

This short description was prepared in the framework of the EU FP7 project DROPSA - Strategies to develop effective, innovative and practical approaches to protect major European fruit crops from pests and pathogens (grant agreement no. 613678). This pest was listed in the DROPSA alert list for apple fruit.

***Colletotrichum fructicola* (Ascomycota)**

**Fruit pathway:** Yes. In laboratory tests, *C. fructicola* isolated from fruit lesions was able to infect wounded and non-wounded fruits and leaves of apple (Velho *et al.* 2015). Infections of fruit are mentioned amongst others for *Malus*, *Persea americana*, *Pyrus*, *Capsicum*.

**Other pathways:** plants for planting, cut plant parts, leaves.

**Hosts:** Polyphagous, hosts include *Malus domestica*, *Citrus reticulata*, *Fortunella margarita* (Huang *et al.* 2013), *Citrus sinensis*, *Gleditsia caspica*, *Sambucus ebulus* (Arzanlou *et al.* 2015); *Pyrus bretschneideri* (Jiang *et al.* 2014), *Pyrus pyrifolia* (Zhang *et al.* 2015), *Capsicum annuum* (new host; Shoji *et al.* 2015), *Coffea arabica* (Prihastuti *et al.* 2009), *Limonium sinuatum*, *Fragaria × ananassa*, *Persea americana*, *Ficus edulis*, *Dioscorea*, *Camellia sinensis*, *Theobroma cacao* (Weir *et al.* 2012), *Lycium chinense* (Paul *et al.* 2014).

**Distribution:** Asia: China (Jiang *et al.* 2014), Iran (Arzanlou *et al.* 2015), Japan (Shoji *et al.* 2014), Korea Rep (Paul *et al.* 2014), Thailand, Israel, Indonesia; North America: USA; Africa: Nigeria (Weir *et al.* 2012); South America: Brazil, Uruguay; Central America: Panama (Weir *et al.* 2012); Oceania: Australia.

Doubtful record: Germany (Weir *et al.* 2012). This record arises from one detection in a glasshouse in 1936 in botanical garden on a *Ficus edulis* leaf spot. No other record was found. The fungus is considered absent in Europe, with an uncertainty. Mainly a tropical and subtropical species (Phoulivong *et al.* 2012) that needs warm and humid conditions for host infections (Chatimbar 2016).

**Damage:** *C. fructicola* belongs to the highly aggressive *C. gloeosporioides* species complex causing Apple bitter rot (ABR) and Glomerella leaf spot (GLS) on *Malus domestica*. ABR symptoms are light brown fruit lesions which change their colour to dark brown while they enlarge and sunk v-shaped to the core into the apple. ABR is very destructive with up to 50% pre and post-harvest losses. GLS is an emerging disease (North and South America) which causes reddish-purple leaf spots, irregular necrotic lesions, yellow coloration of the leaf and finally leaf fall (Velho *et al.* 2015). *C. fructicola* is the dominant species that causes ABR in Uruguay (Alaniz *et al.* 2015). On *Pyrus bretschneideri*, *C. fructicola* causes black spots on young fruit, always followed by severe bitter rot on mature fruits (Jiang *et al.* 2013); market losses typically range from 60 to 90% (Li *et al.* 2013). On sweet pepper, it was found associated to a severe fruit rot (Shoji *et al.* 2014).

**Other information:** *C. fructicola* and related *Colletotrichum* species (*C. fiorinae*, *C. nymphaeae*, *C. siamense*, *C. theobromicola*) cause visually not distinguishable symptoms on apple (Munir 2015). *C. ignotum* and *Glomerella cingulata* var. *minor* are synonyms of *C. fructicola* (Weir *et al.* 2012). The Brazilian and Uruguayan populations are genetically distinct and differ in their abilities to infect leaves, when isolated from infected apples (Rockenbach *et al.* 2016). *C. fructicola* was intercepted several times to California with Chinese evergreen (*Aglaonema* sp.) from Costa Rica, a mango fruit shipment from Puerto Rico, *Cymbidium* orchid leaves, mango and black sapote fruits from Florida, *Dracaena massangeana* cuttings from Costa Rica (Chitambar 2016).

<b>Impact:</b> High	<b>Intercepted:</b> Yes	<b>Spreading/invasive:</b> Yes
---------------------	-------------------------	--------------------------------

**References:**

Alaniz S, Hernández L, Mondino P 2015 *Colletotrichum fructicola* is the dominant and one of the most aggressive species causing bitter rot of apple in Uruguay. Tropical Plant Pathology 40(4), p. 265-274.

- Arzanlou M, Bakhshi M, Karimi K, Torbati M 2015. Multigene phylogeny reveals three new records of *Colletotrichum* spp. And several new host records for the mycobiota of Iran. *Journal of Plant Protection Research*, 55(2), p. 198-211.
- Chitambar J 2016. California Pest Rating Proposal for *Colletotrichum fructicola* Prihastuti, L. Cai & K.D. Hyde, 2009. <http://blogs.cdфа.ca.gov/Section3162/?tag=colletotrichum-fructicola>
- Huang F, Chen GQ, Hou X, FuYS, Cai L, Hyde KD, Li HY 2013. *Colletotrichum* species associated with cultivated citrus in China. *Fungal Diversity* 61, p. 61–74.
- Jiang J, Zhai H, Li H, Chen Y, Hong N, Wang G, Chofong GN, Xu W 2014. Identification and characterization of *Colletotrichum fructicola* causing black spots on young fruits related to bitter rot of pear (*Pyrus bretschneideri* Rehd.) in China. *Crop Protection* 58, p.41-48.
- Li HN, Jiang JJ, Hong N, Wang GP, Xu WX 2013. First Report of *Colletotrichum fructicola* Causing Bitter Rot of Pear (*Pyrus bretschneideri*) in China. *Plant Disease*, 97(7), p. 1000.
- Munir M 2015. Characterization of *colletotrichum* species causing bitter rot of apples in Kentucky orchards. Theses and Dissertations, Plant Pathology Paper 18.
- Paul NC, Yu SH, Lee JH, Shin KS, Ryu TH, Kwon HR, Kim YK, Youn YN, Yu SH 2014. Endophytic Fungi from *Lycium chinense* Mill and Characterization of Two New Korean Records of *Colletotrichum*. *International Journal of Molecular Sciences* 15, p. 15272-15286.
- Phoulivong S, McKenzie EHC, Hyde KD 2012. Cross infection of *Colletotrichum* species; a case study with tropical fruits. *Current Research in Environmental & Applied Mycology*, 2(2), p.99-111.
- Prihastuti H, Cai L, Chen H, McKenzie EHC, Hyde KD 2009. Characterization of *Colletotrichum* species associated with coffee berries in northern Thailand. *Fungal Diversity* 39, p. 89-109.
- Rockenbach M, Velho AC, Gonçalves AE, Mondino PE, Alaniz SM, Stadnik MJ 2016. Genetic Structure of *Colletotrichum fructicola* Associated to Apple Bitter Rot and Glomerella Leaf Spot in Southern Brazil and Uruguay. *Phytopathology* 106(7), p. 774-781.
- Shoji K, Kurose D, Satou I, Yoshida S, Tsushima S, Tashiro N 2014. First report of *Colletotrichum fructicola* as a causal pathogen of Sweet Pepper Anthracnose in Japan. The 2014 Korea-Japan Joint Symposium, Plant Pathology Oct 2014.
- Velho AC, Alaniz S, Casanova L, Mondino P, Stadnik MJ 2015. New insights into the characterization of *Colletotrichum* species associated with apple diseases in southern Brazil and Uruguay. *Fungal Biology* 119, p. 229-244.
- Weir BS, Johnston PR, Damm U 2012. The *Colletotrichum gloeosporioides* species complex. *Studies in Mycology*, 73, p.115-180.
- Zhang PF, Zhai LF, Zhang XK, Huang XZ, Hong N, Xu W, Wang G 2015. Characterization of *Colletotrichum fructicola*, a new causal agent of leaf black spot disease of sandy pear (*Pyrus pyrifolia*). *European Journal of Plant Pathology* 143, p. 651.