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Editorial

Ethnobotanical research in sub-Saharan Africa – documenting and analysing indigenous knowledge about medicinal, edible and other useful plants

Many people are aware that the African continent has a rich botanical and cultural diversity but the fact that there are still large gaps in the recorded indigenous knowledge about plants and their uses is less well known.

Oral-traditional knowledge probably dates back thousands of years and there is a risk that this precious information will become lost to future generations due to cultural changes. Several African countries are signatories to the Rio Convention and the Ngoya Protocol and committed themselves to recording, protecting and promoting indigenous plant use knowledge.

Ethnobotanical research has recently also become an important component of the concept of conservation. At the closing ceremony of the 19th International Botanical Conference in Shenzhen, China on 29 July 2017, the conference adopted a declaration that has the preservation of indigenous plant knowledge as one of seven priorities for strategic action in plant sciences (Crane et al., 2017).

"Priority 6 of the Shenzhen Declaration on Plant Sciences is quoted here: "To value, document, and protect indigenous, traditional, and local knowledge about plants and nature". Indigenous, traditional, and local knowledge about nature is disappearing even more rapidly than is biodiversity itself. Once lost, such knowledge, with its unique insights into nature, can never be regained. Plant scientists must work together with holders of this knowledge to understand and achieve sustainable environmental stewardship. Cultural diversity, coupled to crop genetic diversity, will be of central importance for future food security. We will need informed collaboration coupled with urgent, rigorous planning and implementation across cultures and knowledge systems."

This Special Issue of the *South African Journal of Botany* is not only aimed at making further contributions to the documentation of indigenous plant knowledge but also to create an awareness of the urgency of ethnobotanical research in Africa.

Forty papers (35 research papers and 5 reviews) are included in this Special Issue, covering a wide range of topics, from extensive ethnobotanical surveys to detailed studies of the medicinal and other properties of plants (only the first authors are given below).

The Special Issue has two general-interest papers to begin with, giving insight into the recent history of publications on medicinal ethnobotany and the more ancient history of plant use, based on archeological data. The one gives a detailed analysis of the role of the *South African Journal of Botany* in publishing medicinal plant studies in the period 1982–2017 (Viljoen). The other provides a perspective on ancient ethnobotany, comparing current plant uses in the Cape with plant remains from archaeological sites dating between 0 and 80,000 years BP (Botha).

The remaining 38 papers are grouped into the following 7 categories:

1. *General ethnobotanical surveys, including the entire range of plant uses*

The four papers provide detailed ethnobotanical data and inventories for Lesotho and the Free State (Moteetee), the Vhembe District (Magwede), Central Sekhukhuneland (Mogale) and Namaqualand (Nortje). These contributions all show that a substantial part of traditional knowledge has not yet been recorded in the scientific literature and that much basic research work remains to be done.

2. *Inventories of food plants and their uses*

The three papers in this category provide inventories and analyses of food plants for the entire southern African region (Welcome), indigenous fruits of Mapulana in Mpumalanga (Mashile) and medicinal uses of wild vegetables in the Vhembe district (Mokganya). It is noteworthy that the recorded number of edible species for southern Africa alone now exceeds the total number recorded by Peters et al. (1992) for the entire sub-Saharan Africa.

3. *Inventories of medicinal plants*

Surveys of the medicinal ethnobotany of four geographical regions in Africa are included here, namely for Mauritius (Suroowan), Tanzania (Hilonga), the Little Karoo (Hulley) and the Amandawe area of KwaZulu-Natal (Mhlongo). Once again, the scientific literature reveals a lack of systematic recording of medicinal plants. The total diversity remains unknown. Neuwinger (2000) recorded more than 5000 African medicinal species and their uses (with the Oceanic Islands included).

4. *Ethnobotanical studies of particular plant groups*

Detailed ethnobotanical data are given for Ethiopian medicinal trees (Yirgu), South African grasses (Gebashe), Tanzanian aloes (Amir) and Tanzanian *Hypoxis* species (Pereus). These papers all contribute important data for future comparative studies.

5. *Inventories of plants used for particular ailments*

Eight papers are included here – a detailed review of sub-Saharan plants used as aphrodisiacs and for sexual dysfunction (Ajao); a survey of plants used for cancer and related ailments in the Harari Region of Ethiopia (Bussa); plants used by traditional healers to treat

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HIV/AIDS-related diseases in Lusaka, Zambia (Chinsembu); plants used to treat sexually transmitted diseases in the Blouberg (Mathibela) and Wolkberg districts (Maema) of South Africa; those used by Bapedi healers to treat tuberculosis and infections in the Limpopo Province of South Africa (Semenya); cosmetic plants used in the Vhembe District (Ndhlovu); and an ethnoveterinary contribution, presenting a detailed inventory of plants used to treat gastrointestinal disorders of cattle in Benin (Ouachinou). Not much has yet been done to study the taxonomic and phylogenetic patterns of medicinal plants in relation to their traditional uses.

6. *Antimicrobial studies validating the traditional uses of selections of plants*

The five papers of this section deal with the traditional uses of plants, and how antimicrobial and other bioactivity tests support or validate indigenous uses. Included here are antimicrobial and acaricidal activities of plants from Reunion (Dorla); antimicrobial activities of plants used to treat sexually transmitted diseases in Maseru, Lesotho (Seleteng-Kose); antibacterial activity of medicinal grasses in KwaZulu-Natal (Gebashe); antimicrobial, antioxidant, photo-protective and anti-tyrosinase activities of plants used in traditional skin care (Thibane); and the antimicrobial and anti-quorum sensing activities of several plants used in treating urinary tract infections (Baloyi). In general, scientific studies support and explain the efficacy of remedies that have been discovered by trial and error over centuries.

7. *Studies dealing with the phytochemistry and ethnopharmacology of particular plant genera and species*

The 10 papers included here are arranged alphabetically by the generic names of the plants investigated. They deal with antifungal activity of volatiles from *Agathosma betulina* and *Coleonema alba* (Fajinmi); biological activities of extracts and isolated compounds from *Alhornea laxiflora* (Siwe-Noundou); the pharmacology and phenolic contents of *Aloe pruinosa* (Gebashe); antimalarial, antitrypanosomal and HIV-1 integrase inhibitory effects of *Antrocaryon klaineanum* and *Diospyros conocarpa* (Fouokeng); antimicrobial lupenol triterpenes from *Elaeodendron transvaalense* (Khumalo); antimicrobial and anti-quorum sensing activities of seven *Commiphora* species (Rubegeta); the use of *Lannea schweinfurthii* root bark hairs to induce forgetfulness (Magwede); antimicrobial activity of endophytic fungi from the roots of *Pelargonium sidoides* (Aboobaker); the effects of traditional fermentation on the alkaloid content of *Sceletium tortuosum* (Chen); and antimicrobial activity of extracts and isolated compounds of *Warburgia salutaris* (Khumalo). These papers demonstrate a wide range of opportunities that exist for making novel research contributions, especially when modern research methods are applied.

In general, all the contributions highlight the many unique research possibilities that exist in studying the ethnobotany of African plants. It is also clear that the oral–traditional culture of Africa has left a rich legacy of indigenous knowledge that has yet to be systematically recorded, let alone analysed. The large number of African scientists that have contributed to this Special Edition indicates that a new era has already dawned, in which local research capacity is rapidly developing. As more and more data become available, a much clearer picture is starting to emerge of the depth of knowledge that resides in Africa. It is becoming evident that there is a great urgency to record ancient knowledge and wisdom before it becomes lost to future generations. We hope that the diversity of ethnobotanical papers presented here will be useful to many scientists and that especially young African researchers will be inspired to record and analyse the fascinating and complicated human–plant interactions of the African continent, which all of humanity once called home.

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