

**Genetic diversity and structure of Moreton Bay fig (*Ficus macrophylla*): Potential for genetic contamination of Lord Howe Island world heritage area.**



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Genetic contamination of natural populations through human dispersal of plants has the potential to erode or change the genetic diversity of wild plant populations. This is a concern for the Moreton Bay fig (*Ficus macrophylla*), which has two distinct forms, *macrophylla* found in eastern Australia and *columnaris* in Lord Howe Island (LHI). Here we undertook genetic analysis using microsatellite markers from nuclear DNA and chloroplast DNA sequences of mature trees sampled from across the entire known distribution of *F. macrophylla* from eastern Australia and LHI to determine the species' genetic structure and diversity. We went on to genotype trees with the *macrophylla* growth form found on LHI to confirm their origin, along with seedlings emerging on LHI to identify potential genetic contamination from pollen and seeds. Trees on LHI were clearly genetically distinct from those in eastern Australia, forming two discrete clusters in our analyses, validating the recognition of separate mainland and LHI forms. On the mainland, the northern population has the greatest genetic diversity and is most likely the ancestral population. The southern mainland population is connected with gene flow from the northern population through a series of intermediate populations along the east coast. In contrast, the low level of genetic variation detected in the LHI population suggest it has gone through a genetic bottleneck. The genetic identity of trees with *macrophylla* form on LHI confirm that they are planted trees of mainland origin. Given that we recorded high phenological overlap in reproductive stages between the two forms in co-planted trees in Sydney, and that they shared the same pollinator wasp, there appears to be no pre-mating barrier to genetic exchange between the two forms where they co-occur, e.g. planted *macrophylla* form and native *columnaris* form on LHI. Moreover, mainland nuclear and chloroplast variants were detected in some LHI seedlings, confirming genetic exchange via pollination to and from planted *macrophylla* trees on LHI. Given the world heritage status, high levels of endemism and unique biological processes on Lord Howe Island, preventing genetic contamination of endemic forms is an important environmental, social and economic issue.