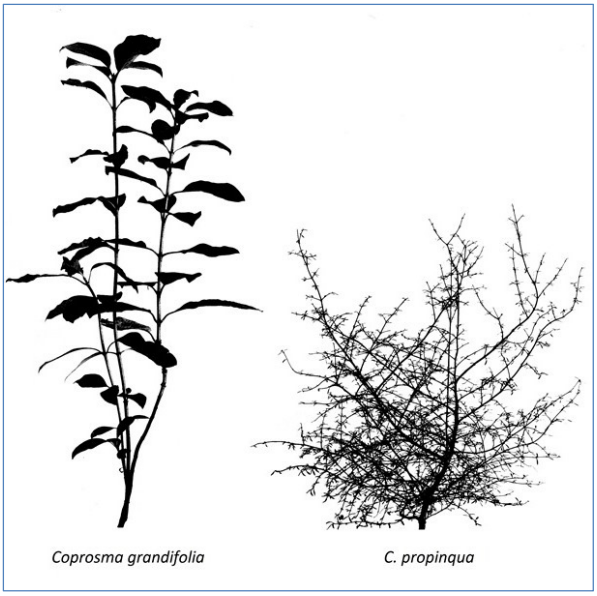
THE UNIVERSITY OF WAIKATO
Te Whare Wānanga o Waikato

PhD scholarship: Dating the evolution of the divaricate growth form in the New Zealand flora

The single most controversial feature of the New Zealand flora is the small-leaved, twiggy, tangled ("divaricating") growth form that has evolved locally in at least 17 different plant families. Prolonged debate about this remarkable case of convergent evolution has been polarized around two well-known hypotheses. First interpreted as a response to the Plio-Pleistocene onset of frosty droughty conditions, divaricate forms are now widely regarded as an anachronistic defence against large browsing birds (moa) that went extinct shortly after human arrival during the last millennium. Resolving this controversy is vital for understanding the status of divaricate plants in contemporary New Zealand, and for predicting the likely impact of browsing mammals and climate change on their future abundance and distribution.

The two hypotheses generate different predictions about the antiquity of the divaricate form in New Zealand. The ancestors of moa reached the New Zealand landmass > 60 million years ago; if moa browsing were the main driver of the evolution of divaricate plants, this growth form should have a long local history. In contrast, climatic explanations predict a much more recent origin, in response to Plio-Pleistocene global cooling, and the local development of frosty, droughty rain-shadow environments in the lee of the axial ranges.


Coprosma grandifolia *C. propinqua*

The successful applicant will determine dates of divergences of divaricate species from broadleaved relatives. You will extract, amplify and sequence DNA of divaricate and broadleaved plant species using massively parallel sequencing technology, and be trained in the analyses needed to reconstruct and date phylogenies. You will work with an interdisciplinary supervisory team including Chris Lusk of University of Waikato, and Rob Smissen of Landcare Research (Lincoln). The laboratory work will be carried out at Lincoln. This thesis topic forms an important part of a 3-year Marsden project recently funded by the Royal Society of New Zealand.

The scholarship provides a stipend of $27,500 plus enrolment fees per year for three years.

Are you eligible?

To be eligible for this opportunity you must have a BSc (Hons) or MSc degree, or equivalent. Background knowledge of evolutionary biology, molecular biology, plant genetics, taxonomy and systematics, statistical modelling, and bioinformatics would all be advantageous. International students may apply. The successful candidate will have excellent verbal and written English skills, as well as good organizational and communication skills. You will be able to work independently, enjoy new challenges and take pride in your own work.

How to Apply

Please send your CV and a one page expression of interest to chris.lusk@waikato.ac.nz, by 12 December 2016.