Molecular characterisation of a *Phytophthora* hybrid swarm in native ecosystems and waterways in Western Australia

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Studies in native forests, woodlands and waterways in Western Australia (WA) have recovered several hundred *Phytophthora* isolates belonging to ITS clade 6. With the exception of *P. inundata* and two isolates of *P. megasperma*, none of the isolates recovered correspond to any described species. In a phylogeny of ITS clade 6 the majority of isolates cluster together within sub-clade II with *P. gonapodyides* as the basal species. Two new species, currently designated at P.sp.3 and P.sp.11, have been identified within the cluster. However, most other isolates contained obvious single base pair polymorphisms (between 2 and 20). The ambiguous positions are not random but are always among the 40 variable positions that can be found within the WA cluster. In addition, there were many isolates for which only partial sequence could be obtained. After cloning of the ITS region of several isolates, arrays of between 2 and 8 alleles have been found for each isolate, some containing indels (up to 7 bp throughout the ITS sequence) as well as single base pair polymorphisms. Subsequently the *cox*1 region has been cloned, and while some isolates which are polymorphic in the ITS region are monomorphic in the *cox*1 region, other isolates are polymorphic in both regions. These data provide evidence for extensive and common hybridisation and supports both sexual and somatic hybridisation events. The hybrids appear to be stable, as there is evidence in the ITS region of ongoing homogenisation through crossing over. These isolates belong to a hybrid swarm, the importance of which in the natural environment is unclear. The implications of these findings will be discussed.