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SEPARATION AND ANALYSIS OF FUNGI FOUND IN VEGETABLES

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Annotation
Pure cultures of yeasts belonging to different families were isolated from the epiphytic microflora of tomato and cucumber vegetables. Among them, Saccharomyces sp. and Hansenula sp., Candida sp., Torulopsis sp., Rhodotorula sp. and Trichosporon sp. analysis of yeasts such as

Keywords: vegetables, microflora, yeast, food, essential oils, fruits and vegetables.

Introduction

It is known that fruits and vegetables are the most necessary products of human food. Fresh fruits and vegetables have the same antimicrobial properties as living (plant) organisms. This property in them protects against microbial diseases for a certain period of time. Such a specific immunity of fruits and vegetables is the presence of glycosidic substances, essential oils, and phytoncides in their juice, which have the ability to kill disease-causing microorganisms. Such substances are present not only in the skin of fruits and vegetables, but also in their juice, which can protect the skin before it is injured [1].

Epiphytic microflora of fruits and vegetables includes lactic acid, acetic acid and spore-forming bacteria, as well as various fungi. Some fungi can release toxic substances, that is, mycotoxins, which are dangerous for human and animal life [1, 3].

The outer layer of fruits and vegetables contains a certain amount of various microorganisms that multiply slowly. This is epiphytic microflora, that is, epiphytic microflora are microorganisms that live without damaging the outer layer of the plant without entering the tissues [4, 5].

The microflora of undamaged fruits and vegetables is not rich in representatives. Its composition is variable. These are sporulated and non-spored (*Pseudomonas herbicola, Flavobacterium, Sarcina, Lactobacillus plantarum*), mycelial fungi (*Cladosporium, Botrytis, Alternaria,Fusarium*)yeasts (*Saccharomyces, Cryptococcus, Rhodotorula*) and others [7, 8].

During harvest, transportation, and storage, the amount and biomass of microbes increases rapidly [7]. This is due to the fact that the skin of fruits and vegetables is thin and can be damaged, and the cell sap that flows from it is a favorable food environment for the growth of microorganisms. The composition of microflora can change during the life of plants and during the storage of agricultural products (fruits, vegetables and grains) [1].

The purpose of the work is to study yeast fungi in epiphyte microflora of vegetables such as tomato (*Lycopersicum esculentum* L.) and cucumber (*Cucumis sativus* L.).

Key words:
Epiphyte microflora, Pseudomonas herbicola, Flavobacterium, Sarcina, Lactobacillus plantarum, Cladosporium, Botrytis, Alternaria, Fusarium, Lycopersicum esculentum L., *Cucumis sativus* L.

Materials and working methods

The results for the study were obtained from tomato and cucumber vegetables grown under field conditions in the Republic of Karakalpakstan in May-June 2020.

Initially, the method of planting in a liquid microbiological nutrient medium was used to study the epiphytic microflora. For this, a smear was taken from the outer skin layer of tomato and cucumber vegetables using a sterilized cotton swab and mixed in a test tube with sterilized water in a predetermined autoclave. After a certain period of time, they were planted in several sterile nutrient media, placed in a thermostat and monitored [2].

During the determination of the epiphyte microflora of tomato and cucumber vegetables, wort-agar media was used. Chapek and Martin nutrient mediums were also used, and cultivation methods were carried out in several stages: 1) 1 g of sample was taken and placed in 5 ml of liquid grape must, and after a little shaking, it was placed in a thermostat at 260C for 48 hours; 2) after 2 days, it was removed from this liquid and planted in a Petri dish with wort-agar solid food medium in a repeated manner and left in a thermostat at a temperature of 260C for 2-3 days; 3) After 3 days, the grown fungal colony was planted on slant agar (in test tubes, the juice was solidified by putting suslo-agar, and then 2 of each colony were transferred to a test tube), then it was placed in a thermostat at a temperature of 260C for 5-7 days; 4) After 3-4 days, the culture of yeasts grown on slant agar was observed under a microscope to check the purity (to see if the microorganism cells belong to the same species). It was also checked whether the cultures of fungal microorganisms isolated by this method produce spores or not [2].

"Horodkova" nutrient medium and gypsum block method were used to study the formation of spores by microorganisms. After the growth of microorganism cultures, it was removed from the thermostat and carefully observed under a microscope, and the spore-forming micro-organisms (the shape and number of spores per bag) were determined. A pure culture of the fungus was isolated by inoculating the fungal culture several times on solid nutrient media using the pure culture isolation method.

After that, the cultural, morphological and physiological characteristics of pure cultures of isolated fungi were studied and their systematic place was determined (V.I. Kudryavtsev, 1954; Lodder, 1970).

The obtained results and their analysis

When the drug prepared from the epiphytic microflora of tomato and cucumber vegetables was observed under a microscope, small oval-shaped, spore-forming cells were seen.

Spores are spherical, surrounded by a smooth shell, and during their growth, they were observed to directly transform into vegetative cells. The epiphyte microflora of tomato and cucumber is rich in a wide variety of fungi, including sporogenous and asporogenous forms. When observed under the microscope, oval budding cells were clearly visible. When cultured on wort-agar nutrient medium in a 28oC thermostat, diverse colonies appeared within 5 days (Fig. 1, A, B).


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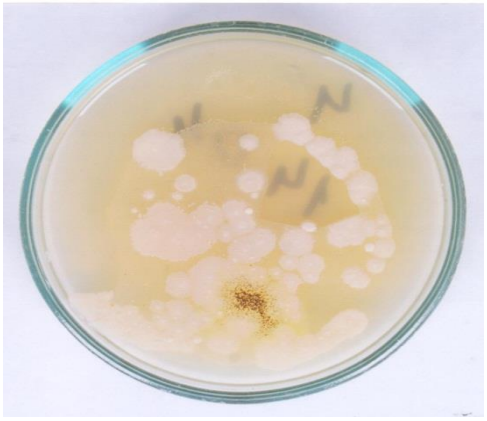
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Figure 1. Appearance of colonies grown on wort agar medium:
A-small, dense, bulging surface (tomato) and B-large, spreading colonies (cucumber).

Colonies vary in shape and color, some with smooth edges, some with folds, some with smooth shiny, some without shiny, raised and spreading forms. Colonies are white, yellow, light pink, light brown, light yellow, and gray in color with unevenly folded edges. When a fixed and stained preparation was prepared from these colonies and viewed under a microscope, a large number of round, oval-shaped cells were clearly visible (Fig. 2, A, B).


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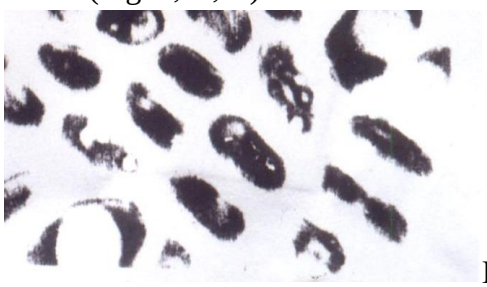
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Figure 2. Microscopic view of fixed and stained preparations of colonies: A-tomato, B-cucumber.

Magnification 1000.

There are many types of microorganisms on the surface of tomato and cucumber vegetables, and not all of them participate in quality deterioration. There are many types of spore-forming and non-spore-forming yeasts on the surface of freshly picked tomato and cucumber vegetables [1, 3].

In this study, a pure culture of light yellow, brown, light pink, and dark colored fungi was isolated from the epiphytic microflora of tomato and cucumber vegetables (Fig. 3, A, B). Among them, Saccharomyces sp., Hansenula sp., Candida sp., Torulopsis sp., Rhodotorula sp. and Trichosporon sp. It was found that yeast species such as Especially Saccharomyces sp.

Yeast fungi are common in tomato epiphytic microflora, while in cucumber epiphytic microflora Saccharomyces sp. along with Candida sp. and Torulopsis sp. it was found that it occurs a lot (Fig. 3, A, B).


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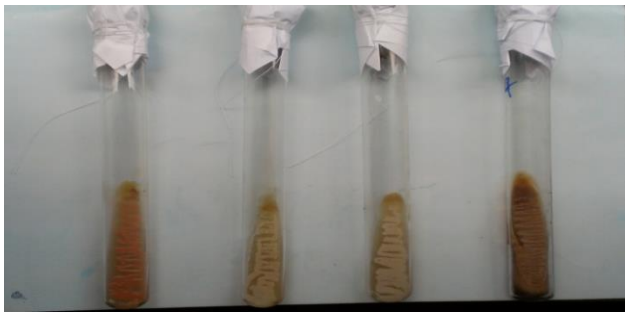
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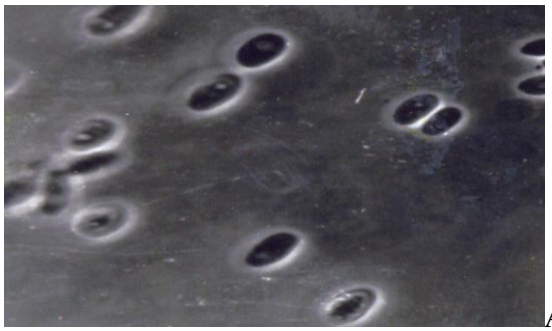
Figure 3 A, B. Pure culture of yeast isolated in test tubes (A-tomato), (B-cucumber).

When a microbiological preparation was prepared from fungal cultures and viewed under a microscope, it was found that it consisted of elongated oval-shaped cells, characteristic of yeast fungi, and there were many spore cells among them (Fig. 4, A, B).

In further research, the morphological (shape, size, arrangement, structure, etc.), cultural (cultivation of microorganisms in specific nutrient media), physiological (types of nutrition and respiration, etc.) characteristics of these yeast cells were determined

biochemical and several other properties were studied. The biological origin and similarities of microorganisms were compared, and their systematic place was determined based on the obtained results.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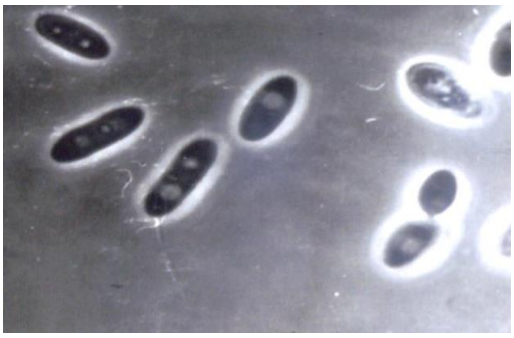
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Figure 4. Microscopic view of fixed and stained preparations of colonies: A-tomato, B-cucumber. Magnification 680.

Thus, the epiphytic microflora of tomatoes and cucumbers is rich in yeast fungi, and when observed under a microscope, it was found that they consist of round and oval cells, and some cells are budded. Among fungi, non-spore-forming species (*Candida sp., Torulopsis sp*.) were less common than spore-forming species (*Saccharomyces sp. and Hansenula sp*.).

Conclusions

Pure cultures of yeasts belonging to different families were isolated from the epiphytic microflora of tomato and cucumber vegetables. Among them, *Saccharomyces* sp. and *Hansenula sp., Candida sp., Torulopsis sp., Rhodotorula sp. and Trichosporon sp.* It was found that yeast species such as In tomato epiphytic microflora, Saccharomyces sp. abundance of yeasts, Hansenula sp., Rhodotorula sp. low incidence of fungi, as well as Saccharomyces sp. in

epiphytic microflora of cucumber. along with Candida sp. and Torulopsis sp. it was known that many fungi were found.

References

1. Ilyashenko N.K., Beteva E.A. Mikrobiologiya pishchevyx proizvodstv.- M.: Koloc. 2008. - 412 p.
2. Practical microbiology. Pod ed. A.I. Netrusova. M.: ACADEMA. 2005.
3. Abdullabekova, D.A. Issledovanie biotechnologicheskih svoystv drozjei-sakaromitsev / D.A. Abdullabekova, E.S. Magomedova // Vinodelie i vinogradstvo. - 2009. - No. 5. - S. 16-17.
4. L.B. Borisov. Medical microbiology, virology and immunology. — M.: Medical Information Agency (MIA), 2005. — S. 154-156.
5. Galynkin V. A., Zaikina N. A., Kocherovets V. I. i dr. Osnovy farmatsevticheskoy microbiologii: uchebnoe posobie dlya sistemy poslevuzovskogo obrazovaniya. — S.-P.: Prospekt nauki, 2008.- 288 p.
6. Calderone R.A., Cihlar R.L. Fungal Pathogenesis. Principles and Clinical Applications. New York: Marcel Dekker, Inc., 2002.
7. Reiss E., Shadomy H.J., Marshall Lyon III G. Fundamental Medical Mycology. New Jersey: Willy Blackwell, 2012.