



KAURI (*AGATHIS AUSTRALIS*) UNDER THREAT FROM *PHYTOPHTHORA*?

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Kauri (*Agathis australis*), a conifer in the Araucariaceae, is a dominant tree of lowland forests in northern New Zealand. Following excessive exploitation for timber during the 19th and 20th centuries, it is today virtually restricted to reserves, where it is often regenerating vigorously. Giant individual trees, which can reach over 4.5m in trunk diameter and exceed 1000 years age, are accorded special status by Maori, Pakeha and tourists. Tane Mahuta ('God of the Forest') and Te Matua Ngahere ('Father of the Forest'), are major tourist attractions in Waipoua Forest, the largest remaining kauri stand in the country.

Two species of *Phytophthora* have been recorded from kauri in natural stands: *P. cinnamomi* and *P.* 'taxon Agathis' (PTA, first recorded as *P. heveae*). *Phytophthora cinnamomi* in New Zealand is culturally uniform and ITS sequences from 6 strains collected from diverse hosts at widespread locations were identical, consistent with the proposal that it is exotic to New Zealand. ITS sequence studies of PTA (GenBank EF067922, ICMP 16471 = ATCC 32256) show it belongs with, but is distinct from, *P. heveae* in the ITS clade 5 of Cooke et al. (2000). Morphological and molecular studies are underway to assess its relationship with the second named species in this clade, *P. katsurae*. It is our working hypothesis that PTA is also exotic to New Zealand, but insufficient isolates are yet available to determine whether genetic variability of this species provides support for this hypothesis.

Phytophthora cinnamomi, which is common in many natural stands, has been linked with ill-thrift and occasional tree death, especially in regenerating stands. PTA is associated with yellowing foliage, collar rot causing large bleeding lesions near the ground, and tree death. Until recently, it was known from a single isolated site on Great Barrier, a small offshore island. Recent surveys have found collar rot is widespread on the mainland. Typically, affected stands are relatively small in extent (less than one hectare) with numerous trees in the stand showing symptoms. Size class distributions indicate trees of all ages are affected and a disease front can sometimes be detected. Pathogenicity tests show PTA is highly pathogenic to kauri. It is not yet clear whether PTA affects other species.

We propose that collar rot caused by PTA is an emerging disease caused by an introduced pathogen which is spreading slowly from widespread disease foci. It poses a threat to kauri, both at the individual icon level and at the population level, with flow-on effects to kauri ecosystems.