

Project 3.5 – Project Executive Summary.

Phylogenetic position of *Puccinia psidii* within the Pucciniales

Edward C.Y. Liew¹, Wolfgang Maier² and Marlien van der Merwe¹

¹The Royal Botanic Gardens & Domain Trust, Mrs Macquaries Rd, Sydney, NSW 2000, Australia

²Julius Kühn- Institut (JKI), National Research Centre for Cultivated Plants, Institute for Epidemiology and Pathogen Diagnostics, 38104 Braunschweig, Messerweg 11-12, Germany

Project Executive Summary.

The phylogenetic position of *Puccinia psidii* (guava rust, myrtle rust or Eucalyptus rust) within the Pucciniales, in particular its relationship with Pucciniaceae, was investigated. The study adopted a multi-step approach, which firstly included an extensive number of taxa covering 12 of the 13 currently known rust families and constructed a phylogeny based on sequences from the nuclear large subunit ribosomal gene (LSU). This phylogeny was then used to identify the phylogenetic affinities of *P. psidii* within the rust fungi. The nuclear small subunit ribosomal gene (SSU) was then obtained for these closely related taxa and, together with representatives from the Pucciniaceae and representative families, a combined two-locus phylogeny was derived. Finally partial coding regions of the β -tubulin 1 gene (β -tub1) were sequenced for a smaller sample of taxa to corroborate or contradict the LSU/SSU phylogenies. The results obtained clearly show that *P. psidii* does not belong in the Pucciniaceae. Its closer relatives include *Dasyscypha*, *Sphaerophragmium*, *Diorchidium*, as well as *Uredo baruensis* and *P. popowiae*. Since none of these genera are suitable systematic home for *P. psidii*, it is recommended that a new genus be erected to indicate that *P. psidii* is unambiguously phylogenetically distinct from representatives of *Puccinia s.s.*

The Final Report for this project is not available as manuscripts describing this work are in preparation. For further information, please contact Lead Researcher Dr Edward C.Y. Liew Edward.Liew@rbgsyd.nsw.gov.au