



PRESS RELEASE

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RESEARCHERS' CAPTURES AFRICA'S TREE DNA

Barcoding is no longer a term only affiliated to consumer goods. Thanks to the research efforts made by Dr Michelle van der Bank of the University of Johannesburg (UJ) and a group of international scientists, who astounded the world then they identified the *matK* gene – a gene that distinguish between the majority of plant species on earth.

Now, UJ is playing a leading role in Africa as the continent's representative for an ambitious new project that will create a database of DNA information from the world's tree species. Known as *TreeBOL*, or tree barcode of life, the project will keep track of where tree species are located and whether they are at risk for extinction.

This campaign comprises of nine regional working groups, which represent the entire world. Dr Van der Bank and Olivier Maurin of the UJ's Department of Botany and Plant Biotechnology and Prof Adeniyi Jaeola of the University of Ibadan, Nigeria will be heading the regional working group for Africa.

"A section of the DNA would be used as a barcode, similar to way a product at the grocery store is scanned to view its price. But with plants and animals, the scanners look at the specific order of the four basic building blocks of DNA to identify the species," says Van der Bank adding that "the resulting database will help identify many of Africa's trees and the world's existing plant species, where they are located and whether they are endangered. The results are crucial for conservation and protecting the environment as population and development increases."

UJ will bring together scientists from all over Africa, and play a major role in helping to build scientific capacity in molecular techniques at the institution. "The ultimate goal is to establish a network of African scientists and institutes working in the field of DNA barcoding that will allow the University to take a leading role in international scientific campaigns."

The South African National Biodiversity Institute (SANBI) is the first organisation to commit to this African campaign. Researchers from SANBI will assist in the collection of samples of the estimated 1700 trees native to southern Africa. These samples will be deposited in the DNA Bank at UJ. The project will also assist SANBI to improve its electronic information base on South and southern Africa trees, and facilitate the expansion of its National Plant Collecting Programme.

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Why barcode trees?

Africa's forests are being inhabited by locals where it is customary law to use trees for firewood, fell trees for construction, and the use of forest products for food and medicine. As a result many tree species are being listed as critically threatened or endangered.

"Many tree species may become extinct even before they are discovered. If no drastic change in human behaviour occurs, and given the predicted climate changes, we can expect important modifications to the biosphere within the next few decades, which may cause the extinction of 1/3 of species on Earth by 2050," says Van der Bank.

Currently, more than 300 species of timber trees are protected or have been considered for protection by CITES. A number of tree ferns, cycads, palms, and columnar cacti are also CITES-protected tree species. Border control officials are often left helpless in monitoring illegal trafficking of products derived from CITES-protected tree species, which are difficult or impossible to identify using traditional taxonomic procedures for several reasons. Firstly the identification of immature trees is nearly impossible in the absence of flowers or fruits, and secondly tree species identification is even more problematic when those plants are cut, stripped of their leaves, and processed into lumber or other timber products. Living trees are also difficult to identify when one is presented with only fragments from an individual specimen. Each of these reasons provides an example from among many of the way in which accurate tools for tree identification might be used.

At present, one can use photographic guides to the leaves and/or bark of the tree species, field guides that may provide technical keys to the trees of an area, encyclopedias of timber cross-sections, and even collections of wood blocks to assist in the identification of trees. Each of these tools offers advantages to the user but also has its limitations. Because of these limitations, the development of a genetic-based tool for tree species identification would provide an unparalleled level of opportunity for scientists and consumers (e.g. commercial companies wishing to verify and guarantee the origin of their products). DNA barcoding is one such technique that is relatively simple to apply and yet can distinguish even between closely related species or strains.

In the long term, barcoding enthusiasts envisage something called a *barcoder*, a hand-held device that reads barcodes on the spot.

The first TreeBOL workshop will be held at UJ in October 2008. The aim of the workshop is to identify key species based on their conservation and trade status and also to establish partnerships between UJ and stakeholders.

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