NEW PARASITIC AND SAPROPHYTIC MICROMYCETES ON ORNAMENTALS PLANTS IN MOLDOVIA

Viorica IACOB[1], Eugen ULEA[1]
E-mail: iacobviorica@gmail.com

Abstract

As a result of the mycological researches during 2009-2010 on different ornamentals plants, the authors pointed out on new micromycetes for Romania, new host-plants for already known micromycetes and rarely described micromycetes in Moldavia.
The authors observed the frequency of the pathogenical agents on plants, on the cultivated flowers in green houses, on trees and ornamental bushes and on weeds from filed cultures. 2 new micromycetes for Romania, 2 new host-plants for the central part of Moldavia, 13 new host-plants already known micromycetes for Romania and 5 micromycetes rarely described in Romania are reported.

Key words: new micromycetes, ornamental plants, Moldavia

Mycological research undertaken during 2009 and 2010 revealed the presence of new or already identified micromycetes genera on ornamental plants from the central area of Moldova.

Monitoring the occurrence of crops, bushes, trees, ornamental and spontaneous plants diseases is made every year to identify micromycetes that can pass from spontaneous flora on cultivated plants and/or saprophytic micromycetes that under specific environmental conditions can become parasitic.

MATERIAL AND METHOD

Horticulture plants tucked under observation between 2009 and 2010 presented many classic symptoms of diseases. The infected material was prevailed from field, brought in the laboratory where supported special mycology tests until the micromycetes genera were determinate. The microscopic samples and the attack symptoms were photographed for a better exemplification of the pathogen attack.

RESULTS AND DISCUSSIONS

As a result of the researches were signalized saprophytic and parasitic micro funguses which we present the mycological files.

1. *Stemphylium polymorphum* Bonorden H.F., Handb., p. 88 (1851); Thüm., Litor. I, no.10 (1880); Sacc., Syll. IV, p. 501 (1886); Migula W., Kr. Fl. Bd. III, Pilze 4 teil 2 ab., p. 397 (1934). *Convolvulus tricolor* L. stems collected in Iasi on 1.XI.2010 shows small black spots; each spot consist from 5-7 typically conidiophores with 30 x 6.5 µm length. On conidiophores are present black conidia with 2-3 cross walls. The conidia dimensions are 44 x 25 µm. The isolated fungus and the host plant are new for Romania.

2. *Pestalozzia cupressina* Niessl., Hedwigia p. 188 (1883); Sacc. Syll. Fung. III, p. 792 (1884); Allescher A., Rab. Krypt. Fl., Die Pilze, VII Abt Fungi imperfecti p. 688 (1903).

Dry leaves and branches of *Cupressocyparis leilandii* harvested in Iasi on 10.II.2011 showed necrotic areas with small black spots. These are formed from conidia camps, which are rising through the periderm. The periderm will finally appear whitish.

Spores elongated, black-brown, have two cross walls and measure 18-20 x 8 µm.

This microfungus is new for Romania mycoflora and it was for sure imported with the plant seeds.

3. *Sphaerella adusta* Niessl., Oesterr. Bot. Zeitsch (1875); Sacc., Syll I, p. 511 (1882); G. Winter, Rab. Kr. Fl. Pilze II ab, p. 374 (1887); W. Migula, Kr, Fl. Bd. III , Pilze 3 teil, p. 284 (1913).

Convolvulus tricolor L. dry stems harvested in Iasi on 1.XI.2010 presented black spots where microfungus opens peritheciums to observe were. They have up to 1 mm in diameter, with pore slightly raised. Through this pore entire mass of ascs containing 8 ascospores are eliminated. Ascs

[1] University of Agricultural Sciences and Veterinary Medicine of Iaşi

sizes were registered between 29-30 x 8-12 µm. Ascospores are hyaline and measure 10 x 2-3 µm.

Micromycetes was cited only in 1970 by Eugenia Eliade on material from the Bucharest Botanical Garden. *Convolvulus tricolor* L. is new host plant for this micromycete in Moldova.

4. *Plasmopara obducens* Schröter, Kr. Fl. Schles, I, p. 238 (1886); Berlese et De Toni, in Sacc., Syll. Fung. VII, p. 242 (1888); A. Fischer, Phycomycetes, in Rab. Kr. Fl. Deutsch IV, p. 434 (1892); W. Migula, Kr. Fl. Deutsch., Pilze I, p. 161 (1910); Tr. Săvulescu şi Tharna Rayss, Ann. Mycol. XXXII, nr.1-2, p. 39 (1934); Tr. Săvulescu şi Olga Săvulescu, Studiul morfologic, biologic şi sistematic al genurilor *Sclerospora*, *Basidiophora*, *Plasmopara* şi *Peronoplasmopara*, p. 360 (1951).

Impatiens balsamina L. plant leaves, harvested in Iasi on 27.IX.2010 presents bleached-looking areas with oily spots. On the bottom parts of leaves appear 4 -10 sporangiophores, 350-500 x 6-12 µm long. The upper part of sporangiophores present 2 - 3 branches, straight, horizontal, 4-5 times dichotomy branched. Sporanges are oval or almost spherical with 13 x 15 µm in diameter.

Micromycetes was cited only on *Impatiens noli-tangere* L. so that *Impatiens balsamina* L. is new host for microfungus in Romania.

5. *Botryosphaeria berengeriana* Ces. et de Not., Sfer. Ital., 82 tab. 90 (1863); Sacc. Syll. Fung., I, p. 457 (1882) et Michelia I, p. 491 (1879); Migula Kr. Fl., Band III Pilze, 3 teil, 2 Ab., p. 650 (1913); Sandu-Ville C., Ciup. *Pyrenomycetes-Sphaeriales* din România, p.103 (1972).

Philadelphus coronarius L. dry branches collected in Iasi on 20 XI 2010 shows on their surface perithecium almost spherical, with a small osteol papilla, used from ascs (70-80 x 18 µm) to leave the ascocarp. Ascs present 8 ascospores oval, unicellular, hyaline, seated on two rows (size 20 x 20 µm).

In Romania the fungus was identified on *Rhamnus frangula* L., *Populus nigra* L., *Salix capraea* L. and *Prunus mahaleb* L. *Philadelphus coronarius* L. is new host plant in Romania for this micromyceta.

6. *Chaetomium globosum* Kunze ex Fr., Kze. et Schm. Myk. Hefte. I, p. 15-16 (1817); Wallr., Fl. Cr. p. 265 (1833); Sacc. Syll. Fung. I, p. 222 (1882); Migula, Kr. Fl. Bd. III, Pilze 3 Teil, 1. Ab. p. 114, taf. XXX - 1, 2 (1913); Gilman J., A Manual of Soil Fungi, p. 179 (1957); Dennis R.W.G, British *Acomycetes*, p. 265 (1968); R. Hanlin, Ilustrated genera of *Ascomycetes*, p. 100 (1990).

Moldered leaves of *Juglans regia* L. harvested in Iasi on 20 XI 2010 shows black spots represented by black, spherical perithecium with dimensions of 250-300 x 250 µm. Perithecium wall is black, hard and with many flexuous brownish septum, 3-4 µm wide and up to 500 µm long. Obclavate ascs have dark ascospores with ovoid shape, from 8.5 to 9 x 6 µm lengths.

Micromycetes is reported from the soil and on various substrates, but the host plant *Juglans regia* L. is new for the microfungus in Romania.

7. *Otthia spireae* Fuck., Symb. Myc., p. 170 (1869); Sacc. Syll. Fung., I, p. 735 (1882); Migula W., Kr. Fl. Bd. III Pilze, 3 teil 1 Ab., p. 202 (1913).

Spiraea x *Billardii Henricq* (*S. douglasii* x *S. salicifolia*) shoots were harvested in Iasi on 10.X.2010. They presented on their surface spherical perithecium, with brown walls and cylindrical neck. The neck (rostrum) has 250-300 µm lenth and 60 µm on diameter. It is used for cylindrical and pedunculated ascs (180 x 18 µm) elimination Ascospores are cylindrical, opaque, brown, 28 x 12 µm length. In perithecium are numerous hyaline paraphysis.

Spiraea x *Billardii Henricq* is a new host plant in Romania to this fungus.

8. *Coleosporium senecionis* (Pers.) Fries., Summa Veg. Scand., p. 512 (1849); Winter G., Rebenh. Kr. Fl. Deutsch. I, 1 teil, p. 248 (1884); Sacc., Syll. Fung. VII, p. 751 (1888); Săvulescu Tr., Monografia Uredinalelor din R.P.R., p. 417 (1953).

Leaves of *Pinus nigra* Arn., harvested in Iasi on 10. XI.2010, were covered by brown spots with a whitish membrane, that breaks easily. By membrane breaking are released aecidiospore (30 x 20 µm).

Micromycetes is cited in Romania only on *Pinus silvestris* L., so that *Pinus nigra* Arn. is a new host plant.

9. *Melampsora Evonymi-capraearum* Kleb., Zeits., f. Planz., XVIII, p. 139-147 (1899); Săvulescu Tr., Monografia Uredinalelor din R.P.R., p. 442 (1953).

Young branches of *Evonymus radicans* Sieb. ex Miq. showed areas where cluster cup (aecidium) types Caeoma have 1.5-2 mm high. 18-22 x 12-18 µm aecidiospore have polyhedral form.

Micromycetes is cited to us only on *E. europaeus*, so that *Evonymus radicans* Sieb. ex Miq. is a new host plant for this fungus.

10. *Torula herbarum* (Pers.) Link. Ex Gray, Nat. Arr. Br. Pl. 1, p. 557 (1821); Ellis M. B., Dematiaceous Hyphomycetes, p. 337, fig. 231 A (1971).

Symphoricarpos orbiculatus Moench. dry branches, harvested in Iasi on 10.IX.2010, presents on their surface black mycelia colonies with 7 µm cells in diameter. Conidiophores are short and 2-6

µm wide. Conidia are brown, 20 x 5 µm, and have three cross walls and are strangled in the right of septum.

Symphoricarpos orbiculatus Moench. is new host plant to this micromycete in Romania.

11. *Alternaria dianthicola* Neergard, Danish. Sp. Alt. Stemphyllium p. 190 (1945); P. Joly, Le genre *Alternaria*, p. 133 (1964); M. B. Ellis, *Dematiaceous Hyphomycetes*, p. 479 (1971).

Dianthus glabriusculus (Kit) Bob. dry leaves and flowers harvested from Iasi on 25.XI.2010 presented black spots. Black areas are covered with short, brown, 150 x 4 µm conidiophores. Conidia are smooth and have a wide apex ranging in size from 43-75 x 13.5 µm. Micromycetes was first reported in 1972 in Cluj Napoca by Szasy Elizabeth and has since been cited on 30 other species from *Dianthus* genera. However on *Dianthus glabriusculus* (Kit) Bob is new in Moldova.

12. *Alternaria brassicicola* (Schw.) Wiltshire, Mycol, Pap. XX, p. 8 (1817) Ellis M. B., *Dematiaceous Hyphomycetes*,p. 467 (1971).

Microfungus isolated from *Iberis umbellata* L. was harvested in Iasi on 10.X.2010. It form on stems plant elliptical, black, colonies with brown septet mycelia. Conidia are occurring singly or in short chain. Presents many cross wall and dimension of 60 x 7 µm.

Iberis umbellata L. is new host plant to this microfungus in Romania.

13. *Alternaria tenuis* Nees., yst. D. Pilze., Schwam., p. 72 (1817); P. Joly, Le Genre *Alternaria*, p. 167 (1964).

Pinus nigra Arn cones covered by mycelium from this cosmopolite fungus were used for determination. Micromycetes have conidiophores less branched, supporting spores with 20 x 10 µm length and an apex of 4.5 µm.

Pinus nigra Arn. is new host plant to this micromycete in Romania. The same fungus was isolated from *Evonymus radicans* Sieb. et Mig. which is also new host plant to this micromycete in Romania.

14. *Alternaria tenuissima* (Fr.) Wilt., Trans. Brit. Mycol. Soc., XVIII, p. 157 (1933); Joly P., Le Genre *Alternaria*, p. 129 (1964).

Dry stems of *Impatiens balsamina* L., harvested in Iasi on 27.IX.2010, presented dark mycelia. Conidiophores simple, transparent and conidia with 20-25 x 9-12 µm length were isolated.

Microfungus is cited in Romania by Veronica Tudosescu on *Impatiens glandulifera* Royle, but Impatiens balsamina L. is new host plant to this micromycete.

Hemerocallis fulvia L. with conidia of *Alternaria tenuissima* appearing mixed with *Vermicularia liliacearum* West. is new host plant to this microfungus in Romania.

15. *Vermicularia Liliacearum* West., Prod. Fl. Bat., II, 4, p. 113 (1857); Sacc. Fungi Ven., p. 198 (1875); Sacc., Szll. Fung. III, p. 233 (1884); Migula, Kr. Fl. Bd. III, Pilze 4 teil, 1. ab., p. 148 (1921).

Dry leaves of *Hemerocallis fulva* L., harvested in Iasi on 27.IX.2010, presented small black spots, represented by spherical pycnidium with spiky brown cross walls. Pycnospores are colorless, slightly curved, with pointed ends and measure 19-20 x 5 µm.

In Romania this fungus was found in 1962 on *Hemerocalis lilio-asphodelus* L. and in 1997 on *H. middendorfii* Tr. et. Mry. *Hemerocallis fulva* L. is so new host plant to this microfungus in Romania.

Following the rarely related microfungi in region of Moldova in recent years are listed.

1. *Erysiphe polyphaga* Hamm. on leaves of *Petunia atkinsiana* DC ex Merat.(Iaşi -10.X.2010) *Oidium* conidiospores form and cleistotheciums of 100 µm diameter, with 1-2 fulcrums and 4-6 ascs with 3 ascospores. It was cited only one time in 1965, in Banat.

2. *Septoria dianthicola* Sacc. on leaves *Dianthus glabriusculus* (Kit.) Bob. (Tg. Neamţ - 19.VII.1977). Build globular pycnidiums, 80 µm diameter, with one-celled pycnidiospores, slightly bent, hyalines, of 15 x 3 µm. It was cited only one time in 1971 by M. Mititiuc and D. Dăscălescu.

3. *Alternaria dauci* (Khün) Gr. et Sk. f. sp. *porri* (Ellis) Neerg. on leaves of *Allium sativum* L. (Iaşi-15.VIII.2010) form conidia of 75x 17,5 µm. It was cited only one time in 1976, in Cluj.

4. *Alternaria tenuissima* (Fries) Wilts.:

- on stem of *Yucca filamentosa* L. (Iaşi-10.VII.2010) occur conidiophores with conidia of 37-43 x 12-18 µm. It was cited only one time in 1962, in Iaşi
- on dried leaves of *Hosta plantaginea* (am.) Aschers. It was isolated only one time in 1962 in Iaşi by C.Sandu-Ville;
- on leaf of *Hosta japonica* (Thunb) Aschers. It was cited only one time in 1962, in Bucharest by Olga Săvulescu.

5. *Cladosporium fasciculatum* Cda.:

- on leaves of *Hemerocallis fulva* L.(Iaşi-20.IX.2010). It was cited only one time in Iaşi (1962).

CONCLUSIONS

In the period between 2009 and 2010 in the central area of Moldova were found two new micromycetes, 13 new fungal host plants already

identified in the country, two host plants and five new fungal for region of Moldova on seven host plants that rarely found in the country.

The analysed materials were included in Mycological Herbar of Moldavia "*C. Sandu-Ville*".

BIBLIOGRAPHY

1. **Allescher, A., 1903** - *Rabenhorst Kryptogamen Flora von Deutsch., Öesterr. und Schweiz*, Die Pilze, VII, abt. Fungi imperfecti – Leipzig.
2. **Booth, C., 1971** - *The Genus Fusarium,* C.A.B. England.
3. **Bontea, Vera, 1986** - *Ciuperci parazite şi saprofite din România.* Ed. Acad. R. S. R.
4. **Ellis, M.B., 1971** - *Dematiaceous Hyphomycetes, Surrey,* England.
5. **Gams, W., 1970, 1971** - *Pilze aus Agrarböden, Cephalosporium Artige Schimmelpilze (Hyphomycetes).*
6. **Gilman, J.C., 1957** - A *Manual of Soil Fungi,* Iowa, U.S.A.
7. **Grove, M.A., 1935** - *British Stem and Leaf Fungi, vol.I, Sphaeropsidales,* Cambridge.
8. **Grove, M.A., 1967** - *British Stem and Leaf Fungi, vol.II, Coelomycetes,* Cambridge.
9. **Migula, W., 1913** - *Kryptogamen Flora von Deutschland,Deutsch-Osterreich und der Schweiz,* Bd.III Pize 3 teil 1 ab.,Verlag Friederich, Berlin.
10. **Migula, W., 1921** - *Kryptogamen Flora von Deutschland, Deutsch-Osterreich und der Schweiz.* Bd.III Pilze 4 Teil 1 ab., Berlin.
11. **Raper, K.B., 1968** - *A Manual of the Penicillia,* H.P.C., Londra.