Genomics Reveals the Introduction History of a Transformer Weed, *Passiflora foetida sensu lato*, in Australia

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Genomic analysis is a valuable tool for management of non-native invasive species, through determining source and number of introductions as well as levels of genetic diversity. *Passiflora foetida sensu lato* is native to central and south America with a current pan-tropical distribution. In northern Australia it is a transformer weed threatening tropical environments. We used whole chloroplast sequencing to investigate the introduction history of *P. foetida* in Australia and ddRAD to identify diversity in the introduced range. Phylogenetic analysis of chloroplast genome data identified three separate genetic lineages of *P. foetida* present in Australia, indicating multiple introductions. These introductions had affinities to samples from Ecuador, Brazil and the Caribbean that represent phylogenetically distinct lineages. These results provide a basis for a more targeted search of the native range of *P. foetida* for candidate biological control agents that have co-evolved with this species and are thus better adapted to the lineages present in Australia. Results also indicated that *P. foetida* and other introduced *Passiflora* species cultivated in Australia are in a sperate clade to the *Passiflora* species native to Australia. Analysis of samples from across the introduced range in northern Australia show predominance of one introduced lineage and generally very low genetic diversity within populations, except for a few populations where there is evidence for some crossing between lineages. This knowledge is important for targeting management, including any future deployment of biological control agents.