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ULTRASTRUCTURAL ASPECT OF STRUCTURE SOMATIC AND REPRODUCTIV OF THE SPECIES OF *PHOMOPSIS* (SACC.) BUBÁK

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Abstract
Phomopsis (Sacc.) Bubák is a large coelomycetous genus that includes over 1000 species names. Genus Phomopsis has a special theoretical and practical importance successfully pointed out in several problems concerning the taxonomy, the nomenclature and the pathogenesis of the species of this type. So far, in Romania have been described 123 taxons on species of host – plants which are spontaneous or cultivated and which have got a great importance in economy and flora.
Keywords: conidia, conidiophores, *Phomopsis*, structure somatic.

1. INTRODUCTION

Phomopsis (Sacc.) Bubák represents a very large genus from the group imperfecti fungi (Ainsworth, 1995), having over 180 species accepted in micobiota of the globe (Uecker, 1988). In Romania have been described 123 taxons on species of host – plants which are spontaneous or cultivated and which have got a great importance in economy and flora (Bontea, 1985; Cristescu, 2003)

The tipical species of genus *Phomopsis* depict an immersed, brached, septate, hyaline to pale-brown mycelium. Their conidiomata are pycnidial, stromatice, which are immersed in substratum. They, can also, be separated or aggregated and conffluent, globose, ampulliform or applanate, unilocular or multilocular. As a rule, they emerge through a circular often papillate ostiol. The wall of the conidiomata is pseudoparenchyma, brown and colour with *textura angularis* (Alexopoulos, 1996).

Conidiophores are hyaline, branched and occasionally they are short and 1-2 – septate. Frequently they are multiseptated and filiforms.

The conidiogenesis is enteroblastic monophialidic (Sutton, 1980).

The conidia are of two types for the majority of species: alpha and beta- conidia. So far, only for five species of *Phomopsis* there has been discovered the third type of conidia which is gamma.

Alpha- conidia are hyaline, ellipsoide or fusiform, straight, aseptate, ordinary biguttulate, but sometimes, they are also more guttulate.

Beta- conidia are hyaline, filiform, aseptate, straight or curved, aguttulate. Beta- conidia are unknown in most species and their production is erratic in many.

Despite its distribution and its economical importance, the genus hasn't had the adventage of monographed treatments so far. Because of the absence of the teleomorph (only at twenty percent of

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the species there has been connection with the teleomorph of *Diaporthe*) the problems which reffer to the taxonomy and the nomenclature of this genus stay unclear.

2. MATERIALS AND METHODS

The micologic material has been collected from the Romania.

The isolation of fungi in case of contamination has been done by direct observation at the stereomicroscope or by the method of wet camera. The microscopic produces have been made in blue – coton in lactophenol.

In our cytology researches were used-up young isolate obtained the *in vitro* on PDA (potato-dextrosa-agar). Isolate was *Phomopsis lirelliformis* from *Weigelia florida* studies of transmission electron microscopy permited of an ultrastructural characters differences between of the two type of fialospori.

3. RESULTS AND DISCUSSIONS

Phomopsis aesculana (Sacc.) Petrak, 1921 (≡ *Fusicoccum aesculanum* Sacc.), conidiomata are pycnidial, stromatic, 300-500 µm wide, immersed, subperidermice, confluent, unilocular/multilocular; conidiophores are multiseptated, 10,5-17,5 (-28) x 1,5-2 µm wide; alpha-conidia hyaline, 6-8 µm long x 2-2,5 µm wide, aseptate, 2-3-guttulate. Identified on *Aesculus hippocastanum*, Argeş, Piteşti, Trivale, 10.07.1999, $44^0$51´N $24^0$52´E; Bucharest, 13.06.2003, $44^0$26´N $26^0$00´E.

Phomopsis aucupariae (Bres.) Petrak, 1925,conidiomata are pycnidial, stromatic, 150-600 µm wide, immersed, subepidermice, separate or confluente, multilocular; conidiophores are multiseptated, 22-25 x 1,5-2 µm wide; alpha- conidia hyaline, 6-10 µm long x 1,5-2 µm wide, aseptate, 2-guttulate. Identified on *Sorbus aria*, Argeş, Piteşti, Expoparc, 22.08.1999, $44^0$51´N $24^0$52´E.

Phomopsis brachyceras Grove, 1935. Conidiomata are pycnidial, stromatic, 200-500 µm wide, immersed, subperidermice, separate or confluente, unilocular; conidiophores are multiseptated, 10-15 x 1,5 µm wide; alpha- conidia hyaline, 6-7 µm long x 1,5-2 µm wide, aseptate, 2-guttulate. β-*conidia* hyaline, aseptate, eguttulate, 26-30 x 1 µm. Identified on *Ligustrum ovalifolium*, Argeş, Mărăcineni, 19. 10. 2002, $44^0$53´N $24^0$53´E.

Phomopsis carpogena (Sacc. et Roum.) Died., 1911. (≡ *Phoma carpogena* Sacc. et Roum.) Conidiomata are pycnidial, stromatic, 200-600 µm wide, immersed, subepidermice, confluente, unilocular; conidiophores are short, 10-14 x 1,5 µm wide; alpha- conidia hyaline, 7-8 µm long x 1,5-2 µm wide, aseptate, 2-guttulate. Identified on *Catalpa bignonioides*, Argeş, Piteşti, 12.03.2000, $44^0$51´N $24^0$52´E.

Phomopsis consocia (Sacc., Bommer & Roussel) Died., 1911. (≡ *Phoma consocia* Sacc., Bommer & Roussel)Conidiomata are pycnidial, stromatic, 350-600 µm wide, immersed, subepidermice, separate, unilocular; conidiophores are multiseptated, 10,5-17,5 x 1,5-2 µm wide; alpha- conidia hyaline, 6-10,5 µm long x 1,5-2 µm wide, aseptate, multiguttulate. Identified on *Hippöphae rhamnoides*, Argeş, Mărăcineni, 18.10.2000, $44^0$53´N $24^0$53´E.

The general plan of organization ultrastructural of conidia is generally unitary. But our researches were observed marked differences between mature alpha and beta-conidia with regard to cellular components (figure 1-3), such as:

- a round nucleus occupied a central position in the cytoplasm of alpha-conidia; an elongate nucleus is present in cytoplasm of beta-condia;

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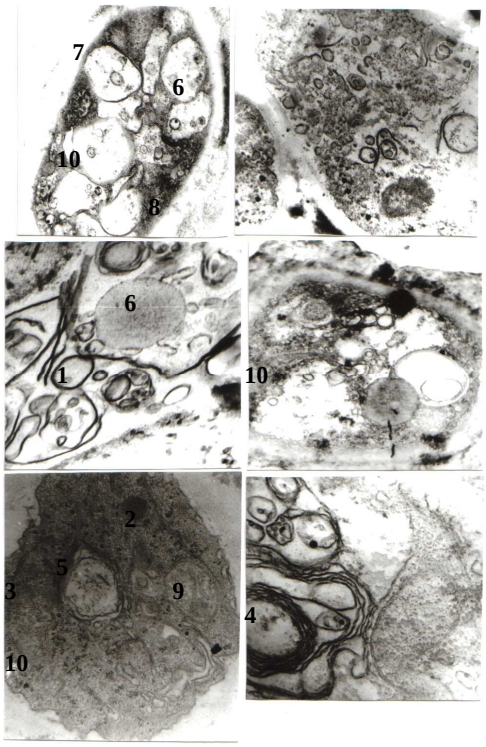

Figure 1. Ultrastructure of alpha-conidia *Phomopsis lirelliformis*: 1 – lipid droplets; 2 – lysosome; 3 – mitochondria; 4 – nucleus; 5 – nucleolus; 6 – protein; 7 – cell wall; 8 – plasma membrane; 9 – endoplasmic reticulum; 10 – vacuoles

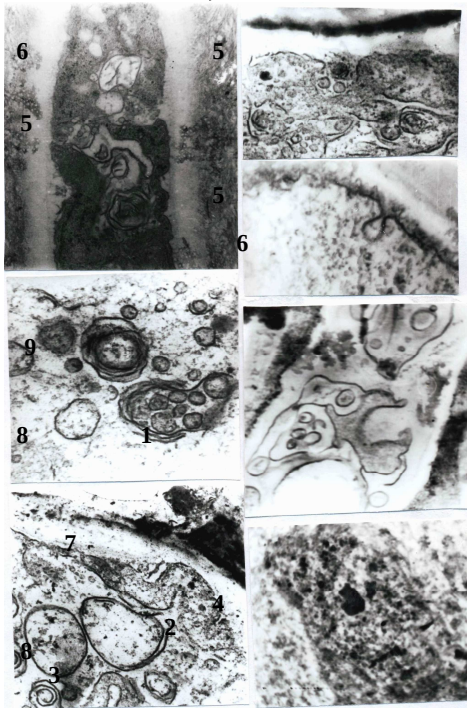

Figure 2. Ultrastructure of β- conidia *Phomopsis lirelliformis:* 1 – membrane accumulations; 2 – chromatin; 3 – lysosome; 4 – nucleus; 5 – cell wall; 6 – plasma membrane; 7– endoplasmic reticulum; 8 – vacuoles; 9 – autophagic vacuoles

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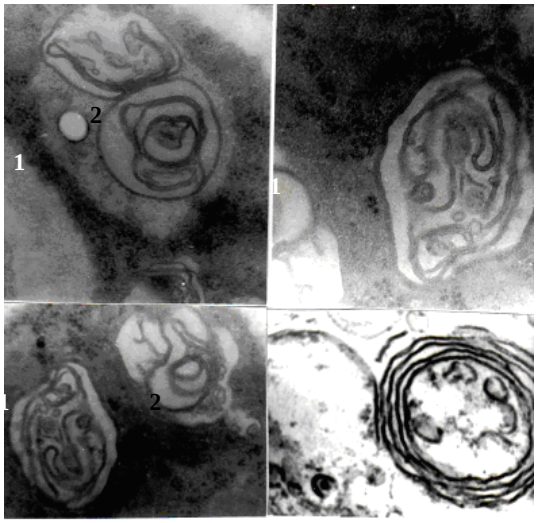

Figure 3. Ultrastructure of β- conidia *Phomopsis lirelliformis:* 1 – membrane accumulations; 2 – autophagic vacuoles

- in the cytoplasm of beta-conidia, a few mitochondria could be seen and a small number of cristae recognized; mithocondria of alpha-conidia have long cristae.
- membrane accumulations were regularly present in the beta-conidia,
- the storage material of alpha-conidia was large lipid droplets, usually situated at the poles, in contrast with beta-conidia.
- in beta-conidia membrane accumulations were closely connected to the plasma membrane; these occupied a large portion of the cell lumen.
- the cell wall of alpha-conidia appeared to be double-layered.
- differences in dimension and number of lipid droplets suggest that lipid reserves are mobilized and utilized during fungal spore germination.
- the accumulation of membranes and the disintegration of the cytoplasm (autophagic vacuoles) suggest that incapacity of beta-conidia to germinate might be due to premature senescence.

4. CONCLUSIONS

In Romania have been described 123 taxons on species of host – plants which are spontaneous or cultivated and which have got a great importance in economy and flora

The general plan of organization ultrastructural of conidia is generally unitary.

But our researches were observed marked differences between mature alpha and beta-conidia, such as: wall, cell, plasma membrane, density of the cytoplasm, mithocondria, nucleus.

5. REFERENCES

Alexopoulos, C.J., Mims, C.W., Blackwell, M. (1996) *Introductory mycology*, Fourth Edition, John Wiley & Sons, Inc., New York.

Ainsworth, G.C. (1995) *Dictionary of the Fungi*, Ed.8th. Commonwealth Mycological Institute, Kew.

Bontea, V. (1986). *Ciuperci saprofite şi parazite din România.* [Saprophytic and parasitic mushrooms from Romania], Ed. Acad. R.S.R.

Cristescu, C. (2003). *A new species of Phomopsis* (Sacc.) in Romania, Rev. Roum. Biol.- Biol. Veget., 48 (1-2), 45-49.

Montanola-Cvetkovic, M., Bojovic-Cvetic, D., Vukojevic, J. (1985). *An ultrastructural study of α and β conidia in the fungal genus Phomopsis*, Cryptogamie, Mycologie, 6, 171-184.

Sutton, B.C. (1980). *The Coelomycetes*, Commonwealth Mycological Institute, Kew., England.

Uecker, F.A. (1988) *A world list of Phomopsis with notes on nomenclature, morphology and biology*, Mycologia Memoir No. 13., J. Cramer. Berlin-Stuttgart.

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