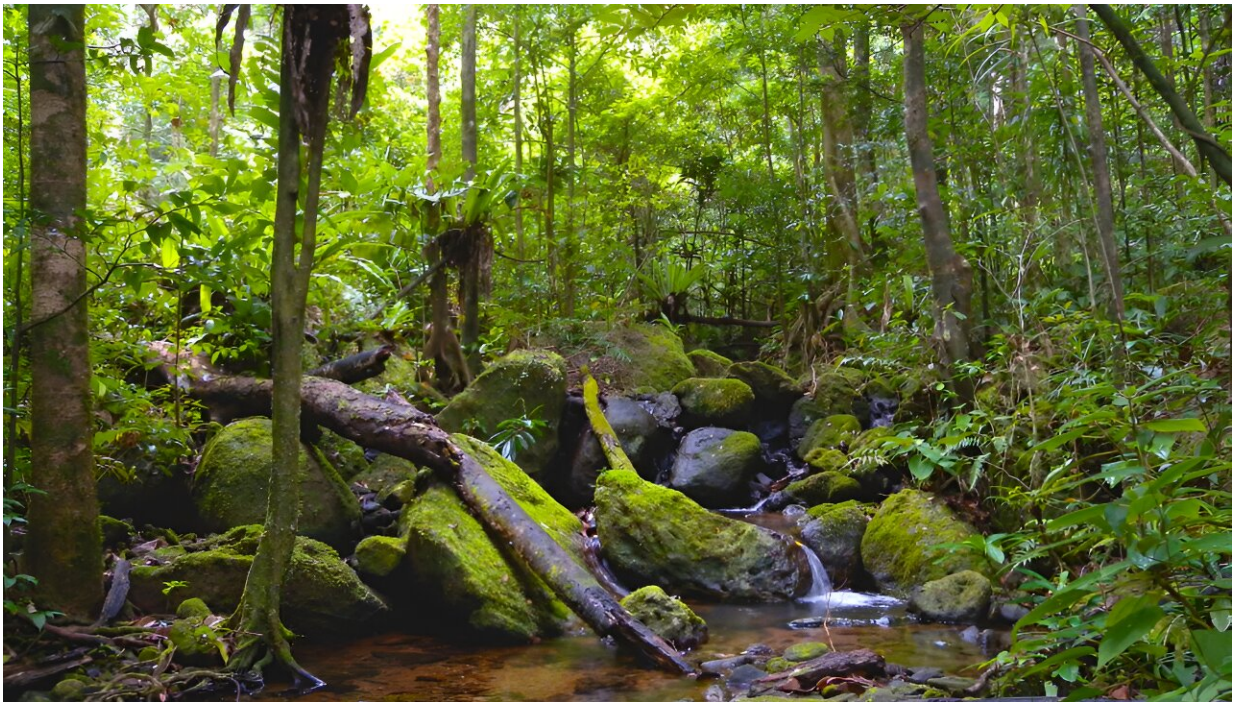


Q&A: AI sifts Africa's natural remedies for drug discovery

August 23 2024, by Ogechi Ekeanyanwu



Africa is home to a vast array of flora and fauna. Picture shows lowland rainforest in Masoala National Park, Madagascar. Credit: Wikipedia, [CC BY](#)

Artificial intelligence (AI) and traditional medicine may seem like strange bedfellows but African researchers are harnessing both to advance drug discovery on the continent.

Fidele Ntie-Kang, an associate professor of pharmaceutical chemistry at

the University of Buea, Cameroon, is spearheading attempts to develop [new medicines](#) from Africa's abundant natural biodiversity, using AI to screen hundreds of natural compounds.

In this interview with SciDev.Net, he discusses the constraints of carrying out research in Africa and how his team of researchers are overcoming these in efforts to find home-grown solutions to globally neglected diseases.

Can you tell us how you became involved in drug discovery?

Growing up in Cameroon, I frequently suffered from malaria and I vividly remember my father rushing to get [antimalarial drugs](#) like Fansidar. As I pursued my studies in chemistry, my interest in natural medicines—sparked by a high school experience with a doctor who taught us about the [medicinal plants](#) around our campus—grew into a passion for identifying less toxic treatments derived from Africa's own natural resources.

How significant are natural medicinal plants in Africa?

Traditional medicines play a crucial role in Africa, with more than 80% of the population relying on them. Africa is home to over 40,000 unique plant species, representing about 25% of the world's plant genetic resources. Out of these, more than 5,000 plants are used in traditional African medicine. These natural remedies are not just folklore; many contain unique molecules that have been used effectively in modern medicine, like quinine for malaria and salicylic acid for aspirin.

What is the current state of research on African

medicinal plants?

Despite the known effectiveness of some of these plants, there has been limited systematic exploration by pharmaceutical researchers. Most of the medicinal properties of these plants have not been isolated or studied and there are very few molecules from African natural products being developed into drugs. Yohimbine, derived from the bark of the African tree *Pausinystalia johimbe*, is one example that has been commercialized as a food supplement, though it comes with safety concerns.

What challenges exist in drug discovery from African natural products?

Drug discovery has traditionally been a complex, expensive, and time-consuming process, which has led to limited investment in exploring natural products from Africa. Additionally, there are infrastructural challenges, like frequent power shortages, which we've had to overcome by installing solar panels to ensure research continuity.

Because the scientific study of African natural compounds remains largely untapped, knowledge-sharing and capacity development are crucial for rapid advancement in the field. Yet, visa rules and requirements in the West make it difficult for African scientists and students to access training overseas and build collaboration with international partners.

These challenges have underscored the necessity of building our online natural compound database and ensuring it remains accessible to researchers across the continent.

Even simple resources to conduct research can be difficult to source. It can take weeks or months to get reagents supplied from Europe, where

these can be ordered online and received in a couple of days at much lower costs.

There is also the bias against bridging natural African compounds with pharmaceutical drug development. It's an uphill battle to convince potential partners and funders that Africa can have its own drug discovery centers and deliver cutting-edge research. But we are overcoming this—demonstrating our potential and publishing in high-impact journals.

How is AI changing drug discovery in Africa?

AI is changing this calculus. Traditional drug discovery involves understanding the structure of proteins in the human body or in a pathogen and painstakingly identifying molecules that can bind with or interact with them in desirable ways. Machine learning and AI allow us to dramatically short circuit this process.

The old approach of using physics-based methods...virtual screening of millions of compounds to look for a molecule with the right interaction with the drug target, may take weeks or months. With AI, we are able to screen millions of molecules in less than a day.

My research team at the University of Buea in Cameroon is establishing a state-of-the-art drug discovery regional center, which will screen and utilize 400 natural compounds from the continent in order to identify new antiviral drugs.

Using AI-supported techniques and working with an international, interdisciplinary team of biologists, chemists, geneticists, and computer scientists, we are adopting innovative screening techniques to identify [natural compounds](#) that may hold treatments for viral diseases such as COVID-19 and HIV.

What are you doing to support drug discovery efforts across Africa?

We are building an online database of compounds found in African natural products: fungi, plants, corals and bacteria. These compounds can be accessed by researchers around the continent who are searching for molecules that could be used to treat many diseases, like TB and malaria, including those that have been neglected historically by the global pharmaceutical industry. These diseases include chikungunya, trypanosomiasis, rabies, and schistosomiasis.

This [online platform](#) does not require any login, so our staff, collaborators and trainees can access all the data including free online tutorials. It aims to aid in the discovery of treatments for diseases that have been neglected by the global pharmaceutical industry.

What are the broader implications of your work for Africa?

By tapping into our own natural and human resources and applying new technologies like AI, we can develop homegrown solutions to our health care challenges. We are laying the foundation to ensure that Africa's wealth of natural plant medicine is fully utilized to address our public health needs and we're proving that Africa can be a leader in cutting-edge [drug discovery](#).

Provided by SciDev.Net

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