

Tubers in trouble

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Credit: Royal Botanic Gardens, Kew

Extinction by its very nature is irreversible. Once a species is extinct, it's too late for conservation practitioners to act. So, for us working on the front line of plant conservation, instead of just questioning whether a species is extinct, we need to look at the risk of extinction. Using assessments of extinction risk, we can uncover trends that help us to target the conservation resources we have available towards those species that need it most. The IUCN Red List of Threatened Species is one of

the most well recognised lists that documents the extinction risk of species.

This week, in its latest publication, the IUCN Red List will publish Kew's assessments of 41 [species](#) of Dioscorea, also known as yams, principally those in the genus that are only found in Madagascar and southern Africa.

It's thought that around 20 per cent of the world's plants are threatened with [extinction](#). While this level is shocking, our assessments of yams show that this group has around twice that level of risk, with over 40 per cent of the species we studied at risk of extinction.

Yams are an important food in Madagascar. They are usually eaten boiled and provide an important source of carbohydrates, fibre, potassium and a range of micronutrients. While cultivated varieties are available, much of Madagascar's rural community opt for eating wild yams. Rural families will harvest their own, while more urban communities may buy locally-sourced wild yams. They're an important food especially in the late dry season "hungry gap", when other foods like rice have been used up.

However, these yams are disappearing, with people reporting that they need to walk further and further to find yams to harvest. Over 30 yam species in Madagascar are only found there and, based on our assessments, many of these are likely to continue to decline if no action is taken.



Dioscorea irodensis harvested in Sahafary, Madagascar. Credit: Feno Rakotoarison

While the wild yams of southern Africa aren't often used as agricultural food crops, they do include some of the most unusual species in the genus and most of them form a distinct evolutionary lineage. The lineage contains unique diversity, including species with enormous above-ground tubers as well as non-twining species that can be found growing in grasslands. The risk of extinction in southern Africa is even greater than that in Madagascar; 44 per cent are at risk of extinction according to our assessments, mostly due to habitat decline – from overgrazing, agricultural changes and other land development.

The most distinctive and well-known species are those related to the elephant's foot yam, *D. elephantipes*. Their extraordinary form makes them agriculturally important, and *D. sylvatica* in particular (which is

assessed as Vulnerable) has been used as a source of steroids for the contraceptive pill and other medicines. This group also contains the fascinating *D. strydomiana*, harvested for its supposed cancer-curing properties, which is one of the most endangered yams anywhere in the world. There may be other life-saving properties, or opportunities to breed traits into cultivated varieties, from some of the species at risk. Our first priority though is to conserve them.



Malita yams (*Dioscorea maciba*) for sale at the market in Borziny, North West Madagascar. Credit: Paul Wilkin

Now we know the risks to both southern African and Malagasy yams, there is important work to do to ensure that we conserve these plants for future generations. Through funding received from the Darwin Initiative and the April Trust, Kew is working to reverse Malagasy yam declines.

We are supporting 85 separate Malagasy rural communities to cultivate edible and threatened wild yam species as crops alongside conserving them in living collections and seed banks. Currently we have 23 species in germplasm collections, 17 banked as seed and 12 in cultivation with communities. In the future, these collections could be used for future crop breeding programmes, pharmaceutical drug discovery or even to reintroduce plants to areas from where they have disappeared.

In South Africa, there are also numerous conservation initiatives involving yam species, in particular those of SANBI (South African National Biodiversity Institute) and other organisations.

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