

## **Microsatellites retain phylogenetic signals across genera in eucalypts (Myrtaceae)**

Ochieng, Joel W.; Steane, Dorothy A.; Ladiges, Pauline Y.; Baverstock, Peter R.; Henry, Robert J.; Shepherd, Mervyn

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### **Abstract**

The utility of microsatellites (SSRs) in reconstructing phylogenies is largely confined to studies below the genus level, due to the potential of homoplasy resulting from allele size range constraints and poor SSR transferability among divergent taxa. The eucalypt genus *Corymbia* has been shown to be monophyletic using morphological characters, however, analyses of intergenic spacer sequences have resulted in contradictory hypotheses- showing the genus as either equivocal or paraphyletic. To assess SSR utility in higher order phylogeny in the family Myrtaceae, phylogenetic relationships of the bloodwood eucalypts *Corymbia* and related genera were investigated using eight polymorphic SSRs. Repeat size variation using the average square and Nei's distance were congruent and showed *Corymbia* to be a monophyletic group, supporting morphological characters and a recent combination of the internal and external transcribed spacers dataset. SSRs are selectively neutral and provide data at multiple genomic regions, thus may explain why SSRs retained informative phylogenetic signals despite deep divergences. We show that where the problems of size-range constraints, high mutation rates and size homoplasy are addressed, SSRs might resolve problematic phylogenies of taxa that have diverged for as long as three million generations or 30 million years.