PARASITIC AND SAPROPHYTIC MICROMYCETES IN SOIL OF GREENHOUSES DESTINATED TO CULTIVATION WITH TOMATOES (II)

MICROMICETE PARAZITE ŞI SAPROFITE DIN SOLUL SERELOR DESTINAT CULTIVĂRII CU TOMATE

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Abstract. *This work performs the results of the observations made upon the spectre of parasitic and saprophytic micromycetes in soil destined to the cultivation with tomatoes.Its were been isolated and identificated species of followed genus: Fusarium, Gliocladium, Cladosporium, Aspergillus, Penicillium, Trichoderma, Acremoniella, Cylindrocarpon, Verticillium and colonies of steril mycelium.. It was been remark the massive occurrence (46,2% of total) of Penicillium species.*

The study of micromycetas from soil is relly interesting and useful at the some time taking into account the fact that new plants are planting which in first phasez of development are very sensible. The presence of parasitic micromycetas may compromise the culturebeing necessary a new dezinfection of the soil and a replantation which modifies the period of development of plants delayng the valorification of obtained production.

MATERIAL AND METHOD

Before planting the tomatoes plants, have been gathered tests from soil which were brought to lab for analyses. In order to determine micromycetas from soil the petries were sterilized in which was put Czapek mediulm which has the following composition: NaNO3 - 3 g ; K2 HPO4 - 1 g ;MgSO4 .7 H2O - 0,5 g ; KCl - 0,5 g ; FeSO4 .7H2O - 0,01 g; Sucroze - 30 g; Agar -15 g; distiled water -1000 ml. The petries with medium were sterilized. The sowing of these has been made on 14-th February 2007 and have been thermostated at 220 C. Two dillution have been made: 10-4 şi 10-6, five petries for each test and dillution. At the appearance of micelions colonies (21.02.2007), these have been numbered and photographied.

RESULTS AND DISCUSSIONS

After counting the colonies, we found the following rezults:

- at test I, at dillution 10-4 at V-1- have been registred an average of 88,00 germs /g solil and at dillution 10-6 at V-1 an average 32,000 germs /g solil;

The numbering of the colonies has been made on 21-st February 2007- at tests I and II 10^{-4} V-1 an average on 5 repetitions - 96000 germs/g soil.
10^{-6} V-1 an average on 5 repetitions - 50000 germs/g soil

10^{-4} V-2 an average on 5 repetitions - 99000 germs/g soil
10^{-6} V-2 an average on 5 repetitions - 26000 germs/g soil

1. ACREMONIELLA ATRA Sacc. Syll. Fung., IV, p. 302 (1886); Ellis, Dematiaceous Hyphomycetes, p. 79, fig. 44 (1971).

The colony developed on Czapek medium at maturity is coloured in light brown. The talus fibrous is it and superficial and imers, is of 2-7 µm width. The conidiophores are simple or branches, with smooth walls and have 100 x 4-8 µm. The conidias which forms at the end of one short branch is nonseptate, oval, slightly yellow, smooth with 2 walls of 20-30 x 15-25 µm. The tomatoes soil is a new host for the country.

2. *ASPERGILLUS FLAVUS* Link., Observationes, p. 16 (1809); Raper end Fennel, The Genus Aspergillus, p. 361, (1965);

The colony developed on Czapek medium agar are well delimited and colours the medium on verso colonies, in yellow. The conidiophores are straight of 400-500 x 5 µm with a bladder ending of 25-30 µm in diameter, which sometimes prezents a single row of fialides of 12 x 3 µm that eliminates the conidiouses globose, which are slightly yellow, smooth, of 2,5 x 3,5 µm in diameter.The tomatoes soil is a new host for the country.

3. *ASPERGILLUS FUNICULOSUS* Smith, Brit. Mycol. Soc., XXXIX, p.111(1956); Raper end Fennel, The Genus Aspergillus, p. 440, fig. 91 F, H (1965);

The colonies of this fungus are green-yellow, granular, with a white margin, with the surface funiculosa. The bach side of the colony is olive in colour with reddishspots on. The heads sporipheric are globose of up to 120-140 µm in diameter. The miceylum, has 4-6 µm in diameter, and sporangiophorous ends with a sphere of 15 µm in diameter, on which we can find fialides tall of 6-7 X 2,5 µm, which eliminates the conidiouses globose of, 3-5 µm. The tomatoes soil is a new host for the country.

4. *CLADOSPORIUM HERBARUM* Link ex. Gray(1821); Domsch end Gams, Pilze aus Agrarböden, p. 28 (1970).

The colonies developed by this micromyceta are blach and the medium on verso is dark grey. On the surface of the colony are straight conidiophores rarely with branches, septed , brown-olive with diameter of 5-7,5 µm. The conidiouses appear at extremity are oval, unicelular, cyllindric-elliptical, sometimes with 2 cells and at lest throttle in front the sept. The tomatoes soil is a new host, the fungus being qnoted as saprophitic.

5. *CYLINDROCARPON CANDIDUM* var. *majus* Wollenweber, J. Gilman, A Manual of Soil Fungi, p. 396 (1957);

The micromyceta develops on the medium a colony white and circular on which appear microconydiouses oval-cylinders free or in false heads sporipheric of 4-12 x 2,5 µm that nonseptate or of 9-20 x 3 µm, the bicelulars. The macroconidias are cylindric-clavariforme, slightly curved, ellipsoidales or obtuse at base, with multiple transversal walls(5-7).The conidiophores at the beginning

are simple and in the end have branches arranged in the verticils. The fungus is qnotqd just once from mountain soils.

6. *FUSARIUM SP.*

The micromyceta develops on the medium a fluffy micellium of white colour at the beginning and then pink, colouring the medium under the colony in redalish shades. The conidiophores are branches and sustain the heads sporipheric made of many conydiouses with pointed heads and many transversal walls, conydiouses of *Fusarium.* The determination of the specie hasn't been done because is necessary smashing on standard mediums for *Fusarium* type. The fungus is common on cultivated soils.

7. GLIOCLADIUM DELIQUESCENS Sopp., Monogr. Der Pilzgruppe, p.89 (1912); Raper and Thom, p. 686(1968).

The micromyceta develops on Czapek medium a colony, at the beginning made up of sterile hifes, and then in the moments the fructify**,** the colony becomes dark green and the medium under it is coloured. The conidiophores are easy to notice and have 100-200 x 10 µm. The fructifications are many levels, branches, secondary branches, metulas, fialides and sporipheric head globols from which the conydiouses can hardly detach even at heating the microscophic preparation. The primary branches have 15 x 3-3,5 µm, the secondary branches have 13-15 x 3 µm, the metulas 8-9 x 2 µm, the fialides 6-8 x 2-2,5 µm, and the conidias are elliptical, light green with smooth wall of 3 x 2-2,5 µm. These elements remain crowded being densed by a sticky exudat. The micromyceta has been qnoted once from the soil with *Hippophae.*

8. PENICILLIUM BREVI-COMPACTUM Dierckx,Soc. Scien. Brux. 25, p.88(1901);Gilman,

A Manual of Soil Fungi, p. 255 (1957); Raper and Thom, p. 407-409, fig.106,(1968). The colonies that appear on the medium are limited, velvety, green-grey with the medium under the colony yellow-grey. The diameter of the colony is 2-3 cm after 10-12 days from its appearance. The conidiophores are variable in lenght and shorter than at other species *Penicillium,* compact, forming zones fares on the surface of the colony which has the center raised and spots slightly coloured in yellow. Under the colony the micellium is coloured in yellow. The conidiophores have 300 x 3,5µm, rarley with branches with smooth walls. The branchets are of 20 x 3 the metulas 12 x 2,5µm, the fialides 10 x 2,5µm, and eliminate the smooth conidias, ovate to subglobose of, 2,5 x 2,5-3µm. Micromyceta has been qnoted from the soils cultivated with wheat, maise, salad and beech wood kept in the soils.

9. *PENICILLIUM CORYOPHILUM* Dierckx, in Soc. Sci. Brux. XXV, p. 86 (1901);Raper and Thom, p. 341, fig. 91 (1968).

The colonies developed on Czapek medium agar, have 2,5-3 cm in diameter at 10 days after their appearance. The surface of the colonies is velvety, wrinkled, of green- blue colour with small spots and with the back side sightly coloured in brown. The penicillies are variable, lop-sided, with monoverticilate structures, with 2-3 metulas of 15 x 3 µm, the fialides of 10-12 x 2,5 µm that eliminate the

conidias subglobose of 2,5 µm with smooth walls in divergent chains. The fungus has been qnoted from soil with salad, and from opium poppy and potatoes tuberculas.

10. PENICILLIUM FREQUENTANS Westling, Arkiv för Botanik, XI, 58, p.133 (1911); Gilman, A Manual of Soil Fungi, p. 241 (1957); Domsch end Gams, Pilze aus Agrar., p. 103 (1970).

The colonies that appear on Czapek medium agar have rays, are velvety and green-blue in colour. The conidiophores have 200-300 x 3 µm lenght. Under the colony, the medium is slightly coloured in brown. The conidyas chains come from fialides of 7,5-10 x 2,5µm, and the conidyas are spheric, smooth of de 2,5-4 µm in diameter. Micromyceta has been qnoted from soil cultivated with weat and frezias.

11. *PENICILLIUM FUNICULOSUM* Thom, in U.S. Dept. Agr., Bur. Anim. Ind., Bul. 118, p. 69(1910); Gilman, A Manual of Soil Fungi, p. 280 (1957); Raper and Thom, p. 616 (1968);

The colonies that appear on Czapek medium agar have a funiculose surface colouring the medium in dark red. The conidiophores that appear on the medium are grouped and are short of de 20-80 µm. The heads sporipheric have 3 floors with fialides of 10-12 x 2-3 µm that eliminate elliptical conidyas, smooth, green of 3 x 2-3 µm in colums. Micromyceta has been qnoted from soil with salad and pine-tree wood kept in the soil.

12. *PENICILLIUM LILACINUM* Thom,U.S.Dept. Agr., Bur. Anim. 118, p. 73 (1910); Raper and Thom, p. 285, (1968);

The colonies that appear on Czapek medium agar have the surface white at the beginning, floccose, after begun their fructifyed gets to lilac, without colouring the medium under the colony. The heads sporipheric are found at a light of 100 µm, and the fialides of 12 x 3 µm, eliminate the conidyas of 3-5 x 3 µm, elliptical or oval. Micromyceta is qnoted from the soils cultivated with wheat, maise, frezias and salad.

13. *PENICILLIUM PALLIDUM* Smith, in Bot. Mycol. Soc. Trans. XVIII, 88-89, Pl. IV, fig. 1, 2 (1933); Raper and Thom, p. 459, 460, fig. 120 A, B (1968);

The colonies that develop on Czapek medium agar grow fast (6-7 cm in 10-14 days), have a funiculose surface because of the groups of conidiophores coloured in beije, without exudat. The penicillias are lop-sided with thick walls, metulas of per 12 x 2,5 µm and fialides of 11-12 x 2 µm that eliminate the long conidyas, smooth, of 3-4 x 2 µm. The tomatoes soil is a new host for the country.

14. *PENICILLIUM RUGULOSUM* Thom, in U.S. Dept. Agr., Bur. Anim. Ind., Bul. 118, p. 60-61, fig. 21 (1910); Raper and Thom, The Penicillia p. 648-650, fig. 164-A, B, C (1968);

The colonies that develop on Czapek medium agar can reach 2,5 cm at two weeks from their appearance do, are flufly, of dark green colour and a white margin. The conidiophores have 200 x 2,5 µm with fialides of 9-12 x 2 µm, that eliminate the elliptical conidyas green arranged in long chains, divergent. Micromyceta is a qnoted fron soil cultivated with wheat maise and frezias.

15. ***PENICILLIUM TERRESTRE*** Jensen, in Cornell University Exp. Sta. Bul. 315, p. 486, (1912); Raper and Thom, The Penicillia p. 450-452, fig. 116 - A, B, fig. 117 (1968);

The colonies of micromyceta develop on Czapek medium agar under a circular form of dark green in colour, and presence characteristic conidiophores with thick walls. The vegetative hyphae , the tall have 2-5µm in diameter and the conidiophores that are 70-300 µm high, are septate with branches that end with metulas of 10-15 µm, and fialides de 7-10 µm. The conidyas that are spheric, hialines are grouped in long chains and are 2-3 µm, in diameter. Micromyceta is qnoted from soils from the mountain.

16. ***PENICILLIUM VARIABILE*** Sopp, Monogr., p.169, (1912); Raper and Thom,The Penicillia p. 642, fig. 163 (1968);

The colonies reach 2-3 cm in diameter on Czapek medium agar at two weeks from their appearance. The surface of the colony is velvety-granulated with micellium that is 200 µm height. The colour of the colony varies from orange to pink and then carmine. On the back side the medium colours in pink. The conidiophores septed, brown with smooth walls, have the verticille of 2-4 metulas and cylindric fialides that free the elliptical conidias of 3-4 µm. The fungus is qnoted from montaineous and mine soils.

17. TRICHODERMA GLAUCUM Abbott, Tax. St. of soil fungi (1926);Gilman, A Manual of Soil Fungi, p. 213 (1957);

Micromyceta forms on the medium a colony which is diffuse and extends very rapiddly, of yellow colour with shades in the sporiphaeric area. The tallus is 3-6 µm, is more-septation and on it raises the conidiophores irregular branched of. The heads sporipheric have 7,5-10 µm and the conidyas are smooth, hialine, oval of 4-5 x 3µm. The fungus has been qnoted from soils cultivated with wheat, mayse and *Chrysanthemum*.

18. ***VERTICILLIUM TENERUM*** (Nees ex Pers.) Link., J.Gilman, A Manual of Soil Fungi, p. 304 (1957).

Micromyceta develops a colony covered bya delicate micellium of brick-coloured. The conidiophores are dicothomic-branched, of yellow-reddish shades and of 2-3µm in diameter. The conidyas very small, numerouses, brick-coloured have 2-3 x 2 µm. Micromyceta has been qnoted from soils of wheat and maise. We attach the photos and the microscophic lamellas have been included in micologic Herbal of Moldavia „C. Sandu-Ville".

CONCLUSIONS

1. The study of micromycetas from soil is very useful taking into account the fact that follows the plantation of rasads which at first phases of development , are extremely sensible.

2. The presence of parasitic micromycetas has an economic implication because it can compromise the culture and so a new disinfection of the soil is

needed and of course another replantation which modifiens the period of development of plants, delayning the valorification of obtained production.

3.The analyses of the tests from soil harvested in June 2007 proves the fact that the presence of high temperatures and of more developed plants made that the spectrum of micromycetas from soil to modify both in quantily and of variability of isolated species. It is noticed the presence of new species for România or qnoted for the first time in the soil cultivated with tomatoes like: Cladosporium lignicolum, Paecilomyces marquandii, Ceratocystis paradoxa, Verticillium lateritium, Scopulariopsis brevicaulis, Penicillium ochraceum.

4.Out of the sum of izolated species, 16,2% represent micromycetes new for our country or qnoted for the first time in soil.

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