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OAJI (USA) = 0.350

SOI: [1.1/TAS](#) DOI: [10.15863/TAS](#)

International Scientific Journal Theoretical & Applied Science

p-ISSN: 2308-4944 (print) e-ISSN: 2409-0085 (online)

Year: 2022 Issue: 12 Volume: 116

Published: 03.12.2022 <http://T-Science.org>

Issue

Article



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BIOLOGICAL FEATURES OF ALTERNARIA DISEASE DURING GROWING AND STORING VEGETABLE CROPS

Abstract: *Alternaria alternata*, *A. solani*, *A. brassicae*, *A. radicina*, *A. porri* cause significant damage to vegetable crops in the developed countries of the world. Due to the defeat of diseases caused by fungi, this leads to a decrease in the amount of the crop and deterioration in its quality. Given this, it is of strategic importance to continue research activities to implement measures to combat pathogenic fungi.

Key words: pathogen, vegetable crops, fungi species, fungus, alternariosis, pathogenicity, infection, fungicide, genus, parasite, phytotoxin.

Language: English

Citation: Khalmuminova, G. K., & Boboqulov, O. A. (2022). Biological features of alternaria disease during growing and storing vegetable crops. *ISJ Theoretical & Applied Science*, 12 (116), 6-9.

Soi: <http://s-o-i.org/1.1/TAS-12-116-2> **Doi:**  <https://dx.doi.org/10.15863/TAS.2022.12.116.2>

Scopus ASCC: 1100.

Introduction

Alternaria diseases in vegetable crops grown in the conditions of our republic have not been studied on a planned basis. A.M. Muminov, V.I. Pessov and others reported the occurrence of *Alternaria* in cabbage, potatoes, and tomatoes in the conditions of the Tashkent region [5]. According to B.A. Khasanov, alternariosis diseases are widespread in vegetable crops, *A. alternata* in tomatoes, *Alternaria solani* in potatoes, *A. radicina* in carrots, *A. brassicae* and *Alternaria brassicola* in white cabbage, dark-red onion (alternariosis). Those who gave information about *Alternaria porri* and *A. cucumerinum* damage in cucumber crops [2]. 10 species belonging to the *Alternaria* family occupy a special place in Volume VI of the "Flora Gribov Uzbekistana" directory [7]. Studies on the development of effective control measures for the study of alternaria disease, which has spread in recent years in vegetables grown in our republic, have not been carried out sufficiently.

Therefore, scientific research was carried out to determine the spread and damage of alternaria disease

of vegetable crops, and to study the effect of anti-disease fungicides on the productivity and quality indicators of vegetable crops.

The genus *alternaria* includes saprotrophic and parasitic fungi that feed as necrotrophs. They often develop on plant leaves, sometimes seeds and other terrestrial organs.

Saprotrophic species live on old and dying parts of plants and plant remains on the soil. Parasitic species also often infect physiologically mature, senescent tissue, or weakened plants, and are usually unable to infect young leaves of healthy plants [3]. It is important that the spores (conidia) of this species are easily separated from the conidiophores and spread easily through the air, the mycelium and spores are dark in color, and the incubation period of phytopathogens is short; in particular, the presence of melanin pigment ensures that their spores and mycelia are resistant to solar radiation and adverse environmental conditions.

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In addition, a number of secondary metabolites, especially phytotoxins, synthesized by many species of these fungi play an important role in plant damage.

Alternaria disease also causes a lot of damage to tomato plants. In the process of getting to know the literary sources, it became known that *Alternaria* disease in the tomato plant is widespread and one of the most damaging diseases in Europe, North America, Asia, and Africa [11,12].

Method of conducting research. The method of determining the damage of *Alternaria* disease to vegetable crops. The number and weight of vegetables are taken into account to determine the yield reduction.

The number of plants in the tested samples was 10. The number of healthy and diseased vegetables in the samples was calculated, and the difference between the number of diseased plants and vegetables

was expressed as a percentage, and the damage of the disease was found by the following formula.

$$B = (A-a) \times 100 / A$$

B- lost yield, %

A-harvest of healthy plants;

a-harvest of a diseased plant [1].

Research results.

We collected herbarium samples from infected vegetable crops, we isolated representatives of the genus *Alternaria*, which causes *Alternaria* disease, from herbariums brought to the laboratory.

We identified the isolated fungal species using the identifiers of P. Neergard, M.B. Ellis, N.M. Pidoplichko, E.G. Simmons, F.B. Hannibal, A.S. Orina, the list of infected plants is presented in Table 1 [10, 9, 1, 12, 13, 4, 6].

Table 1. Vegetable crops infected with Alternaria
(Alokhan Isokhon Agro, Tashkent district, Tashkent region farm, 2014-2015)

№	Vegetable crops	Diseases name	Pathogens
1	2	3	4
1.	Tomato	alternating brown spotting	<i>A.alternata</i>
		(fruit black mold)	<i>A.alternata f.sp.lycopersici</i>
		dry spotting	<i>A.solani</i>
		dry spotting	<i>A.tenuissima</i>
2.	Potato	alternating spotting	<i>A.solani</i>
		alternating brown spotting	<i>A.tenuissima</i>
3.	Cabbage	black spotting	<i>A.brassiccae</i>
		alternating spotting	<i>A.brassiccola</i>
		olive brown spotting	<i>A.japonica</i>
4.	Carrot	brown spotting	<i>A.dauci</i>
		black rot	<i>A.radicina</i>
5.	Pepper	alternaria fruit rot	<i>A.alternata</i>
		alternating spotting	<i>A.capsici-annui</i>
6.	Turnip*	brown spotting	<i>A.brassiccae</i>
		alternating spotting	<i>A.japonica</i>
7.	Radish*	alternaria rot	<i>A.brassiccola</i>
		alternating spotting	<i>A.japonica</i>
8.	Rapeseed*	brown alternariosis	<i>A.brassiccae</i>
		alternating spotting	<i>A.brassiccola</i>
9.	Radish (turp)*	black spotting	<i>A.brassiccae</i>
		brown fruit rot	<i>A.japonica</i>
10.	Beetroot*	brown spotting	<i>A.alternata</i>
		alternating spotting	<i>A.solani</i>
11.	Parsley*	black spotting	<i>A.ramulosa</i>
12.	Eggplant*	brown spotting	<i>A.solani</i>
13.	Onion	dark red (alternaria)	<i>A.porri</i>
14.	Garlic*	brown spotting	<i>A.porri</i>

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15.	Dill*	alternating spotting	<i>A.radicina</i>
16.	Salad*	brown spotting	<i>A.japonica</i>
17.	Kashnich*	alternating spotting	<i>A.radicina</i>
18.	Celery*	alternating spotting	<i>A.radicina</i>

*- **Reminder:** Alternaria disease was recorded for the first time in vegetable crops grown in Tashkent region.

Fungal strains isolated from fruits and vegetables were grown in laboratory conditions and monospored seedlings were isolated from them. In turn, as a result of careful study of the morphological and some physiological characteristics of each strain, the composition of species was determined with the help of identifiers.

As shown in the second diagram, 9 species of *Alternaria* fungi were isolated from fruits and vegetables stored in warehouses.

Alternaria alternata is the main part of these isolated fungi. *Alternaria tenuis* and *Alternaria consortiale* strains occupied 10-15% of the strains. The number of strains of all other types was around 5-8%, and their weight was about half of all strains in the total.

Alternaria disease causes great damage by damaging leaves, stems, root nodules and fruits. Especially in potato varieties prone to this disease, up to 40% of the harvest, and in some cases even more, was observed to die [5]. As a result of the development of *Alternaria* disease, the root nodule and the amount of starch in it decreases sharply [3].

Alternaria fungi cannot provide complete information on the distribution, level of occurrence, and impact on productivity of vegetable plants during vegetation and fruit storage. In order to obtain such information, it is required to carry out planned and large-scale scientific and research work [13].

Summary.

Only healthy fruits are taken for transportation and storage. When picking fruits, attention is paid to their mechanical damage. Before placing the fruits in storage, they are cleaned of all impurities, and the warehouse is disinfected with chlorinated lime or formalin. Keeping the temperature and relative humidity of the warehouse at the required parameters during storage increases the shelf life of fruits. Fruits that start to rot are lost immediately.

To reduce the stock of pathogens in the soil, the recommended crop rotation for this region is followed and regular weed control is carried out. Bringing seeds from affected areas is strictly prohibited.

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