

Barcodes for trees: Study identifies genetic fingerprints of endangered conifers

November 29 2013



Podocarpus lambertii: This *Podocarpus* lives together with numerous epiphytes in the cloud forests of the Mata Atlantica in Brazil. It is listed as near-threatened in the Red List. Copyright: RUB, Credit: Knopf

In the tropics and subtropics, many evergreen conifers are endangered. Biologists at the Ruhr-Universität Bochum (RUB) have collected the world's largest Podocarpaceae collection. Together with colleagues from

The New York Botanical Garden, they sequenced characteristic parts of the DNA of these conifers in order to generate a "DNA barcode" for each species. With the help of this genetic fingerprint, unknown individuals can be assigned to the respective Podocarpaceae species, which are often very similar in appearance. Thus, individuals of endangered populations can be identified more easily. The team reports in the journal *PLOS ONE*.

Many Podocarpaceae are difficult or impossible to identify

"The distribution ranges of many Podocarpaceae are very small and often inhabited by only a few scattered individuals – unlike our native European conifer forests that cover large areas," says Dr Patrick Knopf from the RUB Department of Evolution and Biodiversity of Plants.

"There are only about ten individuals left of one species native to Fiji." In order to protect the few rare representatives of the endangered species, it is necessary to identify the species first. "In case of Podocarpaceae, it is difficult or even impossible to identify them only by their appearance," explains the RUB biologist Dr Christian Schulz.

"That's why we've launched the DNA barcoding project."

Propagating and exchanging of endangered species

The researchers from Bochum collected 320 individuals from 145 Podocarpaceae species on field trips to South America, South-East Asia, Australia, New Caledonia and Fiji. At the Botanical Garden's Pfizer Plant Research Laboratory, they worked with Garden scientist Dr. Damon Little to generate DNA barcodes for all of the individuals, which they subsequently provided on the online platform "GenBank". In addition, they created a living Podocarpaceae collection in the Botanic Garden of the Ruhr-Universität which promotes the protection of rare

and [endangered species](#). The Bochum team propagate the species and pass them on to other botanic gardens worldwide.

Relevance in the timber industry and cancer research

Podocarpaceae constitute the second-largest conifer family. They grow mainly in mountainous regions in the Southern hemisphere. The timber of many of the 198 species is of great economic interest because of its excellent insect and fungus resistance. Certain substances in their leaves, moreover, are playing an increasingly important role in [cancer research](#). The Red List of Threatened Species (IUCN) currently includes 27 Podocarpaceae species. In total, 86 [species](#) are endangered.

More information: D.P. Little, P. Knopf, C. Schulz (2013): DNA barcode identification of Podocarpaceae – the second largest conifer family, *PLOS ONE*, [DOI: 10.1371/journal.pone.0081008](https://doi.org/10.1371/journal.pone.0081008)

Provided by Ruhr-Universitaet-Bochum

Citation: Barcodes for trees: Study identifies genetic fingerprints of endangered conifers (2013, November 29) retrieved 26 April 2024 from <https://phys.org/news/2013-11-barcodes-trees-genetic-fingerprints-endangered.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.