JUL 17 Pathogen of the month – July 2017

Pseudoidium anacardii (Noak) *U. Braun & R.T.A. Cook* (citrus strains)

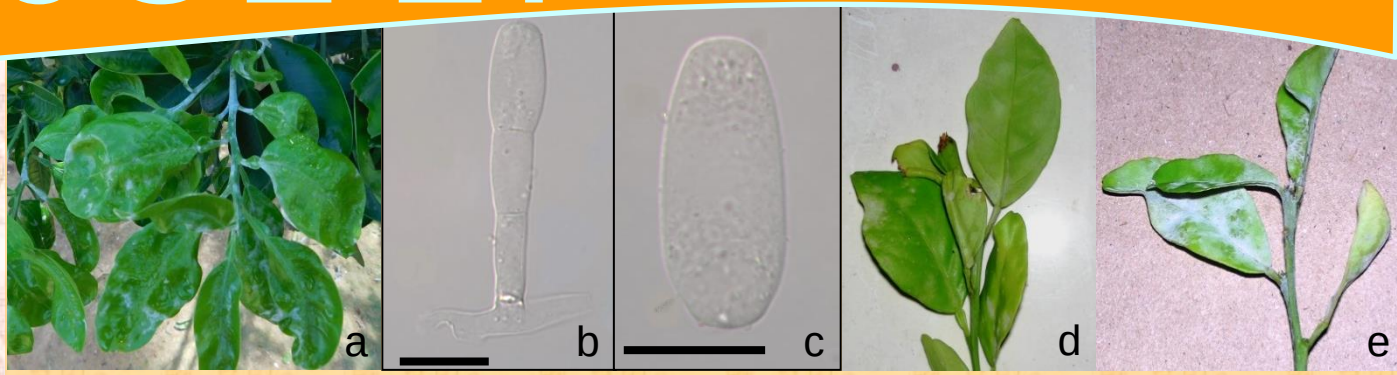

Fig. 1. Citrus powdery mildew (*Pseudoidium anacardii*). White powdery growth and deformed leaves (a), Conidiophore with condida formed singly (b), mature conidium (c), dense whitish powdery growth on young shoots (d and e). Bar = 20 µm. Photo credit: Richard Davis (a), Jane Ray (b,c,d,e).

Common Name: Citrus powdery mildew

Pathogen: *Pseudoidium anacardii* (Syn: *Oidium anacardii, O. mangiferae, O. bixae, O. erysiphoides* f. *bixae, O. citri, O. alphitoides* p.p.).

Classification: **K**: Eumycota (Fungi), **D**: Ascomycotina, **C**: Pyrenomycetes, **O**: Erysiphales, **F**: Erysiphaceae, **G**: *Pseudoidium*, **S**: *anacardii*

Note: Braun & Cook (2012) considered powdery mildews from several trees (*Hevea brasiliensis, Anacardium occidentale, Bixa orellana, Citrus* spp., *Mangifera indica, Acacia* spp. and *Quercus* spp.) as belonging to a single species named *P. anacardii* (tel. *Erysiphe quercicola*). It is unknown if there is host specificity among strains of *P. anacardii.* This species has been detected in Australia on mangos and *Acacia* spp. but not on *Citrus.* Studies on cross-infection host range are required. In the meantime *P. anacardii* on *Citrus* should be referred to as "citrus strains" (former *O. citri*), which is considered exotic to Australia.

Biology and Ecology:

All aerial parts of the plant are susceptible to infection characterised by dense whitish powdery growth on the surface (powdery mildew). Heavily infected trees can become defoliated whilst young fruit can become covered in mycelium causing them to abscise. Immature leaves may become deformed and young stems can become infected followed by stem dieback. The disease is most severe in humid subtropical areas, nursery's, shady or poorly ventilated orchids and on valley floors.

Distribution:

Citrus powdery mildew (*P.anacardii*) has been reported on citrus from Malaysia, Timor-Leste, Indonesia, Sri Lanka, Taiwan, Vietnam, Bhutan, India, Honduras and Antigua. The disease has the potential to spread easily by fungal spores in the wind or long distances on plant material.

Citrus Host Range:

Wide citrus host range although differences in susceptibility have been observed. *Citrus* spp. including *C. limon*, *C.sinensis*, *C. reticulata*, Rangpur lime (*Citrus x limon*), Carrizo citrange (*Citrus x insitorum*) and Tsunokaori tangor (*Citrus x aurantium*).

Impact:

Citrus powdery mildew caused by *P. anacardii* (citrus strains) is an important disease of *Ctrus* spp. *Fibroidium tingitaninum* is another powdery mildew pathogen of citrus, exotic to Australia.

Significant yield loss has been reported on mandarin (*C. reticulata*) from India, Vietnam and Bhutan. Up to 80% loss has been reported from untreated mandarin plants in Vietnam. Severe symptoms have also been reported on orange, Rangpur lime, Carrizo citrange and Tsunokaori tangor.

Management options:

Quarantine and phytosanitary measures are used to prevent the introduction and spread of the disease. Chemical sprays have been reported as effective in India.

Further Reading:

Braun U & Cook RTA (2012) Taxonomic manual of the *Erysiphales* (Powdery Mildews), CBS-KNAW, The Netherlands.

Limkaisang S, Cunnington J et al. (2006) Molecular phylogenetic analyses reveal a close relationship between powdery mildew fungi on some tropical trees and *Erysiphe alphitoides*, an oak powdery mildew. *Mycoscience* 47: 327–335.

Takamatsu S, Ito Y et al. (2015) First comprehensive phylogenetic analysis of the genus *Erysiphe* (Erysiphales, Erysiphaceae) I. The *Microsphaera* lineage. *Mycologia* 107:475-478

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