

Protecting living fossil trees

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Dr. Peter Prentis is using a new DNA sequencer to understand what makes certain tree species in Fiji rare. Credit: Erika Fish

Scientists are working to protect living fossil trees in Fiji from the impact of climate change with cutting-edge DNA sequencing technology.

Dr Peter Prentis, from QUT's Science and Engineering Faculty, said the findings would enable researchers to understand how [biological diversity](#) is generated.

"Fiji is a hotspot for biodiversity. Most of the species that occur in Fiji aren't found anywhere else in the world," he said.

"My project looks at how island species in these ancient groups of trees originated."

Dr Prentis will use \$150,000 DNA sequencer technology, called an Ion Torrent, to pinpoint genes in three pairs of [tree species](#): *Cynometra falcata* (critically endangered) and *C. insularis*; *Degeneria vitiense* (vulnerable) and *D. roseiflora*; and *Podocarpus affinis* (vulnerable) and *P. neriifolius*.

Dr Prentis said researchers would compare the vulnerable or endangered tree species with ones more commonly found in Fiji.

"We'll analyse each of the species pairs to find genes that have been important in the process of becoming unique. We're interested in how these [rare species](#) evolve," he said.

Dr Prentis said the research could predict how the trees will adapt to climate change.

"We need to understand how biodiversity is created in the first place to understand how to best conserve it in the future," Dr Prentis said.

"With [climate change](#) these species are going to have to respond to increasingly changing [environmental conditions](#) and an increase in [extreme events](#), such as cyclones.

"We don't know if these living fossil trees have the potential to adjust to these future environments."

The new Ion Torrent technology will accelerate research at QUT, enabling scientists to analyse tens of thousands of genes at the same time, compared to studying a handful of genes simultaneously with a standard DNA sequencer.

"What we can do in a couple of hours on the Ion Torrent is the equivalent of six months' work on a standard DNA sequencer," Dr

Prentis said.

The Ion Torrent, which can sequence whole microbial genomes and specific genes in species such as humans, insects and plants, will be used for health, agriculture and evolutionary research.

Dr Prentis' research, being conducted with Dr Gunnar Keppel from Curtin University in Western Australia, received \$40,000 of funding from the Australian Pacific Sciences Foundation.

A preliminary paper, Diversification history and hybridisation of *Dacrydium* (*Podocarpaceae*) in remote Oceania, was published in the *Australia Journal of Botany*.

Provided by Queensland University of Technology

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