

SAPROPHYTIC AND PARASITIC FUNGI ON ORNAMENTAL PLANTS FROM MOLDOVA AREA (ROMANIA)

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Abstract

This study presents a mycology note that reflects further research for several years of teaching staff of the Faculty of Agriculture, University of Agricultural Sciences and Veterinary Medicine "Ion Ionescu de la Brad" University conducted on ornamental plants in parks and gardens. Research conducted on ornamental plants led to a ten fungal reports, two of them are new for the country, one fungus is new for Moldova microflora, four are new cited like hosts in Romania, one fungus is cited on a new hosts in Moldova and two are very rare cited in Moldova.

Key words: ornamental plants, fungus, host plant

Fungi are one of the most important groups of organisms on the planet. Fungi may limit the kinds of ornamental plants that can grow in a large geographic area.

These 'pathogenic' or disease-causing fungi get inside the plant either by making a hole in its skin (epidermis), or by growing in through the plant's breathing holes (stomata). Then they kill the plant cells before absorbing food from them, or simply steal nutrients from the living cells. The spores of some fungi come through the air and attack leaves, making dead spots or even killing the whole leaf. Some fungi live in the soil and enter roots.

They can either block the water-conducting cells or kill them, causing the plant to wilt. In many cases the plants is seriously damaged or may even die. So such pathogenic fungi can threaten the ornamental plans.

MATERIAL AND METHOD

Ornamental plants were followed under phytopathological aspect throughout the year and degraded specimens of different pathogens were collected, brought to the laboratory and were subjected to macroscopic and microscopic investigations. For each plant attacked were made determinations, microscopic sections and micrometer measurements to asexual or sexual organs, in order to establish systematic classification of parasitic or saprophytic fungal species.

RESULTS AND DISCUSSIONS

During the vegetation and the rest of ornamental plants were isolated and determined the following micromycetes:

1. *Colletotricum orchidearum* Allesch., Rab. Kr. Fl., VII, p.563(1903); Sacc. Syll. XVIII, p.467(1906); Died., Krypt. der Mark Brand., p.819(1915); Migula, Kr. Fl. Bd.III, Pilze, 4 teil, 1 Ab, p.558(1921); Grove, British Stem and Leaf Fungi, vol.II, p.233 (1967). On *Phalaenopsis* x leaves were observed large spots, elliptical, 10 x 4-5 cm on their surface the upper epidermis arises yellowing and drying area. Affected area has numerous small black spots represented by acervuli up to 500 micrometre located on a brown parenchymatous tissue. These acervuli are lined with brown spikes of 80-130 x 4 μm (fig.1, a). The conidia from hyaline conidiophores are, elongated, cylindrical, botuliforme, hyaline, of 17.5 to 20 x 4 μm (fig.1,b).

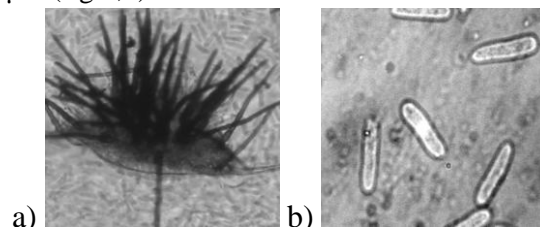


Figure 1 **Acervuli of *Colletotricum orchidearum* (a), Conidia of *Colletotricum orchidearum* (b)**

The fungus is new for Romanian microflora where now are imported a lot of species and hybrids of

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orchis. In this case it is a hybrid that has purple flowers.

2. *Pestalozzia cupressina* Niessl, Hedwigia, 1883, p.188 (1864); Sacc. Syll. Fung. III, p.792 (1884). This fungus determined on *Cupressocyparis leilandi* Dall. plants, appears on the dry leaves areas as acervuli with conidiophores initial developed on lower epidermis of leaf. It support brown conidia with 3 transverse walls, with 2 terminal hyaline cells endowed with cilia hyaline. The 3 cell brown, almost square in shape, were about $20 \times 7.5 \mu\text{m}$. *Pestalozzia cupressina* fungal founded in Iași on 12.02.2011 is a harmful parasite and is new for Roumanian microflora.

3. *Lophodermium macrosporum* (Hart.) Rehm, Rabenh. Kr. Fl.Deutsch. 1(3) p.45 (1887); Dennis, British Ascomycetes, p.201 (1968); Mititiuc M., Viorica Iacob, Fungus on trees and shrubs in our forests, p.182 (1997). On *Pinus* sp. needle founded in Iasi on 15.07.2011, were brown spots, with stromatic black streaks parallel to the main ridge. Inside stroma that swell cuticle, are forming apothecia with ascus about $100 \times 15 \mu\text{m}$, gelatinous walls with 8 ascospores hyaline about $75 \times 1,5 \mu\text{m}$ (fig.2).

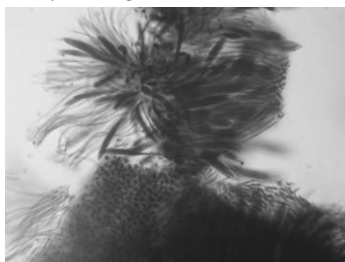


Figure 2 Ascospores of *Lophodermium macrosporum*

Fungus is cited on pine, in Romania by several authors: Banhegyi (1942), Blada (1961), C. Georgescu (1955,1960); Lungescu Elena (1966); Precup et all. (1965), Richițeanu (1971, 1976, 1980), Bontea 1977, under synonymy of *Hypoderma macrosporum* Hart. Is cited by Tr. Săvulescu et all. In 1951. This micromyceta is new for Moldova.

4. *Gliocladium atrum* Gilman and Abbott, A summary of the soil fungi Iowa, p.225 (1927); Gilman J.C, A Manual of Soil Fungi, p.291 (1957). This micromyceta were isolated from *Saintpaulia ionantha* Wendl. plants that presented withered leaves touching the ground soil, become brown and after rot. Affected area by the fungus is covered with a gray micelyum, formed by smooth and flexuous conidiophores about $300 \times 3 \mu\text{m}$ (fig.3). Conidia appear grouped on conidiophores branches. Primary branches are oblong measuring $9 \times 3 \mu\text{m}$. Metula are also oblong with $8 \times 3 \mu\text{m}$ and phialides are about $8 \times 2 \mu\text{m}$. Conidia has smooth walls from $2,5 \times 2 \mu\text{m}$. Fungus were isolated

on 12.04 2011 in Iasi and it was mentioned only on greenhouse soil then *Saintpaulia ionantha* Wendl. Is a new host in Romania.

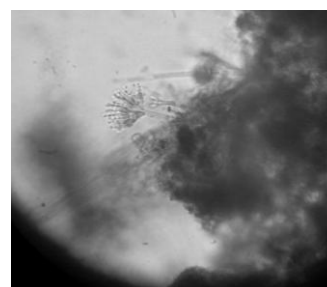


Figure 3 Conidiophores of *Gliocladium atrum*

5. *Microsphaera polonica* Siemaszko, Rev. Path. Vég. et Enrom. Agr.XX (1933); Olga Săvulescu, Hydragea Oidium. Com. Acad. R.P.R. IV, p.9-10 (1954); C. Sandu-Ville, Erysiphaceae fungus in Romania, Bucuresti (1967). Fungus were identified on Romania in 1954 by Olga Săvulescu and E. Docea at Bucuresti and by C.-Sandu-Ville at Iași, on greenhouse C.F.R. Now we mention it on *Hydrangea macrophylla* DC, at Iasi on 20.IX 2011 that is a new host in Romania.

6. *Volutella ciliata* (Alb. Et Schwein) Fr. ,S.M., III, p.467(1832); Mont., A.S.N 2, sér.VI,p.30(1835); Lindau, Rab. Kr. Fl., IX, p.483(1910); Diedicke, Kr.der Mark. Brand., p.710(1915); Migula, Kr. Fl. Bd. III, Pilze, 4 Teil, 2 Ab., p.493,Tab.CLXII, fig.17-19(1934); Gilman, A Manual of Soil Fungi, p. 356(1957). Fungus develop on *Phalaenopsis x* plants a white-pink mycelium with obvious pustules, hemispherical, about $200 \mu\text{m}$ in diameter. They had on margins numerous seta about $250 \times 8 \mu\text{m}$. Conidiophores are simple, hyaline (colored in pink) and are supporting elliptical conidia, hyaline from $5-7 \times 2 \mu\text{m}$ (fig. 4). In Romania this micromyceta is mentioned on different substrates by: Grințescu (1916), Alteraș (1970), Căpușan et all (1959), Comes (1965), Georgescu (1955), Moruzi (1970), Eugenia Eliade and Cristurian (1971) however we mention it on *Phalaenopsis x* that is a new host in Romania.

7. *Glomerella cingulata* (Stone)Sp. et Schr., The bitter rot fungus, Sci. XXVII, p.750-751(19030), The bitter rot of apples, US Dep. Of Agr.,Bur. Plant Industry, p.44-54, tab.I-IX(1903); Sandu-Ville, Ciuperci Pyrenomycetes-Sphaeriales, p.188(1954).Syn.-*Guignardia microsticta* Sacc., Syll XXII, p.75(1913); Arx end Muller, Beitr. Zur Krypt. Fl., der Schweiz, p.,188(1954). Perithecium appear in rare groups, on dry area of *Phalaenopsis x* leaves. Are about $150-170 \mu\text{m}$ in diameter with a thick perithecium of $15 \mu\text{m}$. Asca is from $50 \times 7 \mu\text{m}$, elongated, easily cudgel, with ascospores placed on two rows with $10 \times 4 \mu\text{m}$ and a granulated content. Fungus were determined on

Phalaenopsis x leaves that represent a new host for Romania.

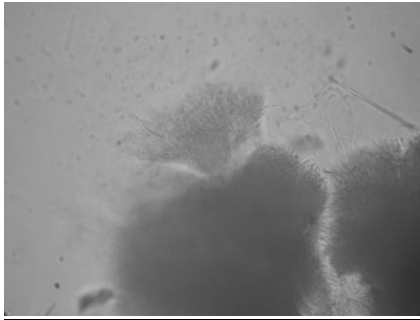


Figure 4 Conidiophores and conidia of *Volutella ciliata*

8. *Cladosporium herbarum* (Pers.)Link., Tent. Disp. P.75 (1797) ex S.F.Gray (1821); Lindau, Rabenh. Kr. Fl.Deutsch., Öesterr.,und Schweiz, VIII,p.800 (1907); Migula,Kr. Fl.Bd. Pilze 4 Teil, 2 Ab., p.300 (1934); M.B.Ellis, Dematiaceous Hyphomycetes, p.313 (1971). On *Dianthus barbatus* L. leaves and stems that whintering appear a black mycelium form by conidiophores and conidia of fungus. Conidiophores appear in bunches, borwn, septated, long about 1/3 mm, thick of 3-6 μm that are sustaining by elongated conidia, bicelled, cylindrical, lightly sharp at one of ends, smooth membrane from 15-20 x 5-7 μm . Mycromiceta is cosmopolitan but *Dianthus barbatus* L. is a new host for Moldova microflora.

9. *Diplodia deflectens* Karst., Frag. Myc. VIII(1882) Hedwigia XXIII, p.18(1896); Karst, Symb. XIII, p.12(1874); Sacc. Syll. III, p.345(1884); Migula, Kr. Fl. von Deuts. Deuts., Öesterr. und Schw. Bd. III, Pilze 4, Teil 1Ab. p.327(1921).

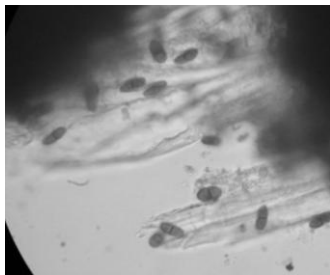


Figure 5 Bicelled spores of *Diplodia deflectens*

On *Lonicera tatarica* L. branches in the spring of march 2012- were observed numerous picnidia with black wall , coal -like about 1000-1500 μm in diameter. Brown spores that go aut from pycnidia have from 15-20 x 7-8 μm , are bicelled, with round ends without oiled drops (fig. 5). Fungus is mentioned in Romania by Tr. Săvulescu and C. Sandu-Ville in 1935 and by C. Sandu-Ville and I. Rădulescu in Moldova on 1954. Mycromiceta is rare mentioned in Moldova.

10. *Camarosporium Xylostei* Sacc.,Syll. III, p.461 (1884); Allesch., Die Pilze, Fungi

imperfecti, p.271 (1903); Diedicke,Kr., der Mark Branden., p.676 (1915); Migula, Kr. Fl. von Deuts. Deuts., Öesterr. Und Schw. Bd. III, Pilze 4, Teil 1Ab. p.367 (1921); Grove, British Stem and Leaf – Fungi, Coelomycetes vol. II p.98(1967). On *Lonicera tatarica* L. parched bark appear numerous black spots that are suddenly opened by breaking represented by *Camarosporium* type pycnidia, black, spherical with a papilla that are going out pycnosporos. These are brouwn, elongated, with rounded ends, with 3-4 transversal walls about 18-20 x 8 μm (fig.6). Fungus was mentioned in Romania only once by C. Sandu-Ville and his mycology collective from Iasi in 1962. Mycromiceta is rare mentioned in Moldova.



Figure 6 Pycnosporos of *Camarosporium Xylostei*

CONCLUSIONS

Determinated fungus were noted and included in Herbarium Mycologicum Moldavicum to expand the mycological collection. After researchs conducted on ornamental plants have been pointed out ten fungal: two are new for the country, one fungus is new for Moldova microflora, four are new cited like hosts in Romania, one fungus is cited on a new hosts in Moldova and two are very rare cited in Moldova.

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