sp. *lycopersici* persists in the soil in the form of chlamydospores, mycelium, and conidia [6; 298-p].

The fungus *A. solani*, the causative agent of *Alternaria* can persist in the soil on affected plant debris and seeds in the form of mycelium, chlamydospores, and conidia. The conidia produced are spread by wind, rain spray, and other means [1; 227-b].

In order to study the viability of *P. infestans*, *F. oxysporum* f.sp. *lycopersici* and *A. solani* in different environmental conditions in 2018 - 2019, the affected leaves, stems and fruits of tomatoes were placed in special nets for 100 days at a depth of 20 cm (in the soil). Pathogen survival was determined after 30 and 100 days.

Influence of environmental conditions on the viability of pathogenic fungi

Institute of Genetics and Experimental Plant Biology, Academy of Sciences of the Republic of Uzbekistan, laboratory experiments, 2018-2019.

Name of pathogen	Affected plant organs	Viability of fungi in different conditions			
		After 30 days		After 100 days	
		*a	*b	*a	*b
<i>P. infestans</i>	leaves	+	+	-	-
	stems	+	+	+	+
	fruits	+	+	+	+
<i>F. oxysporum</i> f.sp. <i>lycopersici</i>	leaves	+	+	-	-
	stems	+	+	-	+
<i>A. solani</i>	leaves	+	+	-	-
	stems	+	+	+	+

Note: + grown; - not grown. *a- above the soil; *b-in the poche, (to a depth of 20 cm).

In this case, potato-dextrose agar nutrient medium with streptomycin was used to detect pathogenic fungi. According to the results, it was found that under laboratory conditions the pathogen on the affected organs of tomato (stems, fruits) *P. infestans* and *A. Solani* did not lose their viability up to 100 days.

When stored for 30 days above the soil under natural field conditions on leaves, stems, and fruits of *P. infestans*, *F. oxysporum*f.sp. *A. Solani*was observed to develop fungi. During storage for 100 days, *P. infestans* and *A. solani* fungi developed on stems and fruits.

When infected organs were stored for 100 days at a depth of 20 cm in *P. infestans* *F. oxysporum*f.sp. and *A. solani*, no signs of fungal viability were observed.

Infestation of fruits and stems with *P. infestans* and infestation of stems with *F. oxysporum* f.sp. *lycopersici* and *A. solani*

To summarize, we can say that at a depth of 20 cm under the soil during storage of infected tomato organs for 100 days of *P. infestans* *F. oxysporum* f.sp. *lycopersici* and *A. solani* no signs of fungi viability were observed on leaves, and pathogens development was observed on stems.

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