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NEW STRAINS OF FUNGI OF GENUS *TRICHODERMA*, ALLOCATED FROM THE RHIZOSPHERE OF CUCUMBERS AND POTATOES GROWING IN THE ALMATY REGION

Abstract. This paper presents the results of a microbiological analysis of soil samples taken from the rhizosphere of potato of sort "*Gala*" andrhizosphere of cucumbers of *"Buyan F1*"sort,cultivated in the Almaty region of Kazakhstan for the presence of soil saprophytic fungi of the genus «*Trichoderma»*. A morphological-microscopic description of two new strains of «*Trichoderma»* fungus is given. According to the characteristic morphological and microscopic features, the isolates obtained from the soil of the rhizosphere of the potato of sort "*Gala"* and cucumbers of sort "*Buyan F1*" were accordingly attributed to the species «*Trichoderma asperellum»* and «*Trichoderma album»*.

Keywords: rhizosphere, cucumber, potato, strain,fungi, *Trichoderma*.

One of the important areas of modern research is the increase in the productivity of plants. This indicator depends on the species and the conditions of growing plants. Soil microorganisms have a great influence on the growth and development of plants. It should be noted that among them there are both phytopathogens having a negative effect, and microorganisms - antagonists, which have a positive effect on the plant organism [1-3].

One of the most common microscopic fungi on the planet is the fungi of the genus *Trichoderma*, suppressing more than 60 species of plant pathogens [1-3].

Very promising use of preparations based on fungi of the genus *Trichoderma* in the fight against root rot. Root rot is currently a scourge of fields used for cereals, legumes, vegetable, technical and other crops. Particularly dangerous are fusarium root rot, the causative agents of which are fungi of the genus *Fusarium*. They infect both cucumbers and potatoes throughout the entire vegetation period [4-6]. Some species of *Fusarium* produce dangerous mycotoxins, infecting the grain, causing severe diseases of people and animals [7].

In addition to *Fusarium* rot, great harm is caused by white rot, the causative agent of *Sclerotinia-sclerotiorum*. The disease affects plants of both open and protected soil. It appears on all plant organs in all phases of their development. It causes death of seedlings, wilting of adult plants, decay of fruits [8].

In the late stages of growth and development of the plant, it is affected by an alternaria, the causative agent of which is *Alternaria spp.* Infection of crops with an alternaria begins with the spores left on the stubble. Infection can also occur during the vegetative period [9].

It should also be noted such a disease as late blight, the causative agent of which is *Phytophthorainfestans* [10].

Phytophthora, like any fungus, consists of mycelium, sporangium and conidia. Mycelium has the form of a web of white color. It lives and develops in the tissues of plants. The fungus multiplies by spores and asexual means - conidia. Spores are formed in sporangia. After the spores mature, the membrane of the sporangium bursts, and they come out. Further, spread with water, get on plants and start a new life cycle.

The purpose of this work was to identify fungi of the genus *Trichoderma* in the rhizosphere of cucumbers of the brand "*Buyan F1*" and potato varieties "*Gala*", growing in the Almaty region for further use as agents of biological control of phytopathogens affecting vegetable crops.

Materials and methods. The soil samples obtained in 2017 from the rhizosphere of "*Buyan F1"* cucumbers and "*Gala*" potato growing in the «Galym» farm of the Sarkand district of the Almaty region served as the object of the study.

The isolation of fungi from soil samples was carried out by methods commonly used in microbiology [11].

The soil suspension was plated on a Czapek nutrient medium in Petri dishes.

The composition of the Czapek medium (g/l): sucrose – 20.0; $NaNO_3$ – 2.0; KH_2PO_4 – 1.0; $MgSO_4 \cdot 7H_2O$ – 0.5; KCl – 0.5; $FeSO_4 \cdot H_2O$ – 0.01; agar – 20.0.

The fungal colonies were isolated from petri dishes on a sloping nutrient medium of the same composition. A pure culture of the fungus (strain) was obtained after a number of passages.

Morphological and microscopic studies of isolated strains were carried out on the Czapek medium, identification was carried out according to the corresponding determinants [5, 10].

Results and discussions. Microbiological analysis of soil samples from the potato and cucumber rhizosphere was carried out in the "Galym" farm of Sarkand district, Almaty region. From the rhizosphere of the potato "*Gala"* and cucumbers "*Buyan F1*" there was isolated one isolate of the fungus genus – *Trichoderma.*

Morphological and microscopic characteristics of the isolate isolated from the rhizosphere of the "*Gala*" carofel.

On Czapek's medium, a powerful, smooth, radially divergent substratum mycelium of gray color first develops. The grayish shade of the mycelium is created by a certain elevation of mycelia to the surface of the substrate. For two days, the average radius of the colony reaches 3-4 cm. The average diameter of the vegetative hypha is 8-15 microns. The surface of the fungal colony before the formation of the aerial mycelium is even, uniformly fibrous, diverging from the center of the sowing to the periphery. 30-35 hours after sowing, a uniform aerial mycelium of a cotton-like structure, grayish-white, rises from substrate mycelia. The aerial mycelium gazon develops with a slight (2-3 mm) lag from the edge of the colonies formed by the substrate mycelium.

The onset of conidia occurs gradually within 70-80 hours after inoculation with a culture content in a thermostat at 27 °C. Conidation occurs in the entire surface of the lawn at first in the form of small scattered glomeruli 3-5 mm in size, and then they expand to form a continuous conidial lawn.

The color of the conidial lawn changes from matte to a light green hue at young age to matt dark green in adulthood.

On cone-shaped water, the conidiophores rise upward, regardless of the position of vegetative mycelial hyphae, in mature form and their height is about 40-50 microns on average; they are branched dichotomically or cruciform, the diameter of the middle part is 5-6 microns. The lateral branches diverge from the main branch of the conidiophore by tiers and the lower lateral branches can give secondary branches, at the end of which the whiskers are located sterigmata not more than 4 pieces in one place. Sterigmata are keg-shaped, the length on average is 5 microns. At the end of the sterigmata, conidial heads are formed, they are spherical, up to 10 microns in diameter. In the heads under the microscope, conidiespores are looked through, which easily decompose during maturation, especially at high humidity. The spores are spherical and rarely, with a single examination pale green, but in mass dark green, diameter 2.5-3.5 microns.

a *b*

Picture 1 – Culture of the «*Trichodermaasperellum»* fungus:
a – growth on Czapek's nutrient medium; *b* – microstructure

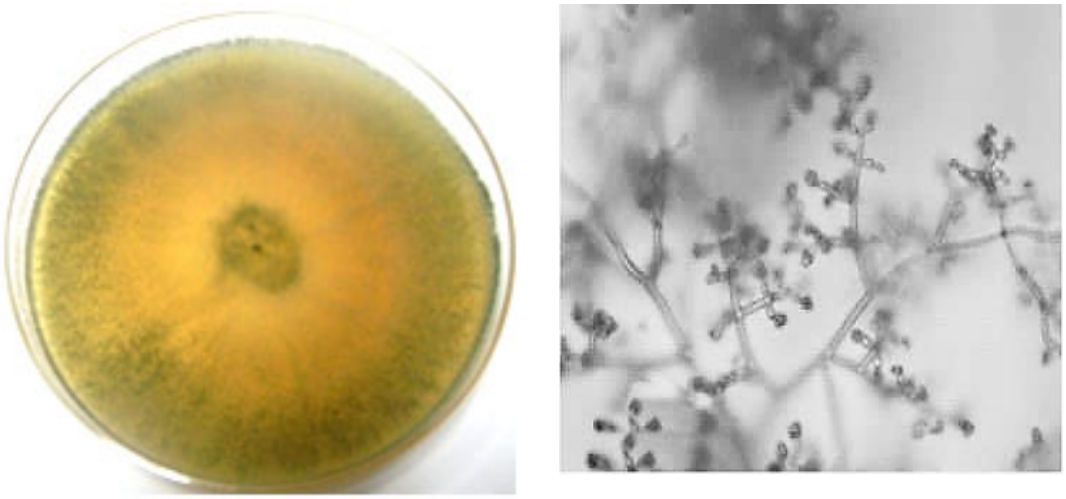
There are intercalary chlamydospores, spherical, smooth with a diameter of 8-10 microns. The reverse side of the colony is not colored. The mature culture of this fungus is a specific mushroom smell.

According to morphological and microscopic features, the isolate is referred to the species *Trichodermaasperellum* (Picture 1).

Morphological and microscopic characteristics of the isolate isolated from the rhizosphere of the cucumber of "*Buyan F1*"grade.

On Czapek's medium, an abundant colorless (glassy) mycelium first develops, which extends radially from the sowing point, forming a flat colony of fibrous structure. The average diameter of the vegetative hypha is 9-12 microns. For two days, the average radius of the colonies reaches only 1-1.5 cm, and by the beginning of the second week of growth it is 3-4 cm. At this time, separate white bundles of the aerial mycelium appear on the surface of the fungal colony, resembling cumulus clouds. The size of these beams is initially from 2 to 5 mm, then they gradually growing together, merge with one another, forming a continuous, bumpy mushroom lawn. The aerial mycelium lags 10-15 mm behind the substrate in its development.

By the middle of the second week of growth on the surface of the mushroom lawn, small, rare, white with a yellow hue of grains appear (the beginning of conidia formation), which gradually turn to the egg-yellow and then the greenish-yellow color by the end of the second week of growth. In comparison with other species of the genus, the growth and development of this species is much slower.



a *b*

Picture 2 – Culture of the *Trichoderma album*fungus:
a – growth on Czapek's nutrient medium; б – microstructure

On congeneric water, the conidiophores are well distinguishable, they rise from the branches of the aerial mycelium and have a height of 25-30 microns, and the diameter of the middle part is 5-6 microns. Branching dichotomeric, most often, cruciform. At the ends of the branches sterigmataare placed, their number is not more than 5, and the dimensions may be different, but not more than 5 microns in length. On the tops of the sterigma there are colorless conidial heads of round form, consisting of a conidia-con cluster of glued together mucous substances. These conidial heads outwardly resemble berries of blackberries and have a size of 12-15 microns. Conidies in the heads under the microscope are well seen, individually they are almost colorless, but they refract light, round, oval or ovate, often at one end somewhat pointed, smooth, with an average value of 4x3.5 microns.

Chlamydospores are rare, intercalary, round, smooth-walled, 6-8 microns in diameter. During the development of the fungus, the pigment is not released into the substrate. However, the reverse side of the colony is yellow. According to morphological and microscopic features, the isolate is referred to the *Trichoderma album* (Picture 2).

Thus, two new strains of the *Trichoderma* fungus are isolated from the rhizosphere of the "*Gala*" potato and the "*Buyan F1*" cucumbers cultivated in the Almaty region of Kazakhstan, classified according to morphological and microscopic characteristics as *Trichodermaasperellum* and *Trichoderma album.* It is planned to study the antagonistic activity of new strains against pathogens of potato and cucumber diseases with the aim of developing effective domestic biopreparations for plant protection on their basis.

REFERENCES

[1] Alimova F.K. Nekotorye voprosy primenenija preparatov na osnove gribov roda Trichoderma v sel'skom hozjajstve // AGROXII nauchno-prakticheskij zhurnal. 2006. N 4-6. P. 18-21 (in Russ.).

[2] Ramaraju Cherkupally, Hindumathi Amballa, Bhumi Narasimha Reddy. In Vitro Antagonistic activity of Trichoderma and Penicillium species against Macrophominaphaseolina (Tassi) goid // Annals of Biological Research. 2016. Vol. 7, N 9. P. 34-38.

[3] Khaledi N., Taheri P. Biocontrol mechanisms of *Trichoderma harzianum* against soybean charcoal rot caused by Macrophominaphaseolina // Journal of plant protection research. 2016. Vol. 56, N 1. P. 21-31.

[4] Stefańczyk E., Sobkowiak S., Brylińska M., Śliwka J. Diversity of Fusarium spp. associated with dry rot of potato tubers in Poland // Eur J Plant Pathol. 2016. N 145. P. 871-884.

[5] Vatchev T.D. Fusarium root and stem rot of greenhouse cucumber: aerial dispersal of inoculum // Bulgarian Journal of Agricultural Science. 2015. Vol. 21, N 3. P. 650-654.

[6] Babychan M., Simon S. Efficacy of *Trichoderma spp.* against Fusarium oxysporum f. sp. lycopersici. (FOL) infecting pre-and post-seedling of tomato // Journal of Pharmacognosy and Phytochemistry. 2017. Vol. 6, N 4. P. 616-619.

[7] Guerre P. Fusariotoxins in Avian Species: Toxicokinetics, Metabolism and Persistence in Tissues // Toxins. 2015. N 7. P. 2289-2305.

[8] Purdy L.H. Sclerotiniasclerotiorum: History, Diseases and Symptomatology, Host Range, Geographic Distribution, and Impact. 1979. Vol. 69, N 8. P. 875-880.

[9] Gilardi G., GullinoM.L., Garibaldi A. Occurrence of Alternaria spp. In the seeds of basil and its pathogenicity // Journal of Plant Pathology // Center of for Agro-Environmental Innovation (AGROINNOVA), University of Torino, Via Leonardo da Vinci 44, 10095 Grugliasco (TO), Italy, 2013, 95(1). P. 41-47.

[10] Olanya O.M., Larkin R.P., Honeycutt C.W. Incidence of Phytophthorainfestans (Mont.) de Bary on potato and tomato in Maine, 2006–2010 // Journal of plant protection research. 2015. Vol. 55, N 1. P. 58-68

[11] Bilaj V.I. Izuchenie jelementov mofologii gribov. Metody jeksperimental'noj mikologii. Kiev: Naukova Dumka, 1982. P. 25-75 (in Russ.).

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АЛМАТЫ ОБЛЫСЫНДА ӨСЕТІН КАРТОП ПЕН ҚИЯР РИЗОСФЕРАСЫНАН БӨЛІНІП АЛЫНҒАН *TRICHODERMA* ТЕКТЕС САҢЫРАУҚҰЛАҚТАРДЫҢ ЖАҢА ШТАММДАРЫ

Аннотация. Бұл жұмыста Қазақстанның Алматы облысында өсірілетін, картоп *«Гала»* және қияр *«F1 Буян»* ризосферасының топырағынан алынған жинақта *Trichoderma* тегінің сапрофиттік саңырауқұлақтарының болу үлгілерін микробиологиялық талдау нәтижелері ұсынылған. Екі *Trichoderma* саңырауқұлақтарының жаңа штаммдарына микроскопиялық морфологиялық сипаттамасы берілген. *«Гала»* картоп пен *«F1 Буян»* қиярдын ризосфера топырағынан ажыратып алынған, морфологиялық және микроскопиялық сипатына тән, тиісінше *Trichoderma asperellum* және *Trichodermaalbum* түрлеріне жатқызылды.

Қияр*«Буян F1»*мен *«Гала»* картобының ризосферасынан алынған, *Trichoderma* тектес саңырауқұлақтар өсіріндісі туралы деп, пікір ұсынылды. Бұл зерттеу ең көп таралған микроскопиялық саңырауқұлақтар тегі - *Trichoderma* тегіне арналады. Тамыр шірік қоздырғыштарына қарсы-антагонизм танытатын *Trichoderma* саңырауқұлақ өндіру үшін эксперименттік әдістері жасалды. Алматы облысында өсіп келе жатқан көкөніс дақылдары ризосфера топырағынан, ең агрессивті антагонистер бөлініп алынды.

Түйін сөздер: ризосфера, қияр, картоп, штамм, саңырауқұлақтар, *Trichoderma.*

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НОВЫЕ ШТАММЫ ГРИБОВ РОДА *TRICHODERMA*, ВЫДЕЛЕННЫЕ ИЗ РИЗОСФЕРЫ ОГУРЦОВ И КАРТОФЕЛЯ, ПРОИЗРАСТАЮЩИХ В АЛМАТИНСКОЙ ОБЛАСТИ

Аннотация. В настоящей работе представлены результаты микробиологического анализа образцов почвы, взятых из ризосферы картофеля сорта «*Гала*» и огурцов сорта «*Буян F1*», культивируемых в Алматинской области Казахстана на наличие почвенных сапрофитных грибов рода *Trichoderma*. Дано морфолого-микроскопическое описание двух новых штаммов гриба *Trichoderma*. По характерным морфологическим и микроскопическим признакам изоляты, полученные из почвы ризосферы картофеля сорта «*Гала*» и огурцов сорта «*Буян F1*», были соответственно отнесены к видам *Trichoderma asperellum* и *Trichodermaalbum*.

Ключевые слова: ризосфера, огурцы, картофель, штамм, грибы, *Trichoderma.*

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