

Using stable isotopes to identify soil moisture sources of key species in drought-stressed riparian woodlands

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Remnant riparian woodlands on the Upper Condamine floodplain of the northern Murray-Darling Basin are characterised by the dominant canopy species *Eucalyptus camaldulensis* (river red gum), a facultative phreatophyte which preferentially accesses shallow groundwater sources during drought conditions. *Phyla canescens* (lippia), a perennial clonal herb, is also dominant in these ecosystems. Lippia is an invasive alien species, readily dispersed by flooding, with potential to spread throughout much of the Murray-Darling system with significant economic and environmental impact. Recent research indicates that trees may facilitate the persistence of lippia, enabling it to survive and reproduce under drought conditions, and that lippia may in turn contribute to dieback severity in canopy eucalypts in these woodlands. Greater understanding of the intensity and direction of interactions between these two species will contribute to the management of both lippia and tree condition in this landscape.

This research uses natural abundance stable isotopes to investigate the relative importance of water sources utilised by *E. camaldulensis* and *P. canescens* under low ambient soil moisture conditions. This approach will elucidate potentially important interactions between *E. camaldulensis* and *P. canescens*. It will also contribute to better understanding of the role of shallow groundwater resources in ecosystems subject to seasonal and long-term drought, and/or potentially at risk due to floodplain development and increasing climate variability.