

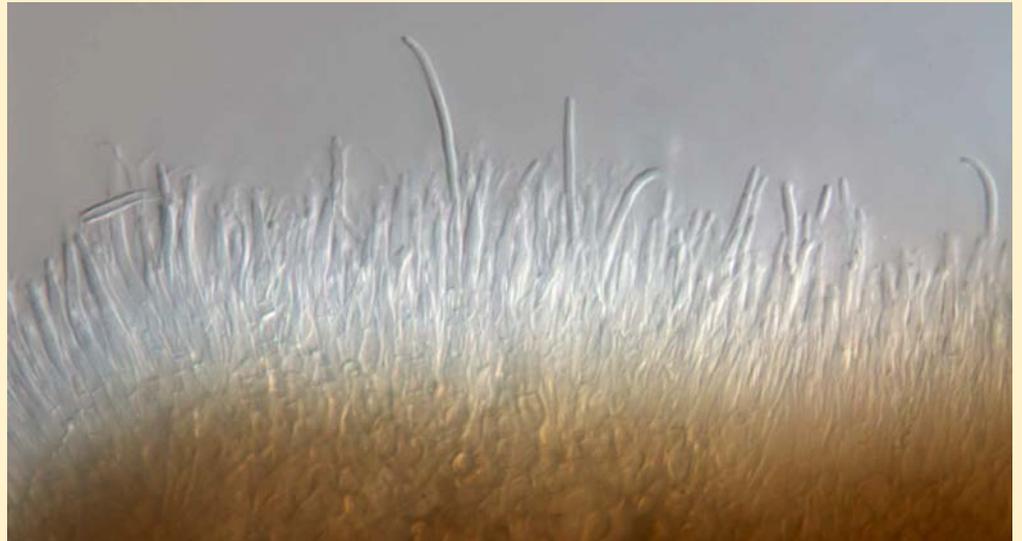
Introduction to *Diaporthe*

AANZFTA ECWP Diagnosis of Plant Diseases Workshops, 22-26 June 2015



Diaporthe

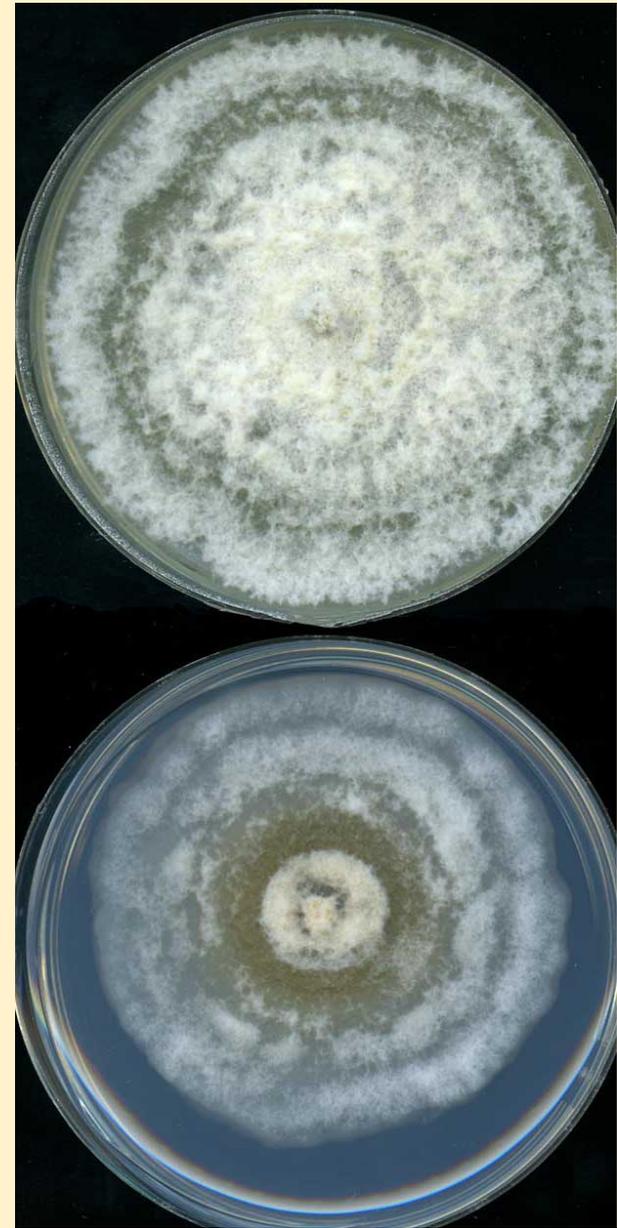
- Common and widespread plant pathogens, endophytes, saprobes and epiphytes
- Worldwide importance
- Best known as the cause of plant diseases called “blight”
- Almost 1,000 species names have been described in the literature.
- A similar number of names described in *Phomopsis*, which is a synonym of *Diaporthe*



Diaporthe species described over recent years and decades

1970-1980	6
1980-1990	11
1990-2000	10
2000	3
2001	0
2002	2
2003	0
2004	1
2005	1
2006	0
2007	2
2008	2
2009	0
2010	10
2011	18
2012	42
2013	10
2014	8
2015	0

What happened
in 2012?



phialide

alpha conidia

conidia

beta conidia

guttule

conidiogenous cell

conidiophore

Diaporthe

- Produces both alpha conidia and beta conidia



Diaporthe

- Produces pycnidia in multilocular stromata



Diaporthe

Prior to molecular studies, the taxonomy of *Phomopsis* relied on morphology.

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A World List of *Phomopsis* Names with Notes on Nomenclature, Morphology and Biology

by
F. A. UECKER



J. CRAMER

In der Gebrüder Borntraeger Verlagsbuchhandlung
BERLIN · STUTTGART 1988

- magnolicola** (H. & P. Syd.) Died. 1911. Die Gattung *Phomopsis*. Ann. Mycol. 9: 8-35(26).
Magnolia tripetata - branches (dead).
Germany - Berlin.
Conidiomata = 200-250, Conidiophores = 15-20 x 1-2, Alpha conidia = 8-12 x 2-3.
Basionym: *Phoma magnolicola* H. & P. Syd., Hedwigia 39:2. 1900.
- magnolicola** (H. & P. Syd.) Died. f. *macrosporophora* Dias & Canara. 1952. Fungi Lusitaniae 1. Agron. Lusit. 14: 101-125(110).
Magnolia grandiflora - branches.
Portugal - Lisbon.
Conidiomata = 280-400 x 180-190, Conidiophores = 30-50 x 1.25-1.5, Alpha conidia = 7.5-10 x 2-2.5.
- magocsynus** Mocsz. 1925. Mykologiai közlemények. VI. közlemény. Bot. Közlem. 2: 39-52(44).
Aconitum napellus - stems (dead).
Hungary - Budapest.
Conidiomata = 247-363, Conidiophores = 12-15(30) x 2-2.5, Alpha conidia = 7.5-11 x 3.
- mahoniae** Grove. 1930. New or noteworthy fungi. -Part XII. J. Bot. 68: 293-297(294).
Mahonia japonica - leaves (fallen).
England - Droitwich.
Conidiomata = to 300, Conidiophores = to 14-15, Alpha conidia = 6-8 x 1.5-2.5, Beta conidia = 30 x 1.
- mahonicola** (Pass. in Brunaud) Keissl. 1922. Mykologische Mitteilungen. I. nr. 1-30. Ann. Naturhist. Mus. Wien 38: 1-35(19) (as '*mahoniaecola*').
Mahonia japonica, *Mahonia aquifolium* - leaves.
France - Sautes.
Conidiophores = 6-10 x 1, Alpha conidia = 6-10 x 3-4.
Basionym: *Phyllosticta mahoniaecola* Pass. in Brunaud, Rev. Mycol. 8:140. 1886.
- majuscula** Sacc. 1906. Notae mycologicae. Ann. Mycol. 4: 273-278(275).
Tecoma radicans - branches.
USA - Lyndonville, New York.
Conidiomata = 600-700, Conidiophores = 6-8 x 2.5-3, Alpha conidia = 10-16 x 2-3.

malbranchei

Mentioned in Liud, Danish fungi as represented in the herbarium of L. Rostrup. 648pp.(241). 1913. No other mention of it found.

- mall** (Schulzer & Sacc.) Died. 1912 (Nov. 22). Pilze VII. Sphaeropsideae, Melanconiae. Kryptogamenfl. Mark Brandenburg 9: 1-96(261).
Pyrus malus - branches.
Yugoslavia - Vinkovce, Slavonia; E. Germany - Triglitz.
Conidiophores = to 16, Alpha conidia = 8-10 x 2.5-3, Beta conidia = 15-25 x 1-1.5.
Basionym: *Phoma mali* Schulzer & Sacc., Hedwigia 23:91. 1884.
Anamorph of *Diaporthe ambigua* Nitschke.

- [mal]i** Roberts. 1912 (Dec. 28). A new fungus on the apple. Phytopathology 2: 263-264(264).
Pyrus malus - branch, trunk.
USA - Virginia.
Conidiophores = 20 x 2.5, Alpha conidia = 7-10 x 3-4, Beta conidia = 20-36 x 1.5.
Anamorph of *Diaporthe perniciosa* Marchal. Later homonym of *Phomopsis mali* (Schulzer & Sacc.) Died.
Symptom or name of disease: Apple & pear canker.

- malvacearum** (Westendorp) Died. 1912. Pilze VII. Sphaeropsideae, Melanconiae. Kryptogamenfl. Mark Brandenburg 9: 241-416(245).
Lavatera triloba, *Alibea*, *Hibiscus*, *Malva* - branches (dead).
Belgium - Termonde.
Conidiomata = 375, Conidiophores = 10-20 x 1.5, Alpha conidia = 10 x 2.5.
Basionym: *Phoma malvacearum* Westendorp, Herbarium Cryptogamique Belge no.1232. 1839. = *Phoma lavaterae* Westendorp, fide Died., 1912. See also *Phomopsis lavaterae* (Westendorp) Died.

- [malvacearum]** (Westendorp) Grove. 1917. VI.-The British species of *Phomopsis*. Bull. Misc. Inform. 1917: 49-75(58).
Malva moschata - stems.
Britain; Europe.
Conidiophores = 15-18 x 1.5, Alpha conidia = 7-10 x 2-3.
Later homonym of *Phomopsis malvacearum* (Westendorp) Died.

Diaporthe

Prior to molecular studies, the taxonomy of *Diaporthe* was based on

- host (or substrate)
- size and shape of conidia
- formation of teleomorphs

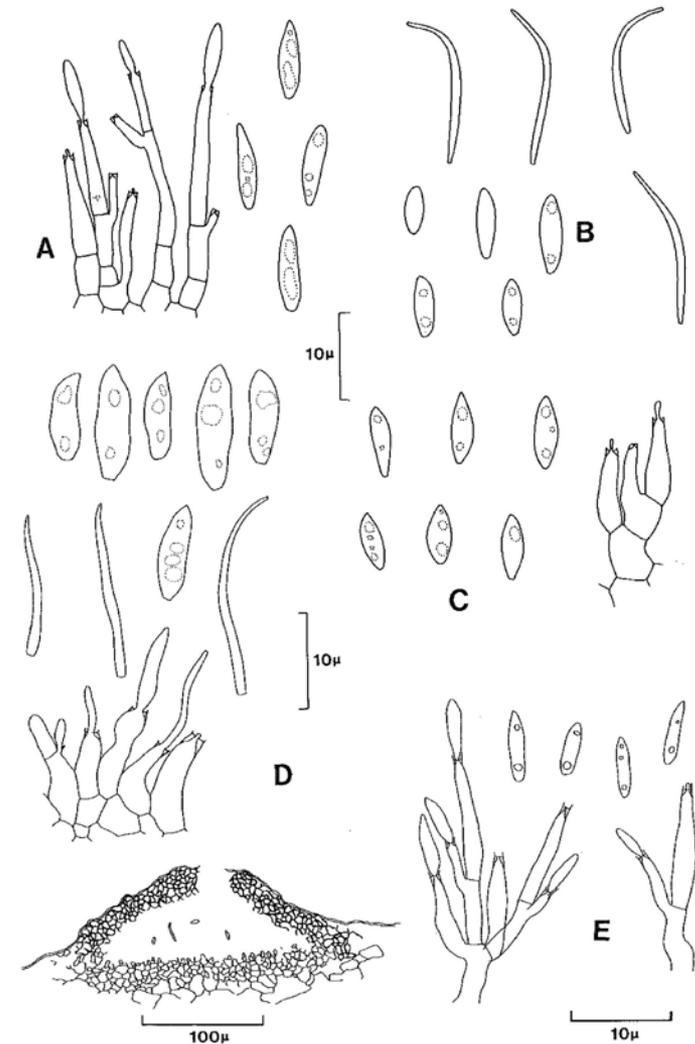
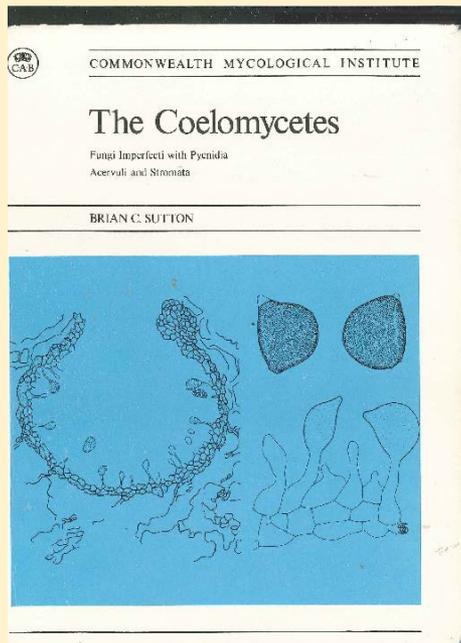


Fig. 346. A, *Phomopsis abdita*, α -conidia and conidiophores; B, *P. archeri*, α - and β -conidia; C, *P. lantanae*, α -conidia and a conidiophore; D, *P. diachenti*, α - and β -conidia, conidiophores, vertical section of a conidioma; E, *P. obscurans*, α -conidia and conidiophores.

Diaporthe

Teleomorphic stage

- Sometimes formed in cultures
- Most names in *Phomopsis* are synonyms of *Diaporthe* spp.
- Perithecia globose
- Asci 8-spored
- Ascospores septate, hyaline



Group task

What are the important plant diseases caused by *Diaporthe* spp. in your country?

How do you identify species of *Diaporthe* in your laboratory?



Diaporthe



Some interesting facts

- *Diaporthe citri* is an important pathogen of *Citrus* worldwide causing melanose and stem end rot.
- *Diaporthe toxicus* is an endophyte that produces toxins (phomopsins), which can kill sheep.
- Several species of *Diaporthe* (*D. sojae*, *D. longicolla* and *D. phaseolorum*) cause diseases (pod and stem blight, canker and dieback) in soybean.