

COURTESY OF THE PRESIDENT'S OFFICE, REPUBLIC OF MAURITIUS



Capitalize on African biodiversity

Under-exploited plants offer untold medical and economic promise that should be pursued, urges Ameenah Gurib-Fakim.

Artemisinin, ginkgolides, quinine, reserpine, scopolamine, paclitaxel. What do these molecules have in common? They are all extracted from plants and transformed into useful drugs, treating conditions including malaria, nausea, cancer and high blood pressure. None of the plants is from Africa.

Almost 60% of commercially available drugs are based on molecules derived from natural sources. Yet only 83 of some 1,100 blockbuster drugs of this type originate from Africa. Meanwhile, tropical and subtropical Africa has up to 45,000 plant species that may hold value for industry and humanity. This multitude represents at least 25% of the world's plant genetic resources.

With the appropriate infrastructure — technical, legal and regulatory — this treasure trove could translate into enormous wealth. In my view, this would create opportunities for Africa's youth. I have been laying the groundwork for that translation as an academic, documenting uses of medicinal plants, as an entrepreneur and, most recently, as president of Mauritius. My island nation of 1.3 million people lies in the Indian Ocean about 1,100 kilometres east of Madagascar. I was elected by parliament in 2015, and am charged with upholding Mauritians' fundamental rights and helping our institutions. I believe key to both tasks is our unique biodiversity.

China and India have dedicated efforts to exploit knowledge of traditional botanical resources. India has had a fully fledged ministry since 2014 to leverage its 3,000-year-old practice of Ayurvedic medicine and other indigenous medicine systems. As far back as the 1980s, the state administration for traditional Chinese medicine worked with the World Health Organization to document, in English, species commonly used in medicine.

Very few African countries have made similar efforts. And species are disappearing fast, owing to climate change, habitat loss, development and other pressures. The extinction rate on the continent is almost twice the global average. Mauritius and nearby islands are designated as biodiversity hotspots; yet almost 100 species have become extinct since the arrival of people in the seventeenth century, and only 2% of the native forest remains.

What's more, traditional information about the uses of plants is usually transmitted orally rather than formally catalogued, and recipes are considered trade and family secrets and so unlikely to be shared. As the African proverb states, an elderly person's death can be like a library burning to the ground. For too long, we have underestimated and undervalued the insight into our flora and fauna contained in this lore.

Documentation is crucial. As a professor of organic chemistry at the University of Mauritius, I started my career collecting traditional knowledge of locally used medicinal and aromatic plants and grew

to realize their huge economic potential. I became a co-founder of the African Association of Medicinal Plants Standards (AAMPS). The AAMPS is a network of dozens of researchers who came together to create the first *African Herbal Pharmacopoeia* — a scientific database of medicinal plants, and of tests to assess their chemical components and purity. A second volume will be published by 2018.

To commercialize this knowledge — to help it 'cross the valley of death' from lab bench to marketplace — I founded a start-up, the Centre for Phytotherapy Research (CEPHYR), in 2009. In 2015, this was rebranded as the Centre International de Développement Pharmaceutique (CIDP); it searches out innovative ingredients from our local products and brings them up to internationally recognized standards.

Many African plant products are showing promise. Standardized extracts of *Sceletium tortuosum* have been tested for their tranquillizing properties. The recipe came from the San people of southern Africa. An extract of the hoodia cactus-like plant, also long used by the San to control hunger, was explored as an appetite suppressant by Pfizer and Unilever. Other extracts of African plants — including nuts of the shea tree (*Vitellaria paradoxa*) and seed oil of the baobab (*Adansonia* spp.) — are used commercially in skin and beauty products.

These successes illustrate an opportunity to rethink Africa's development outside extractive industries. High-quality tertiary education and research would transform our capacity to build on these pockets of promise, as Brazil has shown. In addition, closer partnerships must be developed with philanthropy and the private sector. The CIDP emerged thus; it employs 200 people,

and is just one company. There is potential for many more.

Of course, such partnerships must be managed carefully, as I learnt the hard way. I found myself mired in controversy this year after I tried to forge links to build scientific capacity with a London-based charity — Planet Earth Institute, founded by the African businessman Álvaro Sobrinho. The charity has some internationally acclaimed trustees. After scholarships had been awarded to young Mauritians, I withdrew from this initiative following alleged concerns about the business operations.

But bumps in the road should not divert African nations such as mine from becoming producers of knowledge. African academics, funders and policymakers must begin to find new ways to nurture the talents and energy of our young people. Empowered with the latest technology, my hope is that innovators and entrepreneurs will develop a meritocratic culture. My dream is that biodiversity, soundly managed, will bring that sort of bounty to Africa. ■

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