

Abstract

Phylogenetic Relationship among *Macadamia integrifolia* and *Macadamia tetraphylla* Wild Accessions [†]

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Two of Australia's endemic rainforest species, *Macadamia integrifolia* and *M. tetraphylla*, produce edible nuts with high-value kernel. The majority of commercial varieties are based on the limited gene pool of *M. integrifolia* and hybrids between *M. integrifolia* and *M. tetraphylla*. An understanding of the existing genetic diversity within the species can be utilized for future genetic improvement. Aiming to identify the genetic diversity, we conducted phylogenetic analyses of 98 wild accessions of *M. integrifolia* collected from 23 population sites, and 94 accessions of *M. tetraphylla* from 21 sites using 2,872 high-quality DArTseq-based SNP markers. The phylogenetic tree clearly distinguished clades of the two species. Within species, most of the accessions from the same population clustered together. Genetic and geographic distances among *M. integrifolia* populations were positively correlated ($r = 0.26$, $p = 0.01$), whereas the correlation was poor and not significant among *M. tetraphylla* populations ($r = 0.08$, $p = 0.13$). The relationship between genetic and geographic distance allows evaluating the relative influences of gene flow and drift on population structure within and between regions.



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