

Mycological Notes 24: Two Powdery Mildews on exotic and endemic hosts

Jerry Cooper, August 2013

Powdery Mildews (PM) are common on the leaves of various plants in summer. They are generally host specific, so if you know the plant, then you can identify the mildew. I wrote about some of these PMs on plants in my garden in [Mycological Notes 20](#).

***Erysiphe platani* on the London Plane tree**

The London Plane tree (*Platanus ×acerifolia*) is a common street tree in urban London. The hybrid arose from the mixing of North American and Spanish parents sometime before 1650. It was first established in the Oxford Botanic Garden by 1666, introduced to the Chelsea Physic Garden in 1731 and from there across the rest of London and beyond (Mitchell, 1986; Campbell-Culver 2001). It is tolerant of pollution and soil compaction and so makes an ideal street tree, but it also sheds its bark and so it is self-cleaning which was a virtue in sooty smog-bound streets of Victorian London. The tree is now widely planted around the world, including New Zealand.

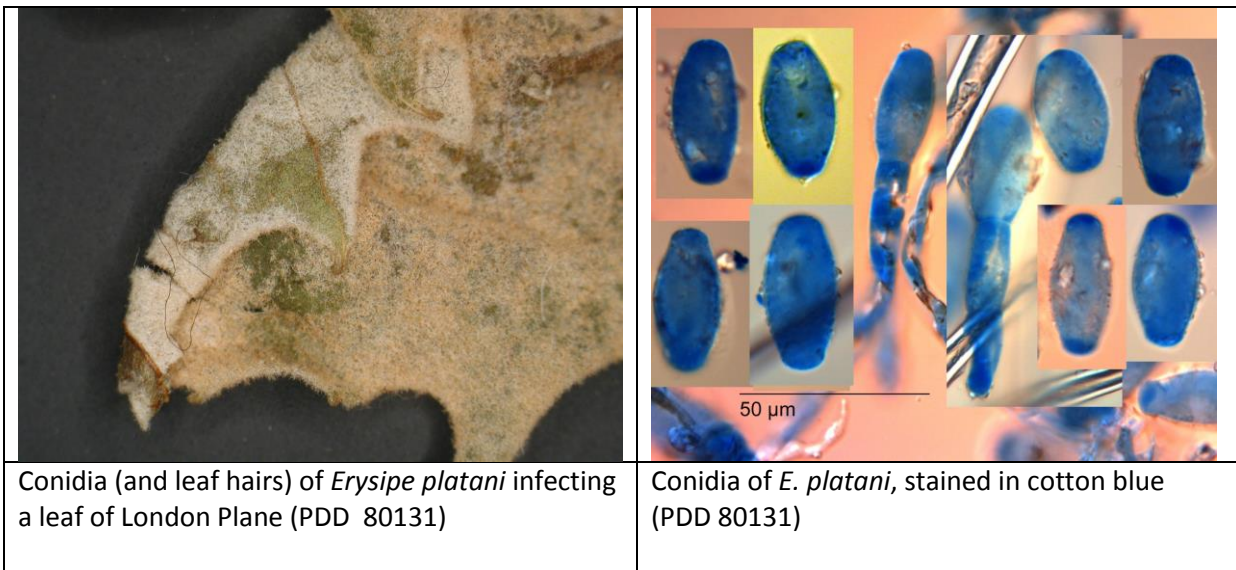
The powdery mildew *Erysiphe platani* originates in North America where it infects a few species of *Platanus*, including a parent of the hybrid. The mildew has spread from North America to infect these few *Platanus* species across the world. In the 1960s it was specifically noted on London Plane in Italy and spread on that species across southern and mid-Europe through the 1970s and 80s. I became acquainted with the fungus in the 1990s when I worked at the International Mycological Institute in Surrey. In 1990 the fungus was recorded in central London, then Surrey and some other sporadic records in the southern counties (currently just 9 records in total - [BMSFRD](#)). It follows the pattern of many PM introductions where the initial populations are represented only by the anamorphic (powdery) stage, and only much later after establishment is the sexually reproducing stage encountered. The sexual stage was reported in Europe as recently as 2003, a possible lag of more than 40 years (Pastirčáková & Pastirčák 2006).

In New Zealand I first came across the fungus in Christchurch Botanic Garden on London Plane in 2002 (PDD 80131) where it was causing considerable leaf-curl and leaf-fall to a number of adjacent trees. Only the anamorphic stage was present. I erroneously reported the fungus as a 'New Organism' to MAF, unaware that H.J. Boesewinkel had recorded it under the misapplied name *Microspheera alphitoides* on London Plane in Auckland in 1984. It is essential to use resources like [NZFUNGI](#) to establish the validity of New Organism records and in this case I didn't use the resource I was responsible for designing and building!

The actual distribution of the mildew in New Zealand is unknown. In Christchurch city it was certainly widely distributed by 2004. I have a recent record in the township of Lincoln (PDD 96152, 2011) where it was previously absent. All the records so far are of the anamorph stage.

My New Zealand collections of this fungus were recently requested for loan by Katarina Pastirčáková in Slovakia. Katarina has published papers on the spread of the fungus in Europe. It was recently recorded for the first time in Germany (Kirschner R. 2011) where the author speculates that the pattern of spread of both *Erysiphe platani* and the co-occurring Sycamore Lace Bug, may be a consequence of global warming.

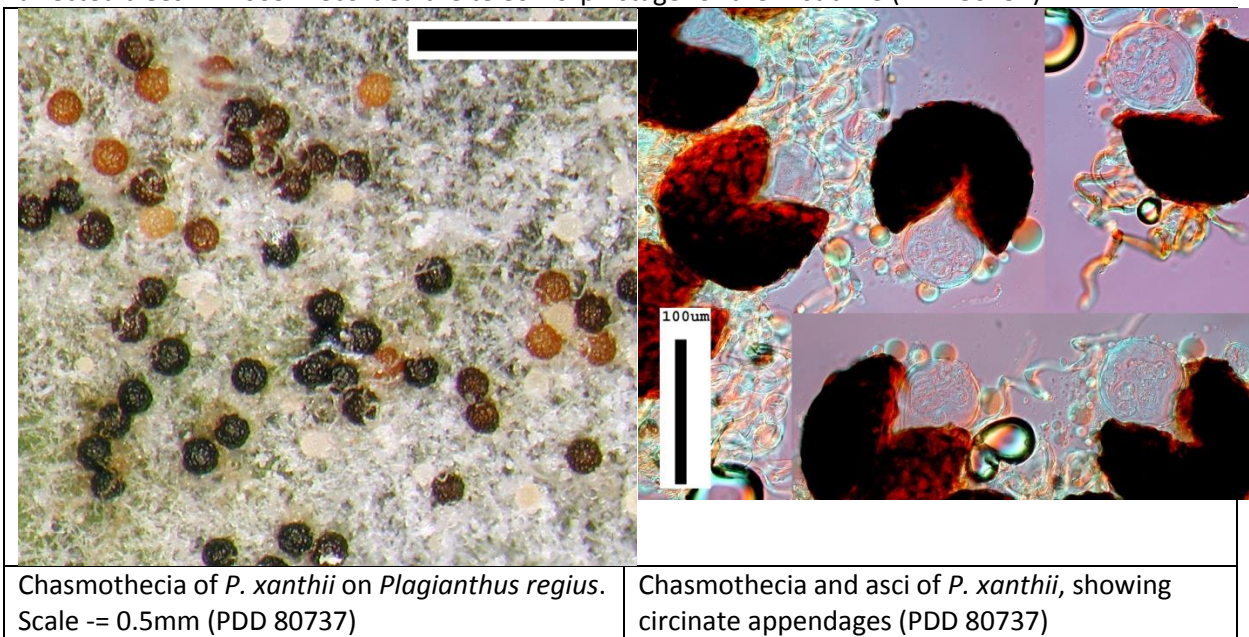
So, watch out Dunedin, your turn is next.



Podosphaera xanthii* on *Plagianthus regius

Since arriving in Christchurch in 2000 I have been aware of a PM on *Plagianthus regius*. In high summer many trees planted along riversides are heavily infected, resulting in leaf fall. The first record of a PM on *Plagianthus* was by Peter Heenan in Christchurch in 1990 (PDD 57193). Since then there have been a small number of records from the Christchurch area. A more widely distributed PM is also known on species of *Hoheria*. In 1992 Eric McKenzie recorded an *Oidium* on *Hoheria glabrata* in the Lewis Pass (PDD 64210) and, since 2000, there have been a few records of '*Sphaerotheca fuliginea*' on *Hoheria populnea* in Auckland. The two PMs may be related, or the same, because of the close relationship of *Plagianthus* to *Hoheria* in the *malvaceae*.

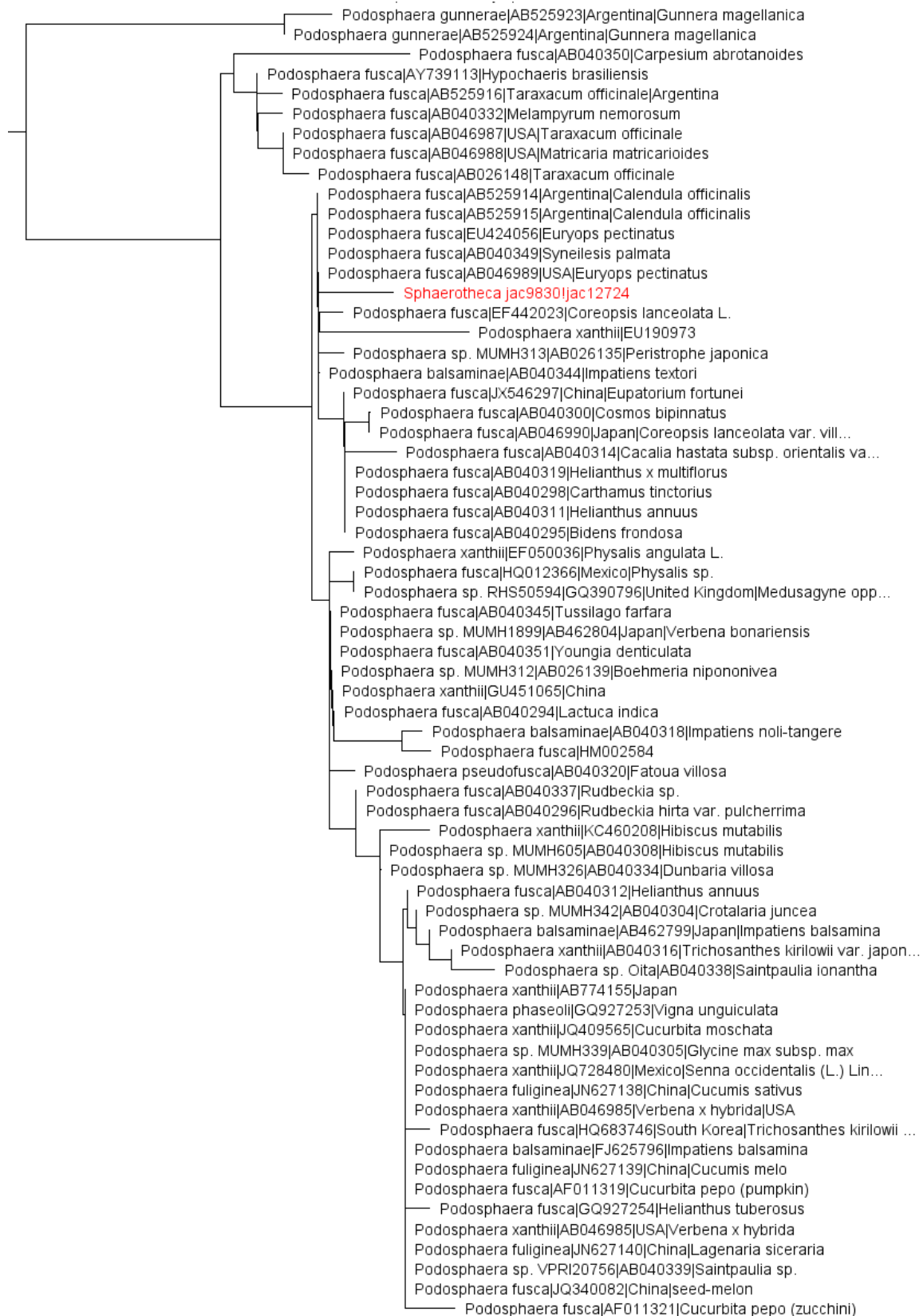
Initially all I saw on *Plagianthus regius* in Christchurch were conidia and so it was recorded as '*Oidium* sp.' which is the generic name for many of the PM anamorphic stage. The presence of only the anamorph made me suspect this might be a recent introduction, and so I continued to monitor affected trees. In 2005 I recorded the teleomorph stage for the first time (PDD 80737).



The presence of the teleomorph prompted a better investigation of the potential names. Globally the PMs recorded on species within the malvaceae are *Leveillula* spp and *Neoerysiphe galeopsidis* on *Alcea*, *Oidium albemoschi* on *Hibiscus*, *Oidium urenae* on *Urena*, *Erysiphe orontii* on *Hibiscus*, *Sphaerotheca fuliginea* on *Hibiscus*, *Sphaerotheca hibiscicola* on *Hibiscus*, *Podosphaera xanthii* on *Albemoschus* and *Brasiliomyces* on *Malvastrum* . The application of many of these names must be considered tentative as a consequence of misapplications and unrecognised synonym between PMs that aren't really host specific. It is only through recent molecular analysis that the true affinities and host specificity of many PMs is becoming understood.



The chasmothecia (the sexual fruitbody) in my material are around 125µm diameter with a single 8-spored ascus. The chasmothecia are attached to approximately 10 spiralling appendages. The morphology suggests a species of *Sphaerotheca*, which due to recent phylogenetic analysis, is now considered a subgenus with *Podosphaera*. The presence of spiral appendages led me to believe this was an undescribed species, and so a collection was submitted for sequencing for the ITS and LSU regions.



The sequence falls within the cluster of species referred to the *Podosphaera xanthii* complex. The latest treatment of powdery mildews by Braun (2012) considers a number of historic applications of names to have been incorrect including a number of names used for material in this clade. *Podosphaera fuliginea* is now considered to be restricted to species of *Veronica*, and *Podosphaera fusca* restricted to species of *Doronicum*. *Podosphaera xanthii*, by contrast, is considered to be a

species complex containing both host-specialised and plurivorous races. It seems highly likely that our PM on *Plagianthus* is one such plurivorous race which has spread from another host, perhaps also with a time-lag for the production of the teleomorph. However, the circinate hairs are not typical of *P. xanthii* and so there remains the possibility it should be recognised as an independent, and possibly host-specific taxon. As usual, further research is necessary.

References

Mitchell, A. A field guide to the Trees of Britain. 1986

Pastirčáková K, Pastirčák M. 2006 – The anamorph of *Erysiphe platani* on *Platanus hispanica* in Slovakia. *Mycotaxon* 97, 189–194.

Kirschner R. 2011 – Observations on *Erysiphe platani* in Germany, *Plant Pathology & Quarantine* 1(2), 115–119.

Braun, U.; Cook, R.T.A. *Taxonomic Manual of the Erysiphales (Powdery Mildews)*. CBS Biodiversity Series 11. 2012

Campebell-Culver, M. *The Origin of Plants*. 2004.