

The type-host species of *Puccinia cygnorum* re-determined as *Kunzea glabrescens* (Myrtaceae)

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Abstract *Puccinia cygnorum* is one of only two native Australian rusts known to occur on host plants of the family Myrtaceae. On the two collections known to have been made in Australia, including the type, the host species has been recorded as *Kunzea ericifolia* and *K. vestita*. Examination of these specimens, in the light of taxonomic revision of *Kunzea*, allows the re-determination of both as *K. glabrescens*.

Keywords Pucciniales · *Puccinia cygnorum* · Myrtaceae · *Kunzea*

The plant family Myrtaceae in the Australasian region shows a marked lack of associated indigenous rust fungi (order Pucciniales) as compared to the other main centre of myrtaceous diversity, the neotropics (Walker 1983; Shivas and Walker 1994).

In Australia, only two native rusts are known from myrtaceous hosts: *Physopella xanthostemonis* (J. Walker) J.A. Simpson, K. Thomas & C.A. Grgurinovic, recorded only twice from the Northern Territory on two species of *Xanthostemon*, and *Puccinia cygnorum* R.G. Shivas & J. Walker, in Australia recorded only twice on *Kunzea* hosts in the Perth region of Western Australia (WA). Black and white photos of the teliosori and teliospores of *P. cygnorum* are presented in Shivas and Walker (1994); a colour image of the teliosori is presented on the website of the Office of the Chief Plant Protection Officer (2010) (p. 35, Fig. 2.42).

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In the course of revision by one of us (ROM) of educational material (Makinson 2012) for a series of Western Australian training workshops on recognition of Myrtle Rust (*Puccinia psidii*), a need became evident for re-examination of the host species of *P. cygnorum* in the light of revisionary work on *Kunzea* by Toelken (1996).

Puccinia cygnorum first came to attention as an unknown fungus on cut foliage imported to New Zealand, where it was intercepted by the quarantine service. It was traced back to a source population in Spearwood, a suburb of Perth, WA, and a voucher collection of rust and host was made (*V. Taylor s.n.*, 13 October 1991). This collection was used as the basis for a teleomorphic species description of *P. cygnorum* by Shivas and Walker (1994), with holotype at the Western Australian Herbarium (PERTH 1359517) and isotype at the New South Wales Plant Pathology Herbarium (DAR 65768). The host species was recorded and published as *Kunzea ericifolia* (Sm.) Rchb. ex Heynh.

Subsequently, H.R. Toelken of the State Herbarium of South Australia published a partial taxonomic revision of *Kunzea* in Western Australia (Toelken 1996). In it, *K. ericifolia* was re-circumscribed as a species of the far south-west and south coast of WA, well south of Perth. All known populations of *K. ericifolia*, as now defined, are south of about latitude 33° S (Western Australian Herbarium 1998–), at least 120 km south of the known occurrences of *P. cygnorum*. A new species, *K. glabrescens* Toelken was erected by Toelken; this taxon includes the yellow-flowered *Kunzea* populations in the Perth area formerly regarded as *K. ericifolia*.

A second collection of *P. cygnorum* (PERTH 07650205) was made by I.C. Tommerup on 26 November 2002, about 14 km south-east of the type locality, in Jandakot Regional Park adjacent to the suburb of Wandii. The host species was recorded as '*Kunzea vestita* (formerly *ericifolia*)'. *K. vestita* Schauer (type: near King George Sound) is now regarded as a synonym of *K. ericifolia* subsp. *ericifolia* (following Toelken

1996: 46). The name *K. vestita* has been misapplied in some influential plant identification literature in the past (e.g. Blackall and Grieve 1980), including to the Perth-area populations now regarded as *K. glabrescens*.

Langrell et al. (2008: 690) utilised two accessions of *P. cygnorum* in a molecular study. One is sourced to the type collection. The other sample, coded as ‘E7401’, is not sourced to a voucher, but the associated details—collection date 2002, host ‘*Kunzea ericifolia*’—make it likely that it was sourced from the Tommerup collection noted above (PERTH 07650205). S.R.H. Langrell (pers. comm. 19 June 2013) confirms this as probable.

The host material included in the two known Australian voucher collections of *P. cygnorum* is in both cases adequate for confident identification—it includes foliage, inflorescences and infructescences. On current understanding of the taxonomy and distribution of south-west Australian *Kunzea*, the two *P. cygnorum* host specimens examined are clearly assignable to *K. glabrescens*.

In assessing the identity of the two *P. cygnorum* host specimens at the Western Australian Herbarium (PERTH) it was observed that the young stems (and leaves) were covered in long, straight, widely ascending to spreading hairs. This indumentum is discrepant with the description of *K. glabrescens* (Toelken 1996: 41) but consistent with the accompanying illustration and caption (*loc. cit.* p. 42), as well as with the spreading hairs shown on the host in the only semi-published colour photo of *P. cygnorum* (Office of the Chief Plant Protection Officer 2010), for which no voucher specimen is cited. Stem indumentum was found to be highly variable among the specimens assigned to *K. glabrescens* at herbaria PERTH and NSW, with the *P. cygnorum* host plants falling well within the range of variation. On other features the two host specimens conform well to both text and illustrations in the *K. glabrescens* protologue.

There appear to be few other published references to *P. cygnorum* and its hosts. Simpson et al. (2006), apparently working from the type specimen only, state that *P. cygnorum* “is only known from *Kunzea ericifolia* (Smith) Rchb. ex Heynh. growing in a coastal heathland site near Perth ... The host is native to Victoria (Hnatiuk 1990). This suggests the native host of the fungus is another Western Australian species of Leptospermeae or that it was introduced from Victoria.” This statement appears to be based solely on confusion in Hnatiuk’s *Census* between *K. ericifolia* (Sm.) Rchb. ex Heynh. of Western Australia, and *K. ericifolia* F. Muell., a later homonym for which *K. muelleri* Benth. is now the correct name. *K. muelleri* occurs in south-eastern Australia (New South Wales and Victoria) and has no connection with the Western Australian rust. There are no indications that either collection of *P. cygnorum* was made from plants not locally indigenous (e.g. introduced in bush regeneration programs), and the collector’s notes on *I.C. Tommerup s.n.*, 26/

11/2002, strongly suggest a natural population (she records that 500 plants were examined in a bushland reserve).

Dick and Inglis (2011) report a 2006 occurrence of *P. cygnorum* on nursery-sourced cultivated plants of the south-west Australian shrub species *Astartea fascicularis* (Labill.) DC. in the Napier Botanic Gardens, on the North Island of New Zealand. Eradication actions followed, and subsequent searches on Myrtaceae species in the area have not detected any further occurrence; *P. cygnorum* was declared eradicated from New Zealand in December 2010. We are unaware of any records of *P. cygnorum* on *A. fascicularis* in Australia, although the native distribution of the latter species overlaps strongly with that of *Kunzea glabrescens* and targeted searches would now be desirable. The fact that both the initial observation of *P. cygnorum* and this second host-species record were made in New Zealand speaks well for the biosecurity arrangements in that country.

In the light of a fairly high rate of taxonomic revision and nomenclatural change in many plant groups, the case of *Puccinia cygnorum* indicates a need for periodic review of host vouchers for plant pathogen collections. Databases of both botanical and mycological institutions are possibly now complete and compatible enough for routine searches, informed by recent botanical revisions, to be used to identify potential cases for investigation.

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