# The distribution and evolution of flower size across the eucalypts

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The diversity of vertebrate pollinators in Australia, particularly songbirds, is often attributed to the ubiquity of eucalypt (*Eucalyptus*, *Corymbia* and *Angophora*) trees in Australian ecosystems. Eucalypt flowers produce copious nectar which feeds a diverse range of animal pollinators, and are themselves highly diverse with over 850 species. While most eucalypt flowers are relatively small, some eucalypt flowers can be very large (up to 10cm across), and it's thought that large eucalypt flowers are bird pollination specialists, while smaller eucalypt flowers are pollinated by a mix of insects, birds and mammals. Our study characterises the patterns of eucalypt flower size distribution and evolution. We predict that flower colour has co-evolved with flower size in eucalypts, with larger flowers also brightly coloured to attract bird pollinators. Given bird pollination often improves gene flow between small, isolated populations we also predict that larger flowers have evolved more frequently in range-restricted eucalypts. We combine data on eucalypt traits from an online flora (EUCLID), range size data from specimen geolocations and a recent molecular phylogeny of the eucalypts. Using models of correlated evolution we show that large, colourful eucalypt flowers have evolved more frequently in southwest than southeast Australia, and larger flowers occur in eucalypts with smaller ranges in the southwest but not the southeast. This will give us insight into the potential drivers of flower size evolution, and the distribution of vertebrate pollination across the Australian continent.

Biography:
Ruby E. Stephens is a plant ecologist whose fieldwork has taken her across Australia from the Kimberley to Kosciuszko. Her love of bees led Ruby to flowers and pollination for her PhD, which uses big data to ask big questions about flower ecology and evolution.