U.S. Department of Agriculture, Agricultural Research Service

Systematic Mycology and Microbiology Laboratory - Nomenclature Fact Sheets

March 31, 2015

Phoma caricae-papayae (Tarr) Punith. 1980 (Ascomycetes, Pleosporales)

≡ Ascochyta caricae-papayae Tarr 1955 Note: Introduced as a replacement name (nom. nov.) for the homonym Ascochyta caricae Pat. 1891.

≡Phoma caricae Punith. 1979 Note: Author changed from (Pat.) Punithalingam to Punith.

[≡Ascochyta caricae Pat. 1891 - illegitimate later homonym, not included in search] Note: Not Rabenh. 1851.

[= Phoma caricina J.C.F. Hopkins 1938 - illegitimate later homonym, not included in search] Note: Not (Thüm.) Sacc. 1884.

Notes: It has been claimed that the teleomorph is a *Didymella* (*Mycosphaerella*) sp. (Ullasa 1974), but this requires further confirmation (Boerema 2004).

Distribution: Africa, Asia, Australia, New Zealand, North America (Mexico, USA (Hawaii only)), Central America, South America.

Substrate: Fruit, trunk, leaves.

Disease Note: Black leathery fruit rot, trunk rot, brown or white leaf spot.

Host: *Carica papaya* (Caricaceae).

Supporting Literature:

Boerema, G.H., De Gruyter, J., Noordeloos, M.E., and Hamers, M.E.C. 2004. ***Phoma*** identification manual: differentiation of specific and infra-specific taxa in culture. CABI Publishing, 470 pages.

Ullasa, B.A., Sohi, H.S., and Ganapathy, K.M. 1974. Ascochyta leaf spot of papaya and its perfect state. Indian J. Mycol. Pl. Pathol. 4: 218-219.

Verified By: Erica On Apr 27, 2005

Possible Teleomorph

Stagonosporopsis caricae (Sydow & P. Sydow) Aveskamp, Gruyter & Verkley 2010 (Ascomycetes, Incertae sedis)

≡ Mycosphaerella caricae Syd. & P. Syd. 1913 Note: Not (Maubl.) Hansf. 1941.

= Sphaerella caricae Maubl. 1913

≡Mycosphaerella caricae (Maubl.) Hansf. 1941 Note: Not Syd. & P. Syd. 1913.

Notes: Anamorph reported as *Phoma caricae-papayae*, but unconfirmed (Boerema 2004). Aveskamp et al. (2010) apparently accept this association, refer to the teleomorph as *Didymella*-like and not *Mycosphaerella*, and transfer the teleomorphic name *M. caricae* into the anamorphic genus *Stagonosporopsis*.

Distribution: Africa, South America, North America (FL, HI), Asia.

Substrate: Leaves, petioles, fruits, stems.

Disease Note: Fruit rot, leaf spot and stem rot.

Host: Papaya, *Carica papaya* (Caricaceae). Also *Brassica* sp.

Supporting Literature:

Aveskamp, M. , de Gruyter, H., Woudenberg, J. , Verkley, G., and Crous, P.W. 2010. Highlights of the Didymellaceae: A polyphasic approach to characterise ***Phoma*** and related pleosporalean genera. Stud. Mycol. 65: 1-64.

Boerema, G.H., De Gruyter, J., Noordeloos, M.E., and Hamers, M.E.C. 2004. ***Phoma*** identification manual: differentiation of specific and infra-specific taxa in culture. CABI Publishing, 470 pages.

Sivanesan, A. 1990. ***Mycosphaerella caricae***. C.M.I. Descr. Pathog. Fungi Bact. 984: 1-2.

Verified By: Drew On Jan 21, 2011

Nomenclature and Taxonomy

Phoma caricae-papayae:

This fungus was first described in 1891 by N.T. Patouillard, from leaf petioles of *Carica papaya* in Ecuador, under the name *Ascochyta caricae*. This was an illegitimate later homonym of *Ascochyta caricae* Rabenh. 1851, a different fungus infecting leaves of *Ficus carica*. In 1955, Tarr introduced the name *Ascochyta caricae-papayae* Tarr 1955 to replace the homonym *Ascochyta caricae* Pat. 1891. Unaware of this replacement name, Punithalingam transferred the homonym *Ascochyta caricae* Pat. 1891 to *Phoma* as *Phoma caricae* Punith. 1979 (sometimes erroneously cited as *Phoma caricae* (Pat.) Punith., but see ICBN Art. 58.1 (Greuter et al. 2000)). Punithalingam later acknowledged that the older epithet *caricae-papayae* had priority, and published the new combination *Phoma caricae-papayae* (Tarr) Punith. 1980, the currently accepted name for this fungus. *Phoma caricina* J.C.F. Hopkins 1938, illegitimate later homonym of *Phoma caricina* (Thüm.) Sacc. 1884, is considered to be a taxonomic synonym (Boerema 2004).

Evidence for a connection between the anamorph *Phoma caricae-papayae* and a *Mycosphaerella* sp. was provided by Ullasa et al. (1974). They observed *Phoma caricae-papayae* and an ascomycete matching the description of *Mycosphaerella caricae* Syd. & P. Syd. 1913 in leaf spots on *Carica papaya* in India. Mycelial inoculation produced typical disease symptoms on leaves but no infection of papaya fruits. Single pynidiospore cultures produced perithecia, although the asci and ascospores were described as slightly larger than those produced on the host (Ullasa et al. 1974). Chau & Alvarez (1979) found that *P. caricae-papayae* cultures isolated from infected Papaya fruits in Hawaii produced perithecia typical of *Mycosphaerella caricae*, and ascospore inoculation produced fruit rot symptoms similar to *P. caricae-papayae*. Further support for the existence of a *Mycosphaerella* teleomorph was provided by Honda & Aragaki (1983).

The teleomorph connection remains controversial, however. It is not clear why some isolates cause leaf spots while others cause fruit rots, possibly an indication of the involvement of multiple fungal species. Also, *Phoma caricae-papayae* has been classified by Boerema (2004) in section Phyllostictoides, which has teleomorphs in *Didymella*, where known. Boerema (2004) lists a potential connection to a *Didymella* (*Mycosphaerella*) teleomorph but describes it as needing further confirmation. The European Plant Protection Organization map (I.M.I. 2004) states that "the taxonomy of [*P. caricae-papayae*] is confused, and the connection between *Phoma caricae-papayae* and the teleomorph *Mycosphaerella caricae* Syd. & P. Syd. is probably erroneous."

Plant Host

Phoma caricae-papayae:

The primary host is *Carica papaya*. *P. caricae-papayae* has been reported on other *Carica* spp. in Brazil (Mendes et al. 1998) and New Zealand (Pennycook 1989). Under the name *Phoma caricae*, it

has been reported on *Ficus carica* (Huseyinov & Selcuk 2001), but this is probably an error due to confusion caused by the name *Ascochyta caricae,* which has been used both for the fungus on *Ficus carica* (=*Ascochyta caricae* Rabenh. 1851) and the fungus on *Carica papaya* (=*P. caricae-papayae*).

Mycosphaerella caricae:

Carica papaya is the only known host. The Crop Protection Compendium (CABI 2005) lists *Corylus* as a host for *Mycosphaerella caricae* without supporting documentation; *Carica papaya* is the only host listed in the reference cited (Lim 1988).

Geographic Distribution:

P. caricae-papayae and its synonyms have been reported in Africa, Asia, Australia, New Zealand, Central America, and South America (I.M.I. 2004, Watson 1971, Boerema 2004). In North America it has been reported from Mexico (McGuire & Crandall 1967). It is common in Hawaii (Alvarez et al. 1977, El-Goorani & Sommer 1979, Raabe 1981, Honda & Aragaki 1983), but is not known to occur in the continental USA or Canada (I.M.I. 2004)*Mycosphaerella caricae* has a similar distribution, except that, in addition to Hawaii, it has also been reported in Florida (Alfieri et al. 1984, 1994).

Additional Literature

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Alvarez, A.M., Hylin, J.W., & Ogata, J.N. 1977. Postharvest diseases of papaya reduced by biweekly orchard sprays. Plant Dis. Rep. 61(9): 731-732.

CAB International, 2005. Crop Protection Compendium. Wallingford, UK: CAB International.

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El-Goorani, M.A., and Sommer, N.F. 1979. Suppression of postharvest plant pathogenic fungi by carbon monoxide. Phytopathology 69 : 834-838.

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McGuire Jr., J.U., and Crandall, B.S. 1967. Survey of insect pests and plant diseases of selected food crops of Mexico, Central America and Panama. Int. Agric. Dev. Serv., ARS, USDA, AID, 157 pages.

Mendes, M.A.S., da Silva, V.L., Dianese, J.C., and et al. 1998. Fungos em Plants no Brasil. Embrapa-SPI/Embrapa-Cenargen, Brasilia, 555 pages.

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Written by Erica Cline, October 12, 2005