

Revealing hidden extinction risk in Madagascar's rare plant species

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Deforestation around *Ravenea* palms in Eastern Madagascar. Credit: Romer Rabarijaona

For many species, there is a lack of information needed to make extinction risk assessments—a problem that is particularly acute in

biodiverse regions such as Madagascar. Scientists also fear that current methods of assessing extinction risk may underestimate the problem.

A new study has shown that easy to implement genomics methods could accelerate assessment of extinction risk in poorly studied [species](#), but the research paints a gloomy picture of the damage that has already been done.

Madagascar is renowned for its incredible biodiversity, and the island's plant species are no exception, but the pressures of the modern world are a threat to Madagascar's biodiversity. Many Madagascan species are "microendemics"—very rare species that are composed of small, isolated populations that occur nowhere else in the world. How so many of these microendemic species have evolved has remained a mystery.

A team of researchers from Bangor University and the Royal Botanic Gardens, Kew investigated whether these [rare species](#) have always been rare or if [human impacts](#), such as deforestation and extinction of large animals, have made them rare more recently.

The research, published in *Proceedings of the Royal Society B: Biological Sciences*, shows that many of the Madagascan microendemics have experienced rapid population declines since the arrival of humans on the island.



The endangered fan palm *Satranala decussilvae* was discovered by Kew botanists in 1991. There are 200 plants left in North-East Madagascar. Credit: William J Barker

A hidden loss of diversity

Alex Papadopoulos, senior lecturer at Bangor University explained: "This highlights that species which have not been assessed or are not considered as threatened may have experienced substantial population crashes in recent history. This hidden loss of diversity means that they may less able to deal with environmental change.

On a more positive note, we have shown that genomics can help to rapidly identify species that need urgent conservation intervention. This

could be an invaluable new tool in the conservation toolbox."



Slash and burn in the vicinity of Satranala populations. Credit: William J Barker

Dr. Bill Baker, senior research leader at the Royal Botanic Gardens, Kew said, "At Kew, we've studied the palms of Madagascar with our colleagues in-country for over 30 years and have discovered many wonderful species new to science. More than 80% of these are threatened with [extinction](#). For example, *Satranala decussilvae*, a massive forest fan palm, was discovered as new to science by Kew botanists in 1991, but is already rated as Endangered with perhaps only 200 plants left in North-East Madagascar. This study shows that

Satranala was much more abundant in the past and is in steep decline—it tells us that the time to act is now."

More information: Andrew J. Helmstetter et al, The demographic history of Madagascan micro-endemics: have rare species always been rare?, *Proceedings of the Royal Society B: Biological Sciences* (2021).
[DOI: 10.1098/rspb.2021.0957](https://doi.org/10.1098/rspb.2021.0957)

Provided by Bangor University

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