Lessons from the past and message to the future generation

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4th South African Conference on Essential and Vegetable oils
Treasures of the past leading to the trophy of the future
Rosemary Hill, Mooiplaas (Pretoria district)
23-24 July 2026

SAEOPA
Southern African Essential Oil Producers' Association

NRF National Research Foundation

UNIVERSITY OF JOHANNESBURG

“Treasures of the past leading to the trophy of the future”

My own perspectives and experiences in Natural Product Development

Maximising the opportunities presented by our botanical and cultural wealth




60%+ endemism
22 000 species
7 biomes

Geographical advantage 1: **Botanical diversity**

Ecosystem services

Geographical advantage 2: **Cultural diversity**

Indigenous knowledge
Endemic languages
Oldest cultures

Expert systems — Automated data mining

Sustainable use — National symbols — Designs

Conservation — Literature — Transformation — Performing arts

Primary health care — Agriculture — Horticulture — Indigenous cuisine

Ecotourism — Bio-economy — New product development — New crop development — Education

Ecology | **Taxonomy** | **Ethnobotany**

xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx **BASIC SCIENCE** xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

The main themes of this review:

Botanical diversity – food plants, medicinal plants, essential oil plants

Cultural diversity – the key to unlocking the potential of aromatic plants

***Buchu*/*Son* – a southern African asset of global significance**

The role of books in stimulating commercial product development

Five phases of product development in South Africa

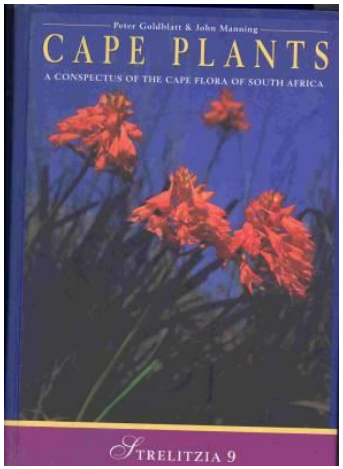
Examples of successful South African products

Conclusions

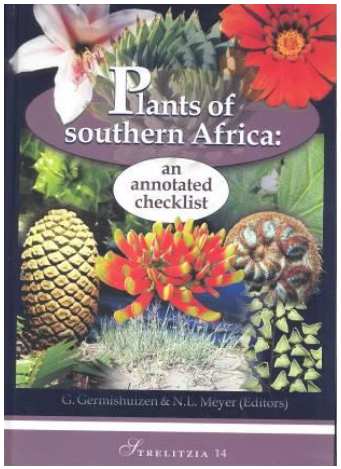
Botanical diversity – Taxonomic inventory

The South African flora with its high levels of diversity and endemism is a precious asset with much potential for new product development

Flora of the Cape:
ca. 9000 species
(8 888 seed plants, 112 ferns)

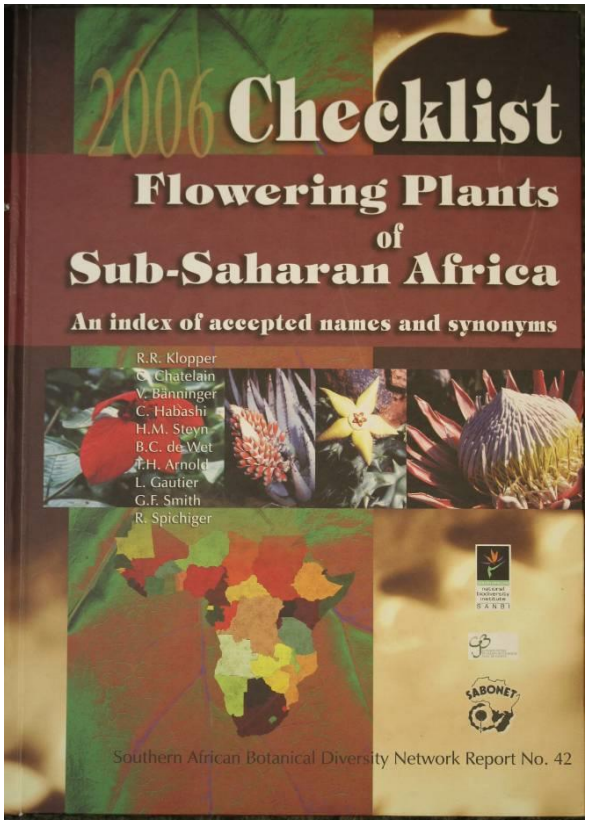


South Africa:
21 539 species
60.5% of indigenous species are endemic



Sub-Saharan Africa:
50 136 species
6763 genera

Tropical Africa: 32 424 taxa
Southern Africa: 22 755 taxa



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Contents lists available at ScienceDirect

South African Journal of Botany

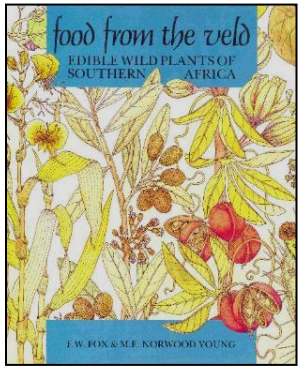
journal homepage: www.elsevier.com/locate/sajb

Taking stock of South Africa's flora

M. Marianne le Roux[a,b,*], Ronell R. Klopper[a,c]

[a] National Herbarium, Foundational Biodiversity Sciences Division, South African National Biodiversity Institute, Private Bag X101, Pretoria 0001, South Africa
[b] Department of Botany and Plant Biotechnology, University of Johannesburg, P.O. Box 524, Auckland Park 2006, South Africa
[c] H.G.W.J. Schweickerdt Herbarium, Department of Plant and Soil Sciences, University of Pretoria, Pretoria 0001, South Africa

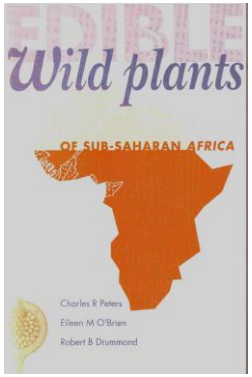
Botanical diversity – Food plants



New Food Plants? Edible plants / functional foods are not yet systematically recorded!

Fox and Norwood Young – 1983 ***"Food from the veld"***

About 800 edible plants recorded for the whole of southern Africa (including Zimbabwe, Zambia and Malawi)



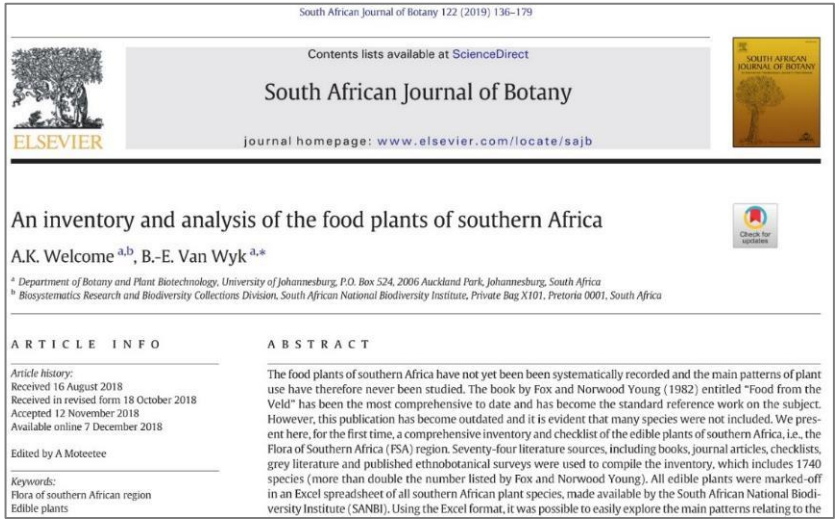
Peters et al. (1992) recorded 1714 edible species for sub-Saharan Africa

Ashton Ruiters-Welcome

PhD study (2019):

Food plants of southern Africa

Database of 1740 edible species (5% of the total flora)



South African Journal of Botany 122 (2019) 136–179

Contents lists available at ScienceDirect

South African Journal of Botany

journal homepage: www.elsevier.com/locate/sajb

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An inventory and analysis of the food plants of southern Africa

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[b] Biosystematics Research and Biodiversity Collections Division, South African National Biodiversity Institute, Private Bag X101, Pretoria 0001, South Africa

ARTICLE INFO

Article history:
Received 16 August 2018
Received in revised form 18 October 2018
Accepted 12 November 2018
Available online 7 December 2018

Edited by A Moteetee

Keywords:
Flora of southern African region
Edible plants

ABSTRACT

The food plants of southern Africa have not yet been been systematically recorded and the main patterns of plant use have therefore never been studied. The book by Fox and Norwood Young (1982) entitled "Food from the Veld" has been the most comprehensive to date and has become the standard reference work on the subject. However, this publication has become outdated and it is evident that many species were not included. We present here, for the first time, a comprehensive inventory and checklist of the edible plants of southern Africa, i.e., the Flora of Southern Africa (FSA) region. Seventy-four literature sources, including books, journal articles, checklists, grey literature and published ethnobotanical surveys were used to compile the inventory, which includes 1740 species (more than double the number listed by Fox and Norwood Young). All edible plants were marked-off in an Excel spreadsheet of all southern African plant species, made available by the South African National Biodiversity Institute (SANBI). Using the Excel format, it was possible to easily explore the main patterns relating to the

RESEARCH PAPER

Journal of Biogeography

WILEY

Spatial patterns, availability and cultural preferences for edible plants in southern Africa

Ashton K. Welcome[1,2] | Ben-Erik Van Wyk[1]

[1]Department of Botany and Plant Biotechnology, University of Johannesburg, Johannesburg, South Africa
[2]Biosystematics Research and Biodiversity Collections Division, South African National Biodiversity Institute, Pretoria, South Africa

Correspondence
Ben-Erik Van Wyk, Department of Botany and Plant Biotechnology, University of Johannesburg, P.O. Box 524, 2006 Auckland Park, Johannesburg, South Africa.
Email: bevanwyk@uj.ac.za

Abstract

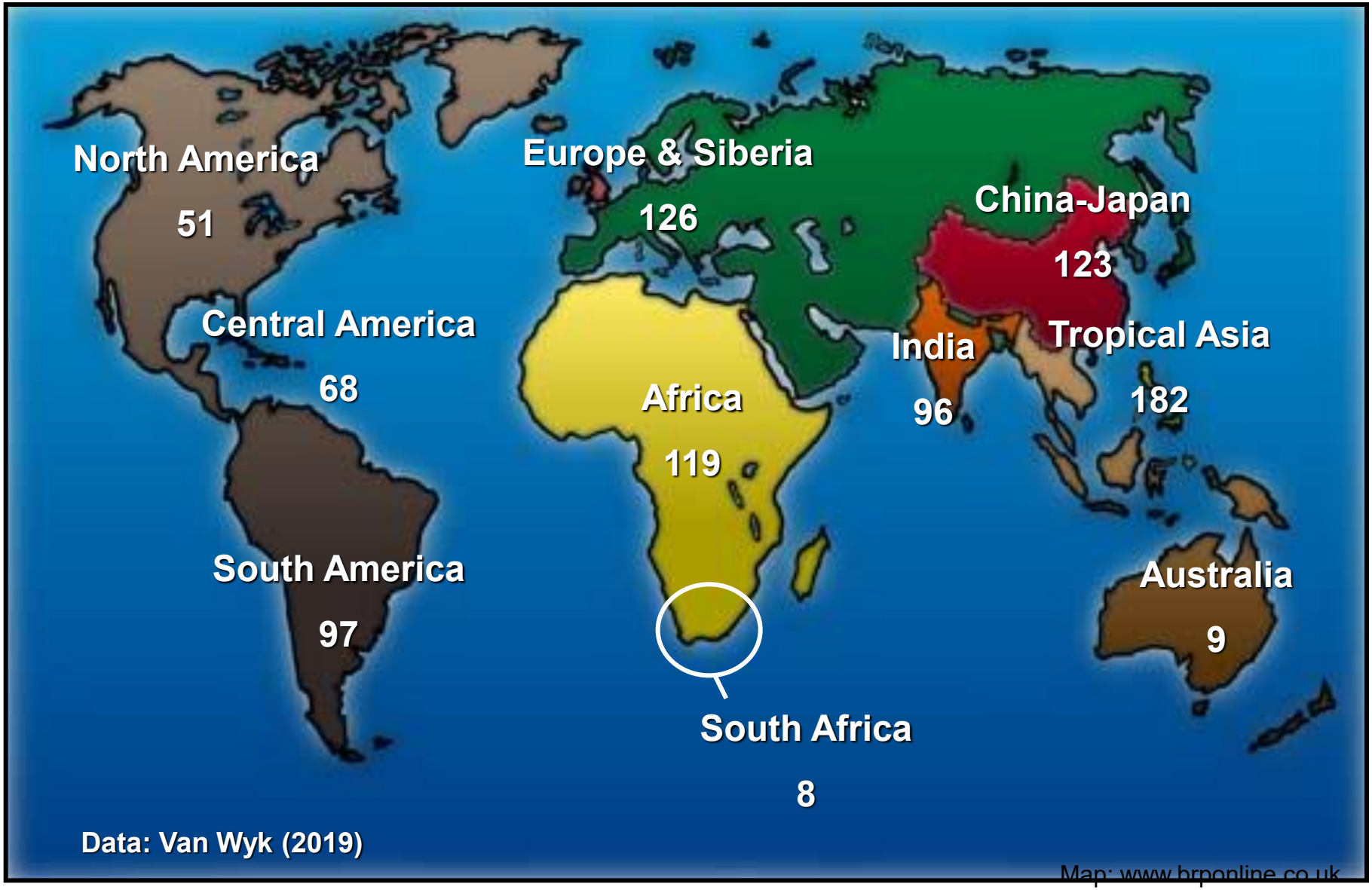
Aim: We investigated whether cross-cultural food plant selection in southern Africa is best explained by language ancestry, floristic environment or subsistence strategy.

Location: The flora of southern Africa region.

Taxa: All 1,740 edible plant taxa of southern Africa, representing 711 genera in 156 families.

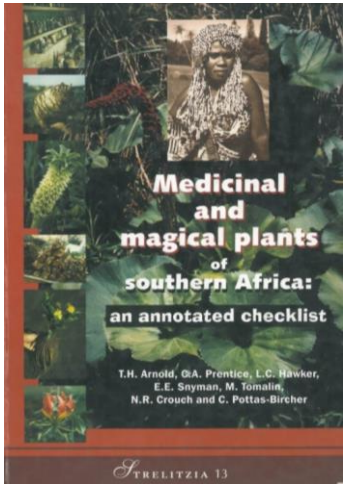
Methods: Distribution data of plants were overlapped in ArcMap with 19 language maps, eight biomes and all taxa with nutritional data. Six correlations were estimated between five pairwise distance matrices (language ancestry, geographical proximity,

BOTANICAL DIVERSITY - COMMERCIALISED FOOD PLANTS



Botanical diversity – Medicinal plants

New inventory of southern African medicinal plants (2024)



Arnold et al., 2002
Medicinal and Magical Plants of Southern Africa

2585 medicinal and ritual species that are actually used in South Africa

Ancia Cornelius

PhD thesis (2025), University of Johannesburg:

Database of 3784 medicinal and ritual plant species (16.4 % of the total flora) (1228 new species records)

Journal of Ethnopharmacology 332 (2024) 118361

Contents lists available at ScienceDirect

Journal of Ethnopharmacology

journal homepage: www.elsevier.com/locate/jethpharm

ELSEVIER

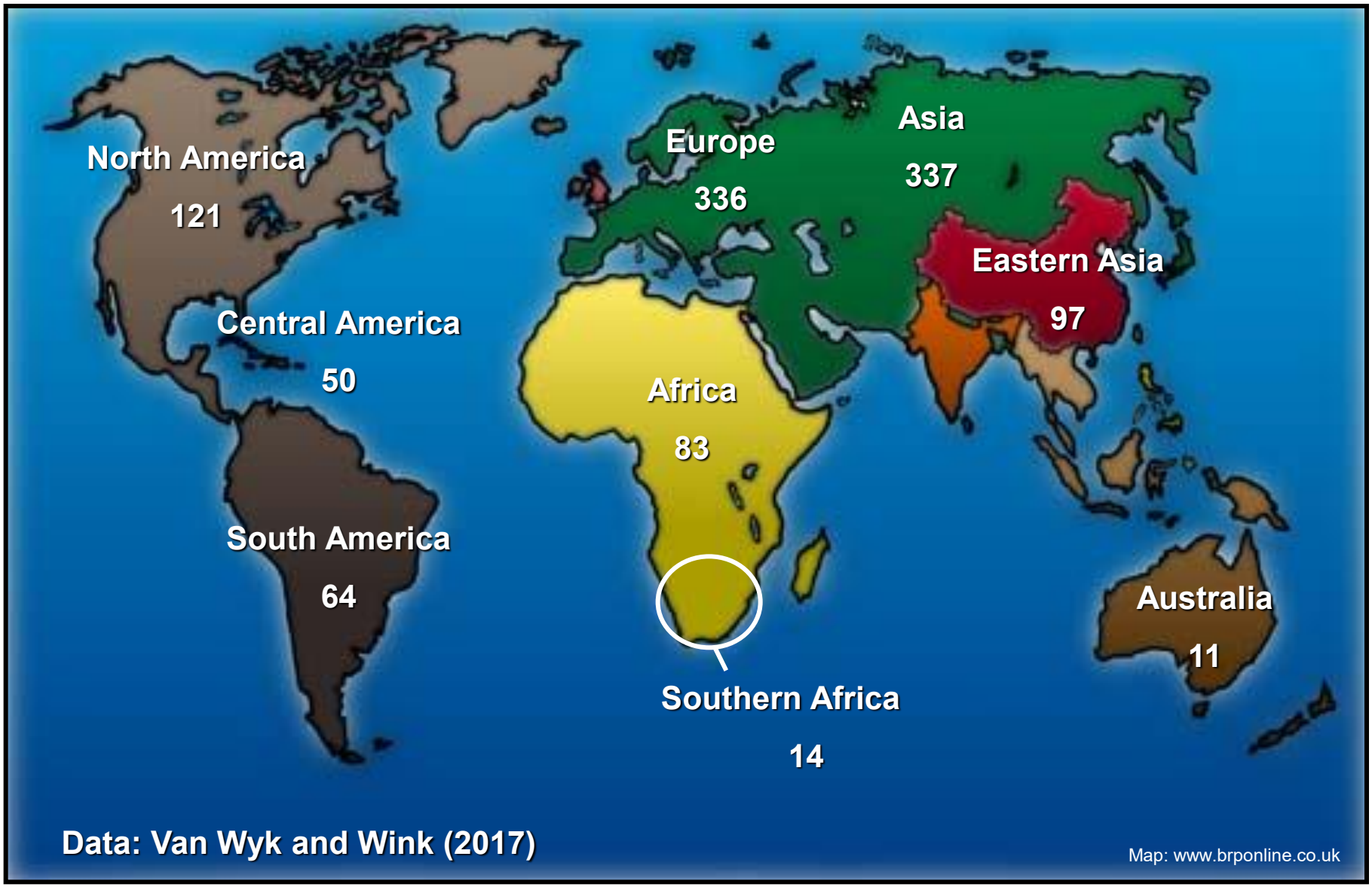
Check for updates

An updated inventory of medicinal and ritual plants of southern Africa

S.F. Cornelius, B.-E. Van Wyk *

Department of Botany and Plant Biotechnology, University of Johannesburg, P.O. Box 524, Auckland Park 2006, Johannesburg, South Africa

Botanical diversity – commercialised medicinal plants

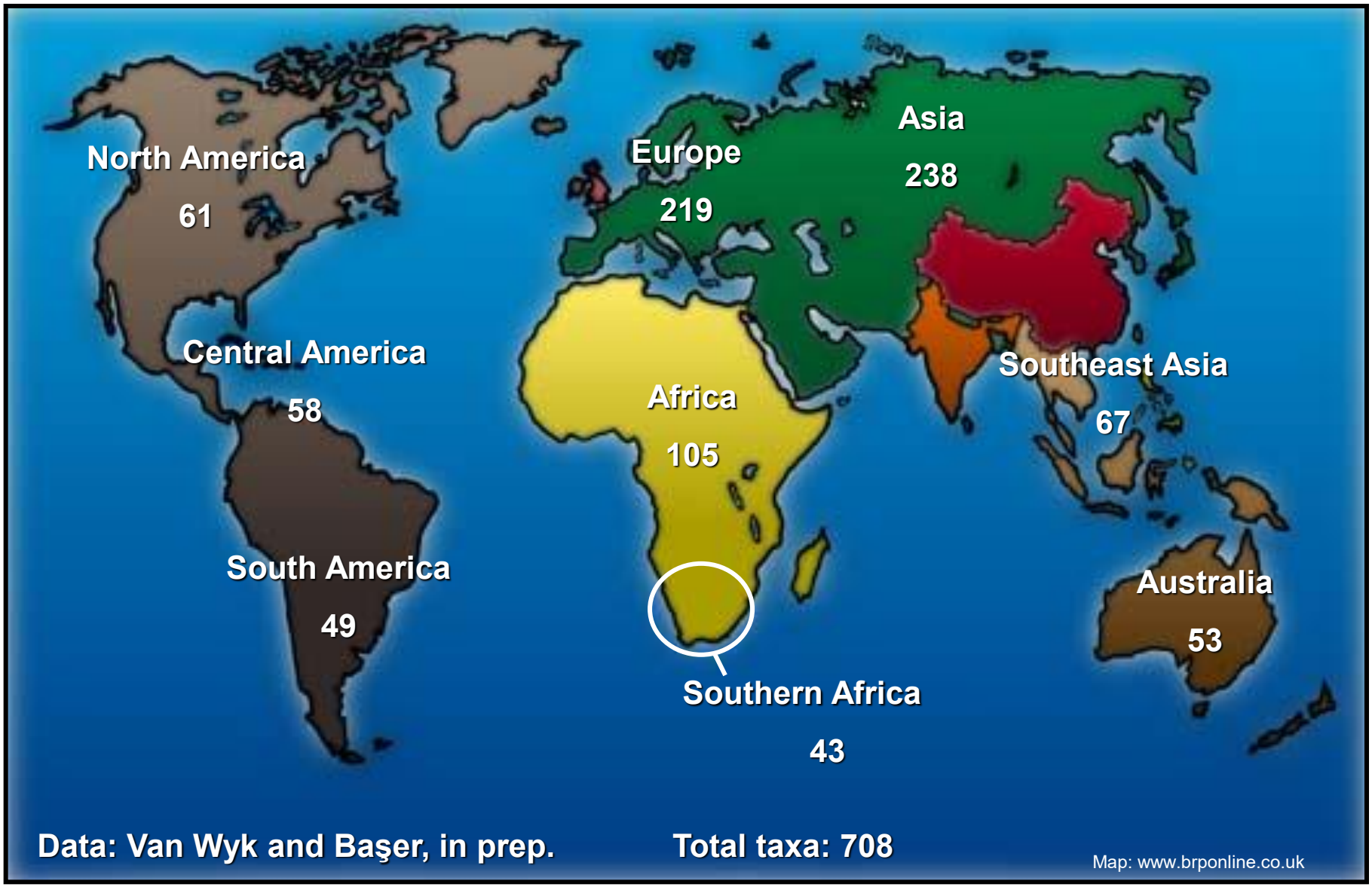


Botanical diversity – Essential oil plants

Inventory of commercialised essential oils – 708 species, 43 from RSA

No	Scientific name; family name; common name(s); trade name(s)
1	***Abies alba*** L. (Pinaceae); fir tree, silver fir, white fir, silver spruce, European silver fir, white spruce (silver fir oil)
2	***Abies balsamea*** (L.) Mill. (Pinaceae); balsam fir, Canadian balsam, American silver fir (Canadian fir needle oil)
3	***Abies concolor*** (Gordon & Glend.) Lindl. ex Hildebr. (Pinaceae); white fir (white fir essential oil)
4	***Abies grandis*** (Douglas ex D.Don) Lindl. (Pinaceae); grand fir, giant fir, lowland white fir, great silver fir essential oil)
5	***Abies sachalinensis*** (F.Schmidt) Mast. var. ***mayriana*** Miyabe & Kudô [=*Abies mayriana*] (Pinaceae); Sachalin fir (Japanese fir needle (oil)
6	***Abies sibirica*** Ledeb. (Pinaceae); Siberian fir (Siberian fir needle oil)
	Acacia caven - see *Vachellia caven* (Molina) Seigler & Ebinger
7	***Acacia dealbata*** Link (Fabaceae); silver wattle (**mimosa absolute**)
8	***Acacia decurrens*** (J.C.Wendl.) Willd. (Fabaceae); green wattle (**mimosa absolute**)
9	***Achillea erba-rotta*** All. [=*A. moschata* Wulfen] (Asteraceae); simple leaved milfoil, iva, musk yarrow oil)
10	***Achillea ligustica*** All. (Asteraceae); : southern yarrow, Ligurian yarrow (Ligurian yarrow oil).
11	***Achillea millefolium*** L. (Asteraceae): common yarrow, milfoil, nosebleed, thousand leaf (yarrow oil)
12	***Achillea tenuifolia*** Lam. [=*A. santolina* L.] (Asteraceae)
13	***Acmella oleracea*** (L.) R.K.Jansen [=*Spilanthes acmella* var. *oleracea*]; Brazilian cress (jambu oil, jambu extract, spilanthes oil)
14	***Acorus calamus*** L. var. ***angustatus*** Besser [=*Calamus aromaticus* Garsault]: sweet flag, calamus (calamus oil calamus root essential oil)
15	***Adesmia boronioides*** Hook.f. (Asteraceae); paramela (paramela essential oil)
16	***Aeollanthus myrianthus*** Baker subsp. ***gamwelliae*** (G.Taylor) Ryding [=*Aeollanthus gamwelliae* G.Taylor (Lamiaceae); ninde (ninde oil)
17	***Aetoxylon sympetalum*** (Steenis & Domke) Airy Shaw (Thymelaeaceae); white oud, gaharu buaya, crocodile eaglewood (white oud oil)

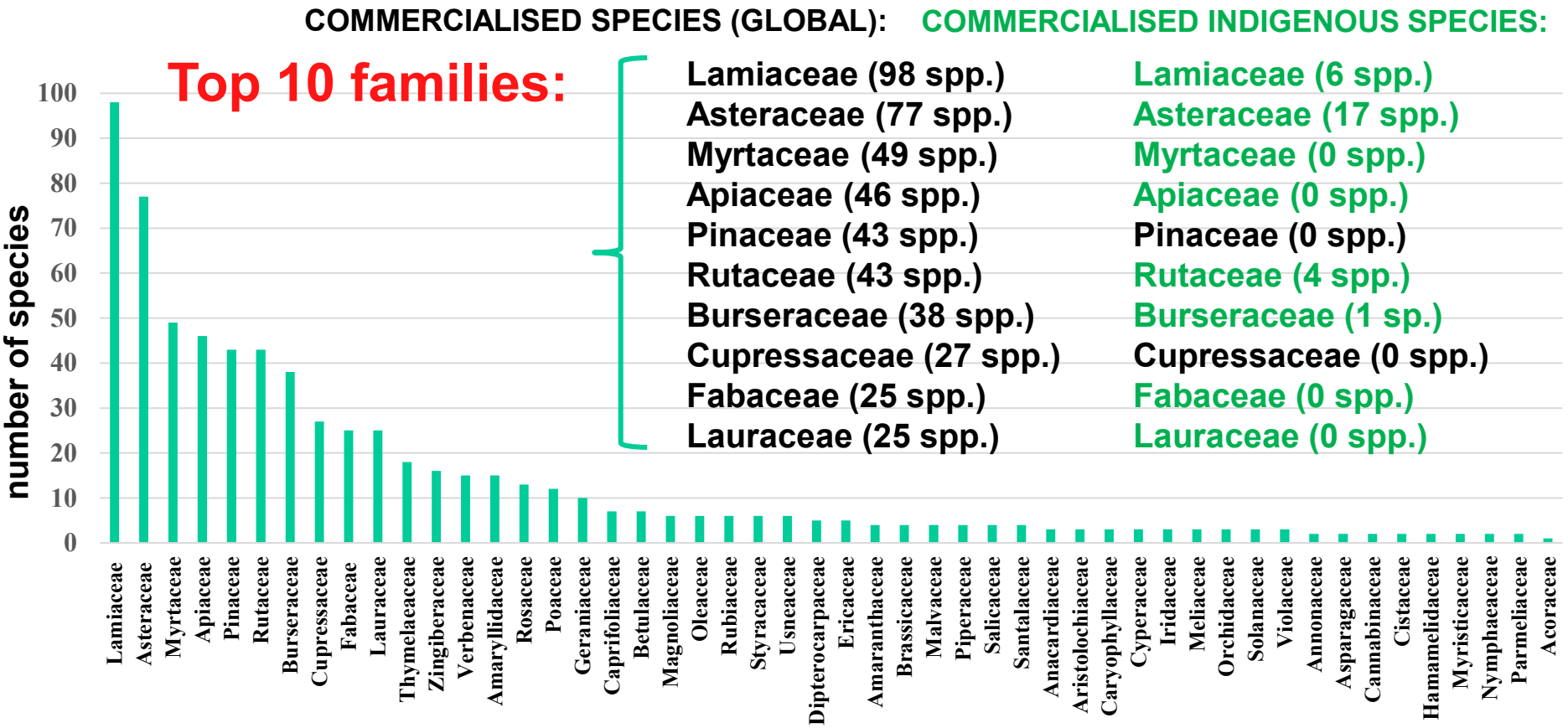
Botanical diversity – commercialised essential oil plants



Diversity at family level – top 50 commercial essential oil plant families

Habit: Tree vs shrub vs herb? Ecological preference (where will it grow well)? Is there a market?

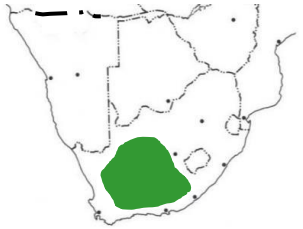
Priority families: Lamiaceae (*Salvia dentata*?); Asteraceae (*Stoebe rhinocerotis* as SA frankincense? *Artemisia afra*?); Apiaceae (anise root, *Annesorhiza* spp.? *Foeniculum*?); Rutaceae (*Diosma* spp.? many candidates!, poorly studied); Burseraceae (38 spp.), *Commiphora* spp.? – South African myrrh?); Fabaceae (25 spp., 0 in South Africa, *Vachellia erioloba*? – African oud?, mimosa absolute?)



Cultural diversity – Southern African is a global focal point for aromatic plants ("buchu", "son")

Trial and error over 160 000+ years of cultural evolution and selection (in a biodiverse region) resulted in profound plant product concepts

Cape !Xam (San hunter-gatherers; Sonqua, "bushmen") of the Karoo are the most ancient lineage of modern humans.



Our studies showed that *!Xam* medicinal knowledge was incorporated into the other cultural groups that migrated to southern Africa in the last 2000 years

IMPORTANCE OF AROMATIC PLANTS IN SOUTHERN AFRICA

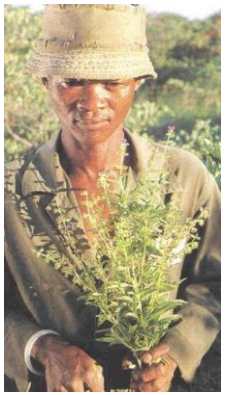
Ancient African origins

***"Bushmen"* means**

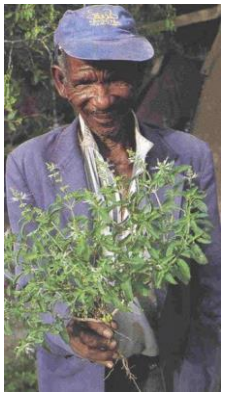
"aromatic bush people",

i.e., the people (*qua*) who habitually anoint their bodies with aromatic bushes (*san* or *son or buchu*)

The *Sanqua* or *Sonqua* (Bushmen) are named after aromatic plants



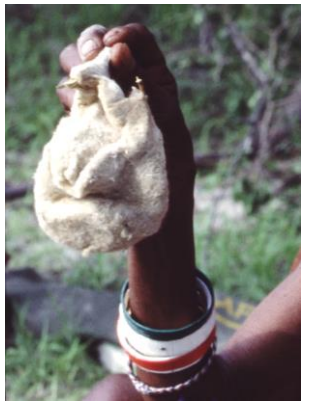
"male" buchu (*Syncolostemon bracteosus*)



"female" buchu (*Ocimum filamentosum*)

San healer women (Central Kalahari)

***San* or *Son* (*Pteronia onobromoides*)**



Bird nest and tortoise shell as a containers for *buchu* powder

IMPORTANCE OF AROMATIC PLANTS IN SOUTHERN AFRICA

Ancient African origins

"…. !nkaou is rare and valuable, and a thimbleful is worth from a sheep to an ox.
It is obtained in mountainous districts…"

(Laidler, 1928, recorded in the Kamiesberg)

Buchu (round-leaf buchu, !*nkaou*)

Round-leaf buchu – *Agathosma betulina*

IMPORTANCE OF AROMATIC PLANTS IN SOUTHERN AFRICA

There are more than 50 species of buchu in southern Africa

a selection of *son* / buchu plants used by San and Khoi people

round-leaf buchu/
!*nkaou*
Agathosma betulina

oval-leaf buchu
Agathosma crenulata

long-leaf buchu
Agathosma serratifolia

buchu, *bokboegoe*
Diosma hirsuta

haasboegoe
Diosma aspalathoides

boegoekaroo
Pteronia adenocarpa

!*noraboegoe*
Pteronia aspera

boegabos
Pteronia divaricata

san or son
Pteronia onobromoides

ghwarrieson
Pegolettia baccharidifolia

IMPORTANCE OF AROMATIC PLANTS IN SOUTHERN AFRICA

Earliest publications on buchu and its uses by San and Khoi people

Kolbe (1719)

Title page of Kolb (1719)

Spiraea Africana Odorata in Kolbe (1719)

Thunberg (1799)

Title page of Thunberg's *Dissertatio Botanica de Diosma* (1799)

***buchu* (*Diosma hirsuta*)**

Simon van der Stel (1685)

Facsimile edition, 1979

Page 206: *San* or *Son* (*Pteronia onobromoides*)

Commelin (1692, 1706)

Spiraea Africana Odorata in Commelin (1706)

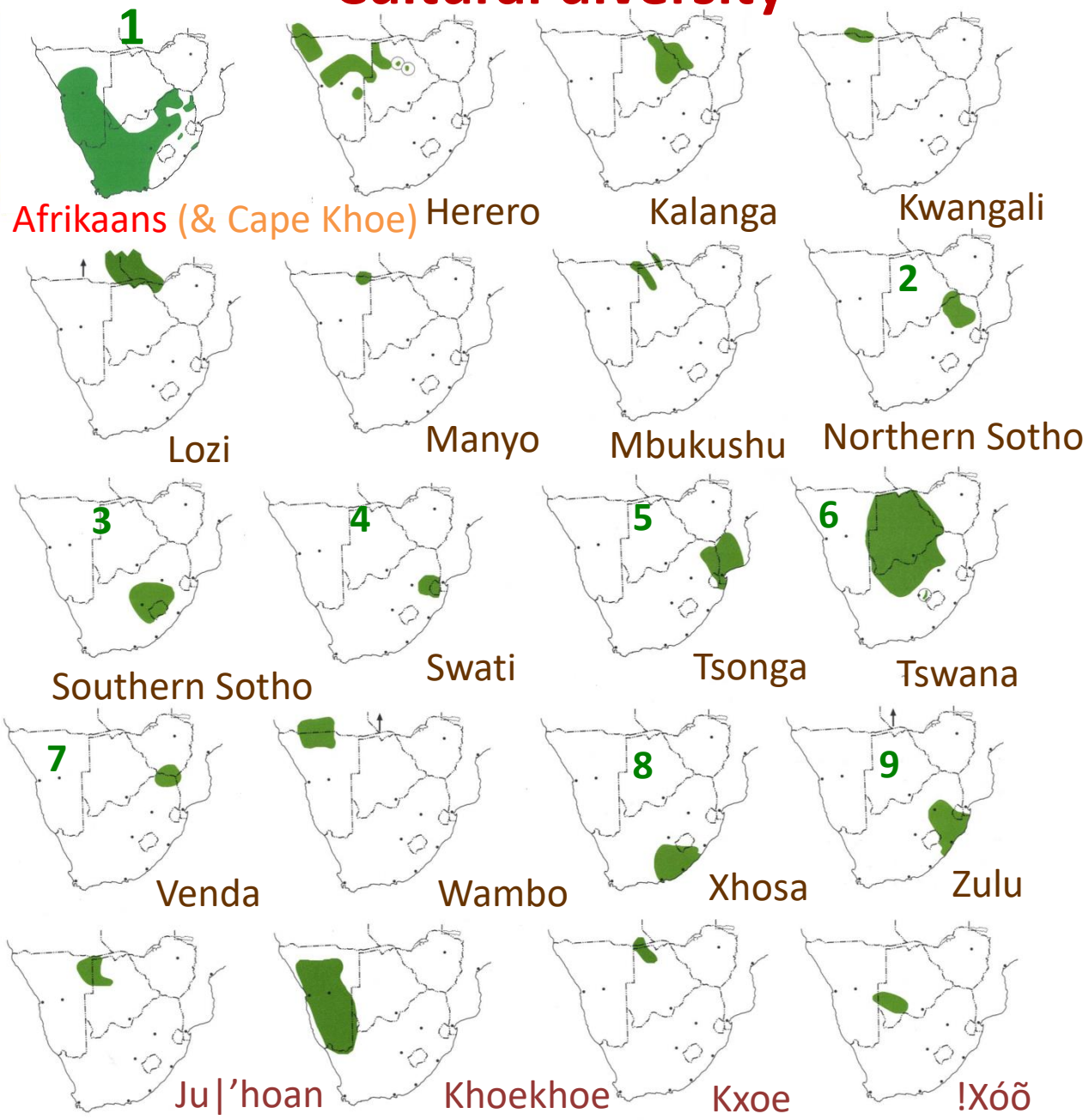
***San* or *Son* (*Pteronia onobromoides*)**

Cultural diversity

Indo-European languages

Bantu languages

San and Khoe languages



Language maps from A.E. Van Wyk *et al.* (2011) Briza Publications

The Indigenous Plant Use Forum – Promoting ethnobotanical research and the transformation of science in South Africa

Indigenous Plant Use Forum
21st Annual Conference
Oudtshoorn, 1-4 July 2018

27 annual conferences since 1996

25th conference (Skukuza, Kruger National Park) 3–7 Sept 2023
28th conference (Karridene Beach, KwaZulu-Natal) 16–20 Aug 2026

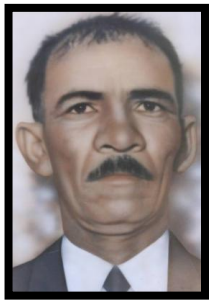
Conferences are held in rural areas to allow community participation

ipuf@uj.ac.za

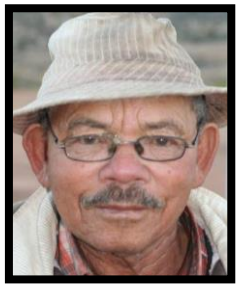
IPUF Best Young Scientist Award

2025 IPUF award to Tony Cunningham and the late Edward Mabogo

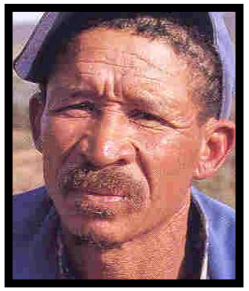
1. Afrikaans culture



Willem (Bêrend) Engelbrecht



Gert (Joelk) Dirkse



Willem Steenkamp

Janneke Nortje

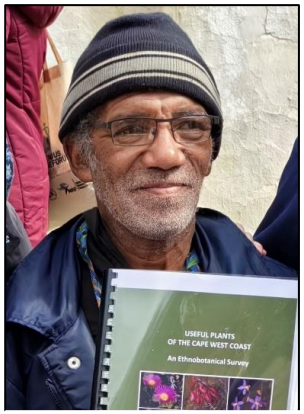
Margaret Hulley

Helene De Wet

Josef De Beer

Jan Baadjies

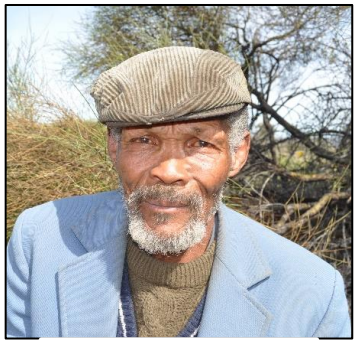
Jakop Tromp



Bertie Jacoman

Ashton Welcome

Lisa Philander



Koos Paulse

Jan (Dubbeljan) Joseph

Anna (Boom) Stewe

Quantitative, rigorous ethnobotanical studies in the Cape region, using the Matrix Method

2. Northern Sotho (Pedi) culture

Silas Senua Simenya

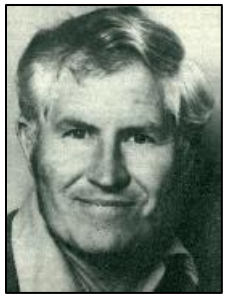
Martin Potgieter

Mahlatse Mogale

3. Southern Sotho culture

Annah Moteetee

Lerato Seleteng-Kose



Rodney Moffett

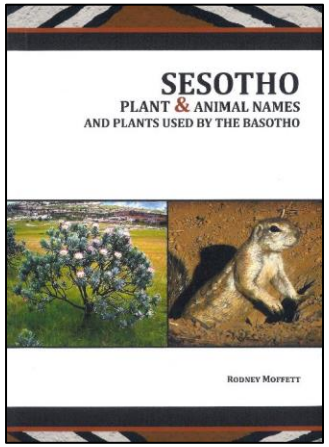
4. Swati culture

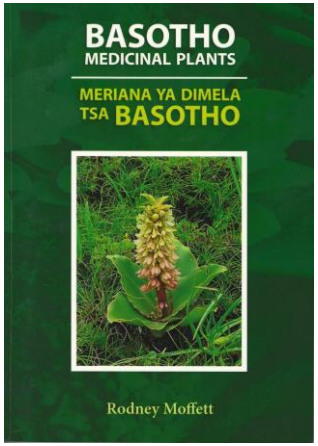
Themba P. Shabangu

Ben Dlamini, 1981. *Swaziland flora: their local names and uses.*

5. Tsonga culture

Eunezia Sitoe





6. Tswana culture

Oladapo Aremu

John Asong

Hedberg, I., Staugard, F. 1989. *Traditional medicinal plants: traditional medicine in Botswana.*

7. Venda culture

Edward Mabogo

Peter Tshisikhawe

Khathutselo Magwede

8. Xhosa & Pondo cultures

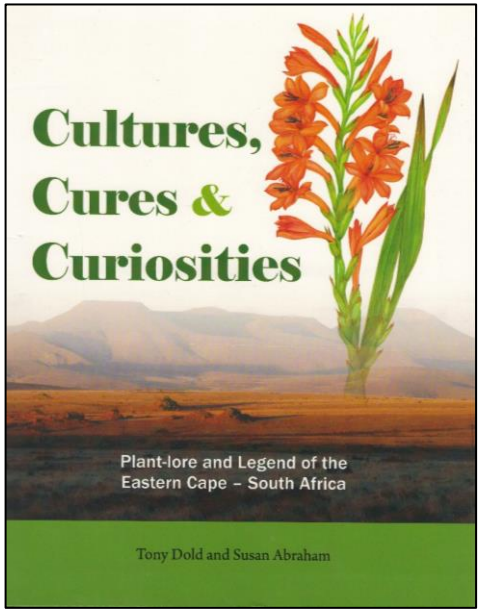
Charlie Shackleton

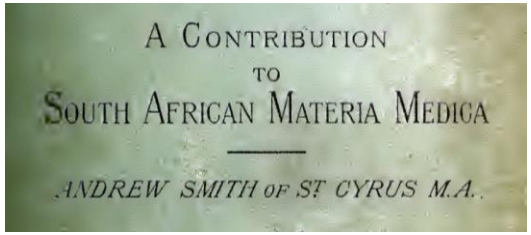
Sheona Shackleton

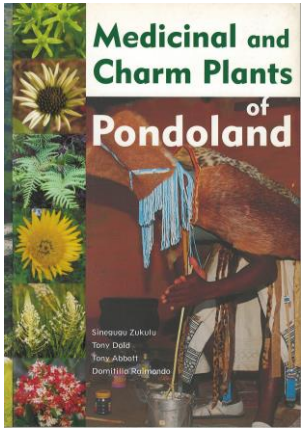
Sizwe Cawe

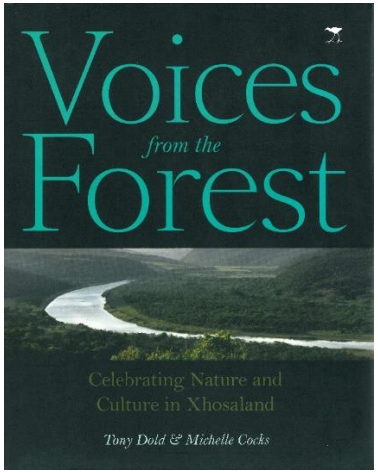
Michelle Cocks

Tony Dold









9. Zulu culture

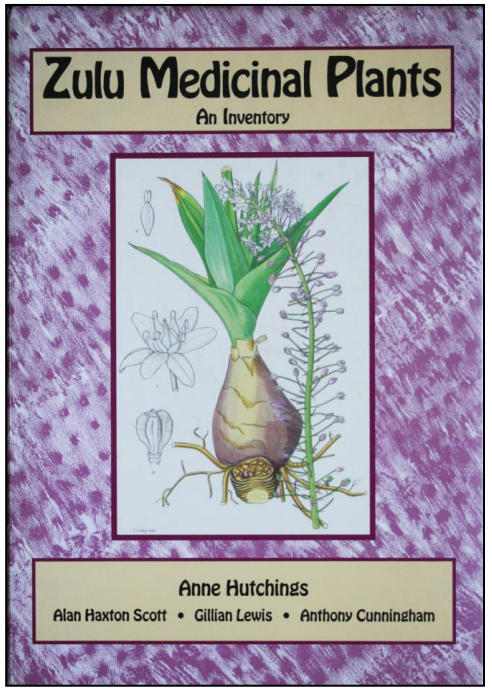
Lloyd Mhlongo

Helene De Wet

Nontuthuko Ntuli

Sibonelo Mbanjwa

Tony Cunningham

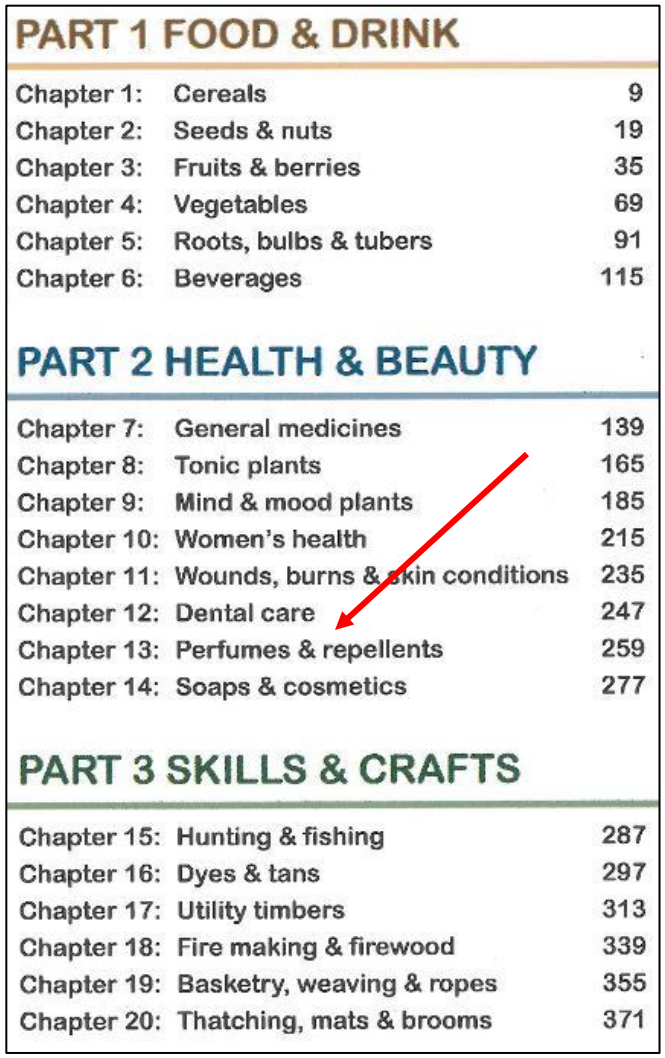


Ann Hutchings

Importance of books and publications

The only comprehensive ethnobotanical handbook for southern Africa

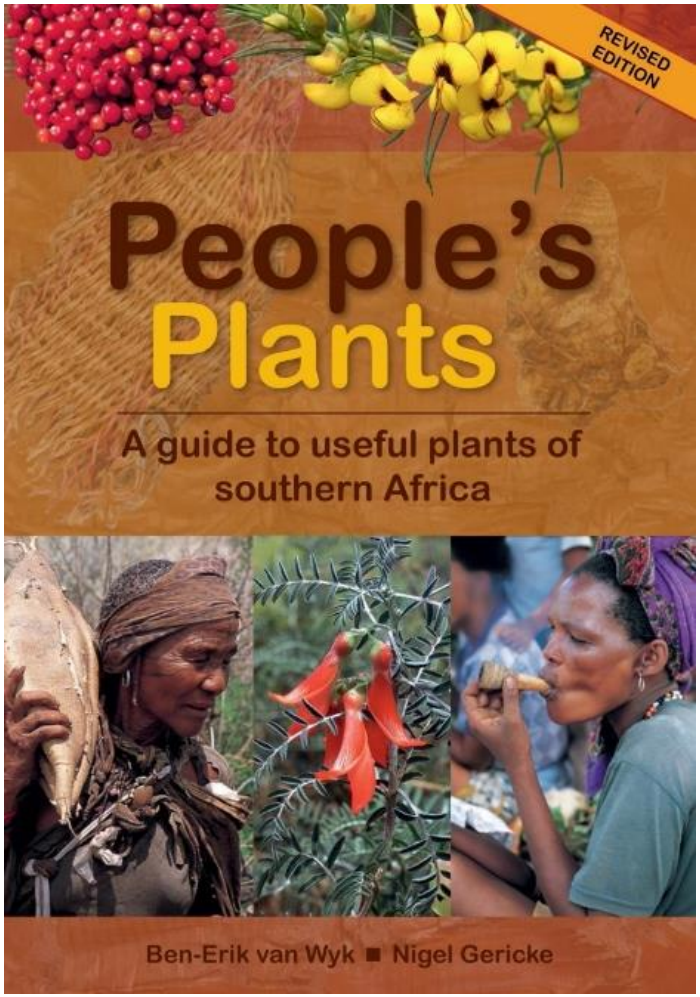
30 categories of use; 700 species; 900 photographs



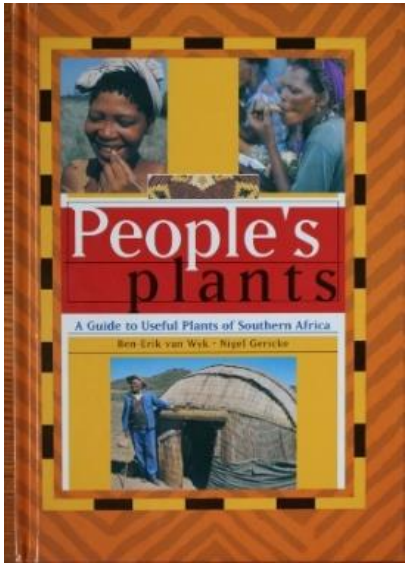
PART 1 FOOD & DRINK

PART 2 HEALTH & BEAUTY

PART 3 SKILLS & CRAFTS



Second enlarged edition - 2018



First edition - 2000

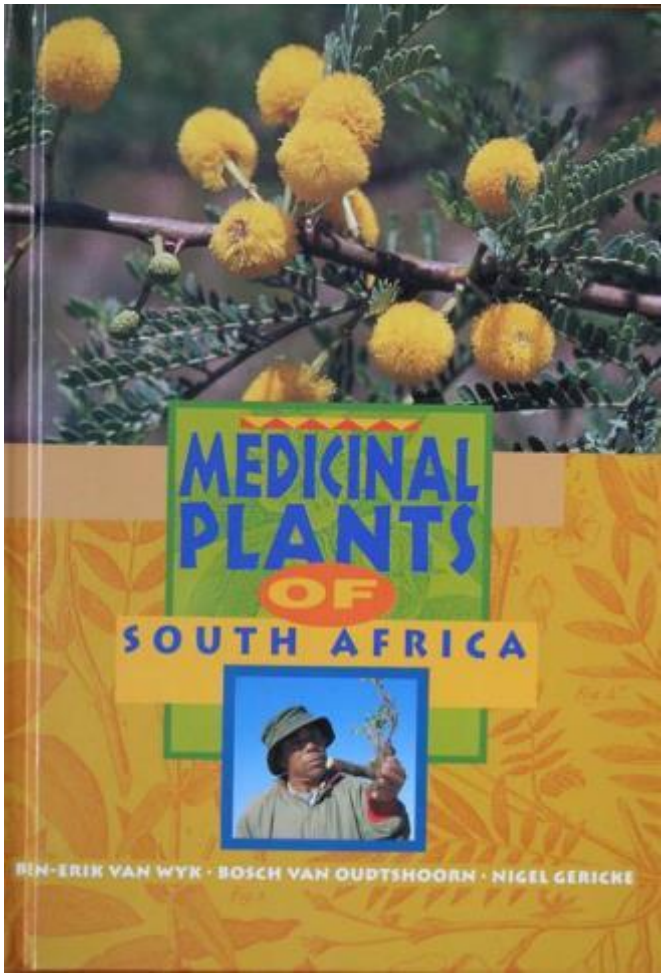
Demystifying the Medicinal Plants of South Africa

Identifying the most relevant species **Impact: 2400+ citations**

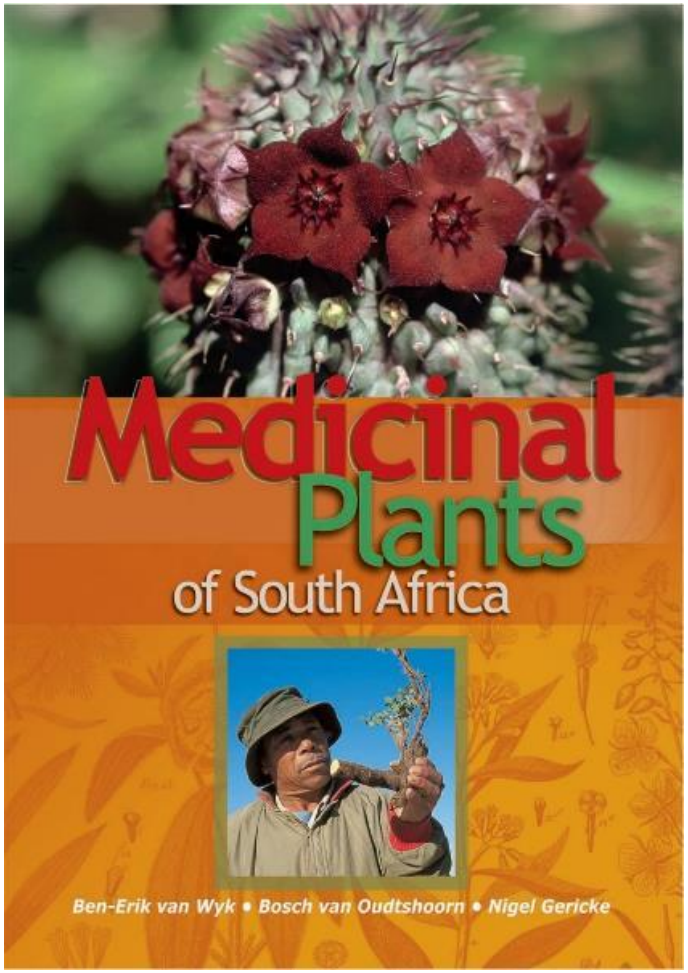
Van Wyk, Van Oudtshoorn & Gericke - Monographs of the top 150 species

Bosch van Oudtshoorn

Nigel Gericke



First edition - 1997



Second edition - 2009

Southern Africa is a focal point for new medicinal products

Journal of Ethnopharmacology 119 (2008) 342–355

Contents lists available at ScienceDirect

Journal of Ethnopharmacology

journal homepage: www.elsevier.com/locate/jethpharm

Review

A broad review of commercially important southern African medicinal plants

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Department of Botany and Plant Biotechnology, University of Johannesburg, P.O. Box 524, Auckland Park 2006, South Africa

ARTICLE INFO

Article history:
Received 8 May 2008
Received in revised form 14 May 2008
Accepted 16 May 2008
Available online 3 June 2008

Keywords:
Biosystematics
Chemical variation
Commercial development
Medicinal plants
Southern Africa
Taxonomy

ABSTRACT

Aims of the study: Commercially important indigenous medicinal plants of southern Africa are reviewed in the context of fundamental knowledge about their ethnobotany, phylogeny, genetics, taxonomy, biochemistry, chemical variation, reproductive biology and horticulture. The aim is to explore the rapidly increasing number of scientific publications and to investigate the need for further research.
Materials and methods: The Scopus (Elsevier) reference system was used to investigate trends in the number of scientific publications and patents in 38 medicinal plant species. Fifteen species of special commercial interest were chosen for more detailed reviews: *Agathosma betulina, Aloe ferox, Artemisia afra, Aspalathus linearis, Cyclopia genistoides, Harpagophytum procumbens, Hoodia gordonii, Hypoxis hemerocallidea, Lippia javanica, Mesembryanthemum tortuosum, Pelargonium sidoides, Siphonochilus aethiopicus, Sutherlandia frutescens, Warburgia salutaris* and *Xysmalobium undulatum*.
Results: In recent years there has been an upsurge in research and development of new medicinal products and new medicinal crops, as is shown by a rapid increase in the number of scientific publications and patents. Despite the fact that an estimated 10% of the plant species of the world is found in southern Africa, only a few have been fully commercialized and basic scientific information is often not available.
Conclusions: The limited available information indicates that some of the plants display remarkable regional variation in morphological, genetic and chemical characters that should be more thoroughly investigated. Basic biological information is needed to guide the rapidly accelerating commercialization process, especially the selection of superior clones, the development of new cultivars and the standardization of raw materials.

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Contents

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doi:10.1016/j.jep.2008.05.029

Fig. 1. Southern African medicinal plants of current interest in product and crop development. 1st row (from left to right): *Agathosma betulina, Aloe ferox, Artemisia afra, Aspalathus linearis*; 2nd row: *Cyclopia genistoides, C. maculata, Harpagophytum procumbens, Hoodia gordonii*; 3rd row: *Hypoxis hemerocallidea, Lippia javanica, Mesembryanthemum tortuosum, Pelargonium sidoides*; 4th row: *Siphonochilus aethiopicus, Sutherlandia frutescens, Warburgia salutaris* and *Xysmalobium undulatum*. Photographer: B.-E. van Wyk.

otany, basic biology and especially their biosystematics, including taxonomic, genetic and chemical variation.

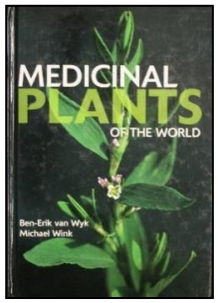
3.1. *Agathosma betulina* (P.J. Bergius) Pillans (Rutaceae)-round leaf buchu

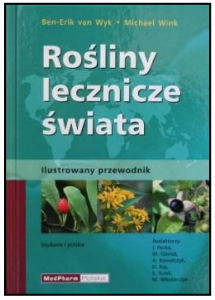
Buchu is an important plant in the Khoi-San tradition (Van Wyk and Gericke, 2000) and still enjoys a great reputation as a general health tonic, diuretic and mild urinary antiseptic. The essential oil is a valuable flavour product (similar to *cassis*) and is probably responsible for the antispasmodic, antiseptic and diuretic activities (Wichtl and Bisset, 2000; Lis-Balchin et al., 2001). Isomenthone and diosphenol are the major volatile compounds (Kaiser et al., 1975; Posthumus et al., 1996).

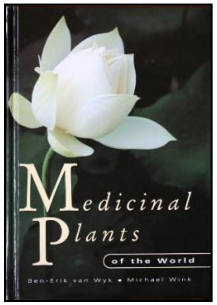
Buchu is a resprouting shrub endemic to the Cape. Revisions by Pillans (1950) and Spreeth (1976) clarified the taxonomy of *Agath-*

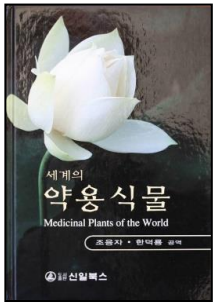
Incorporating South African species into the global literature

Creating a starting point/track record for future regulatory decisions

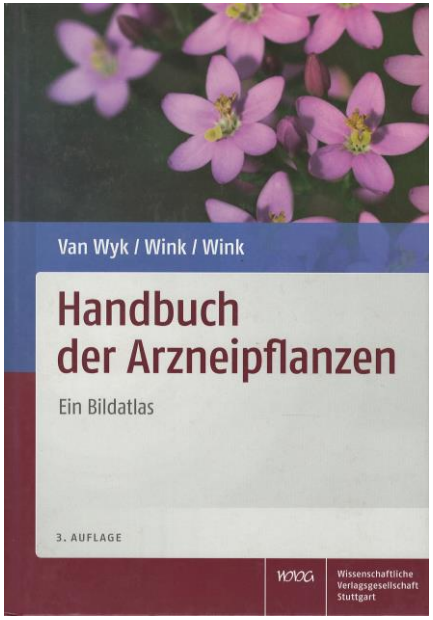




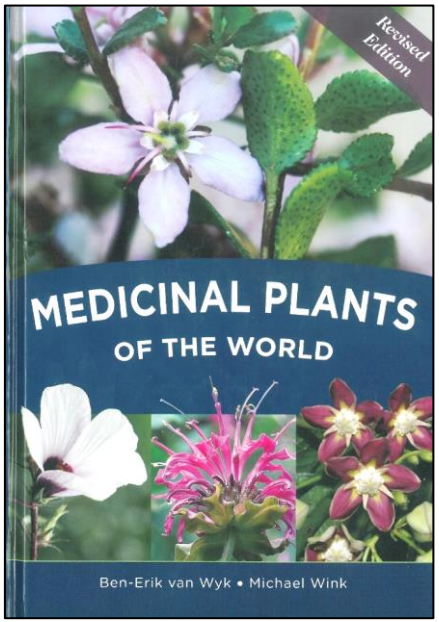




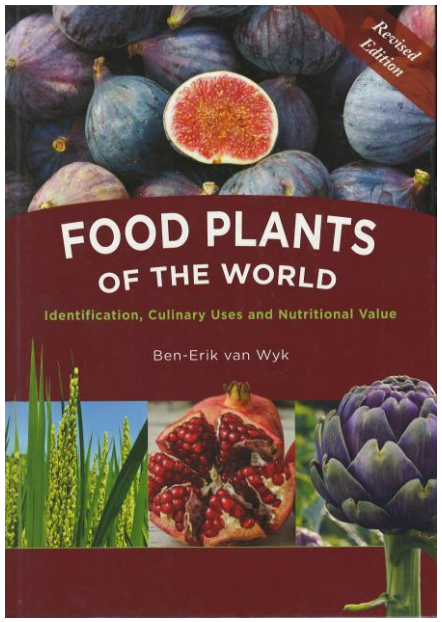
1st edition 2004



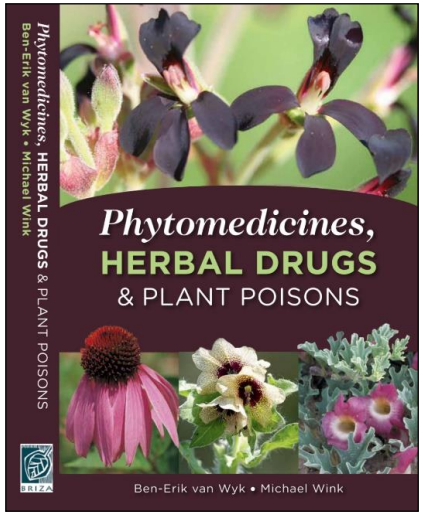
3rd German edn 2015

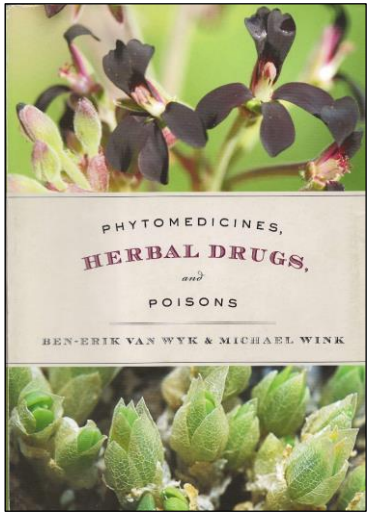


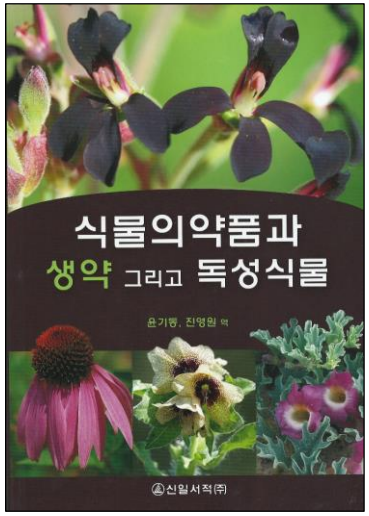
2nd English ed 2017

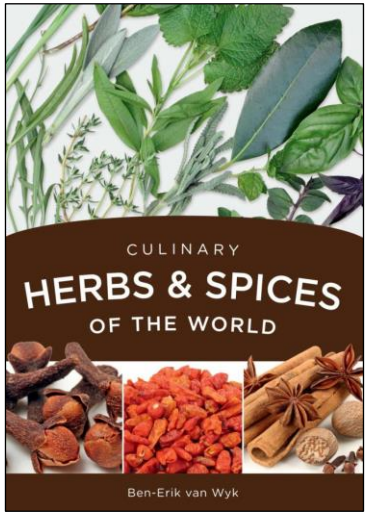


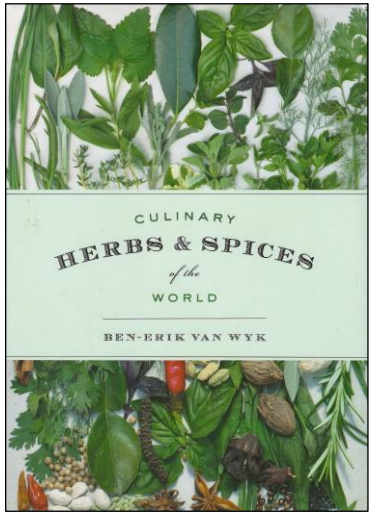
2nd English ed 2019











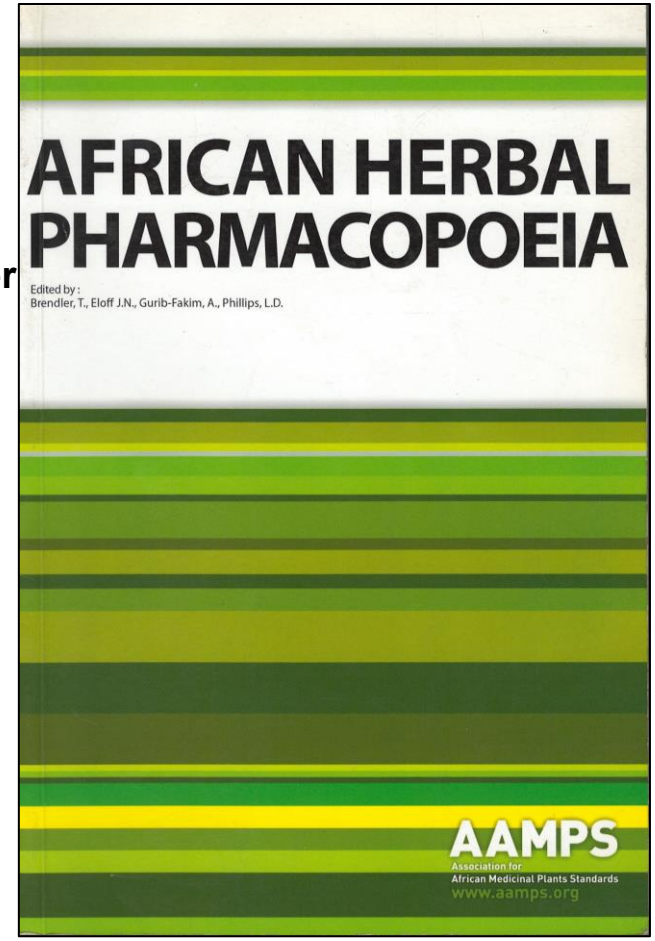
African Herbal Pharmacopoeia with South African species

Creating a starting point/track record for future regulatory decisions

Thomas Brendler

Kobus Eloff

Ameenah Gurib-Fakim

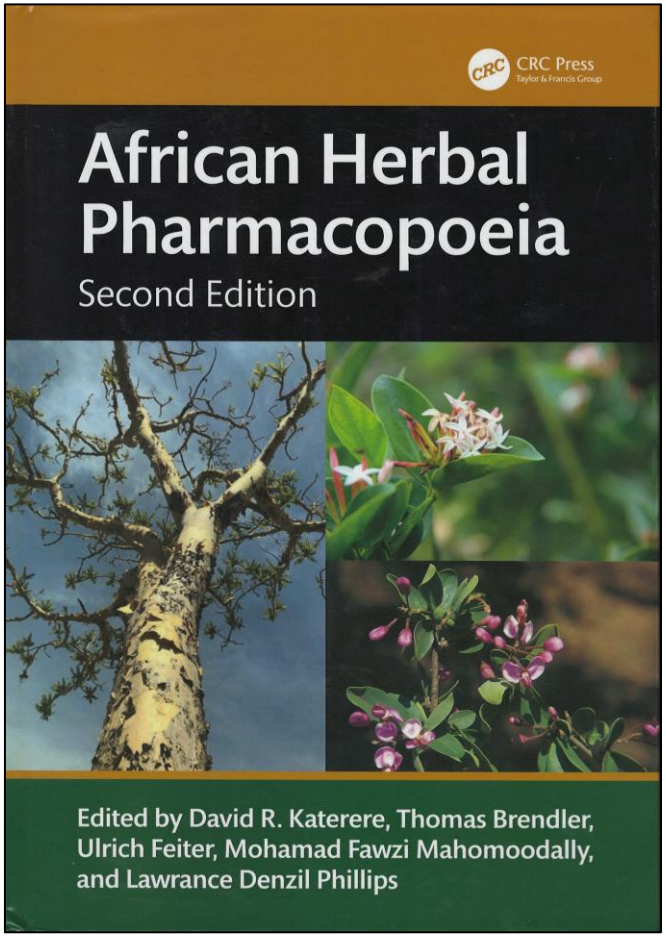


First edition - 2010

Denzil Phillips

David Katerere

Ulrich Feiter



Second edition - 2026

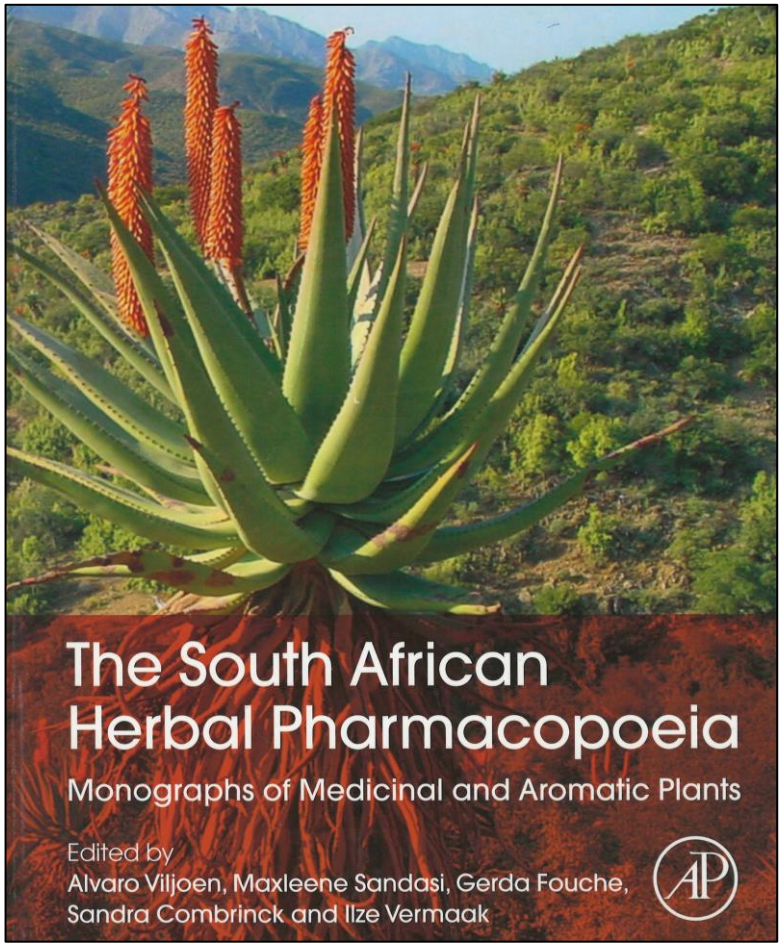
South African Herbal Pharmacopoeia

Phytochemical profiling

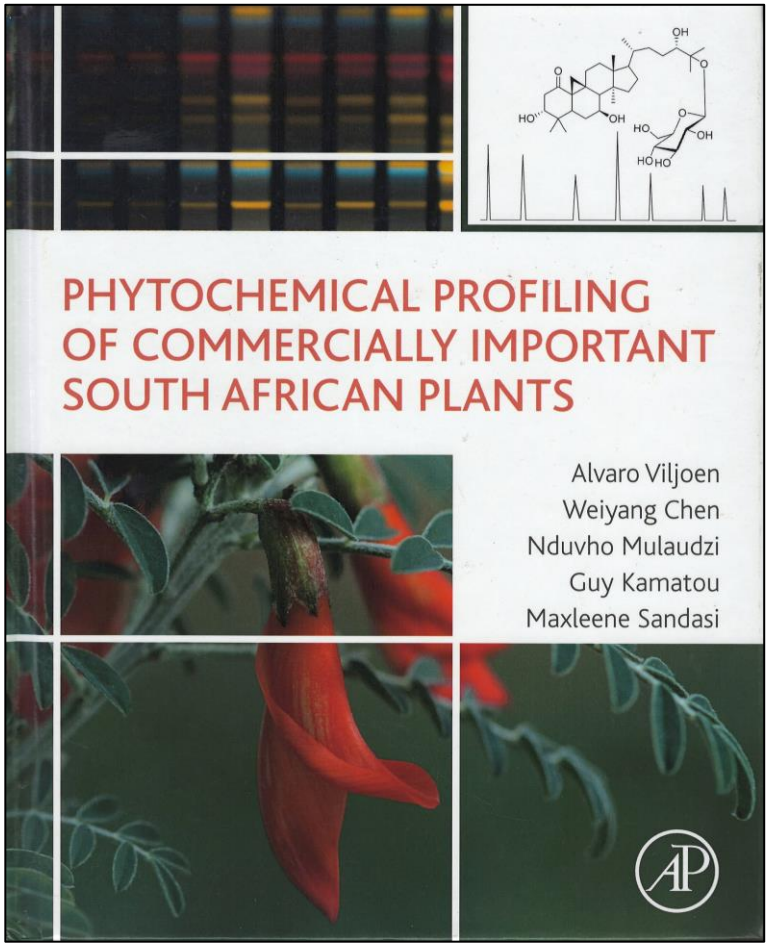
Summarising 30 years of medicinal plant science

Contributing to a future regulatory framework and quality control

Alvaro Viljoen



First edition - 2023



First edition - 2022

Five Phases of Product Development in Sout Africa

• **Informal Phase (Pre-1960s):** Long history of local cultures and indigenous healers using indigenous species such as buchu, aloe, honeybush, kanna/kougoed, rooibos.

•**Historical (Colonial Phase):** Introduction of branded European medicines from Halle in Germany (still going strong as Lennon's "Dutch Medicines").

•**Scientific Bioprospecting (1960s–1980s):** Researchers from the Council for Scientific and Industrial Research (CSIR) and local universities partnered with pharmaceutical companies to screen indigenous species for active organic compounds (e.g. the Noristan project, "African Potato" project). **Essential oil project**

•**Pioneering Commercialization Era (Mid-1970s–2007):** Research and development to produce branded, over-the-counter plant medicines and other products [e.g. S.A.Druggists (Healer's Choice); Phyto Nova brand – first branding of tablets - Sceletium, Siphonochilus, Sutherlandia, Warburgia, and Sutherlandia gel). Also placebo products (e.g. Spirolina, Moducare, Aloe drinks, etc.)

•**Regulated Bioprospecting (2008-Onward):** The implementation of the National Environmental Management: Biodiversity Act (NEMBA) and adherence to global Access and Benefit-Sharing (ABS) protocols; rapid expansion of the new crop species and new products listed above.

Scientific Bioprospecting (1960s–1980s)

The CSIR project (1963–)

A bioprospecting project: The most famous plant developed - *Hoodia gordonii* (*ghaap*) – proposed as an appetite-suppressant

Essential oil project: Aimed at developing the essential oil industry in South Africa

(12) **United States Patent**
Van Heerden et al.

(54) **PHARMACEUTICAL COMPOSITIONS HAVING APPETITE SUPPRESSANT ACTIVITY**

(75) Inventors: **Fanie Retief Van Heerden**, Fairland; **Robert Vleggaar**, Pretoria; **Roelof Marthinus Horak**, Pretoria; **Robin Alec Learmonth**, Pretoria; **Vinesh Maharaj**, Pretoria; **Rory Desmond Whittal**, Pretoria, all of (ZA)

(73) Assignee: **CSIR**, Pretoria (ZA)

EP
WO
WO
WO
WO

E. Borowski et al., "Chemical Studies 2–Methylheptadecanedioic Acid Fr Amphotericin B", *Tetrahedron Letters* 1965.

Pioneering Commercialization Era (1970s–2007)

The Hypoxis project (1970's)

Hypoxis hemerocallidea **tested against lung cancer.**

First controlled clinical study of a herbal remedy in South Africa

Name "African potato" created for commercial use

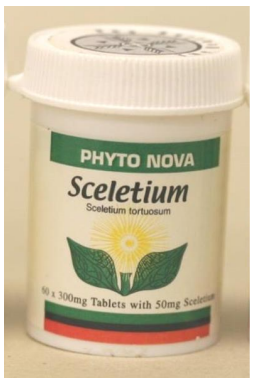
Product for prostate hypertrophy: Harzol
Product for immune support: Moducare

Commercial success based on clever marketing – not supported by scientific proof of concept

The South African Druggist project (1992-1996)

Healer's Choice **product range developed by *SA Druggists***

The Phyto Nova project (1999–2004) pioneering new crop and new product development



Four new commercial crops and five new species developed into products for the first time (commercially ca. 2000)

Directors of Phyto Nova in 2003

A new crop: Credo Mutwa in a field of *Sutherlandia*

Aloe Council of South Africa (Pty) Ltd

Non-Profit Company (NPC) [section 21 (non-profit) company] aimed at developing the *Aloe* industry in South Africa

Improved coordination

Helped to reverse CITES

Created a first SABS standard for a botanical herbal product

(Company was deregistered in 2026)

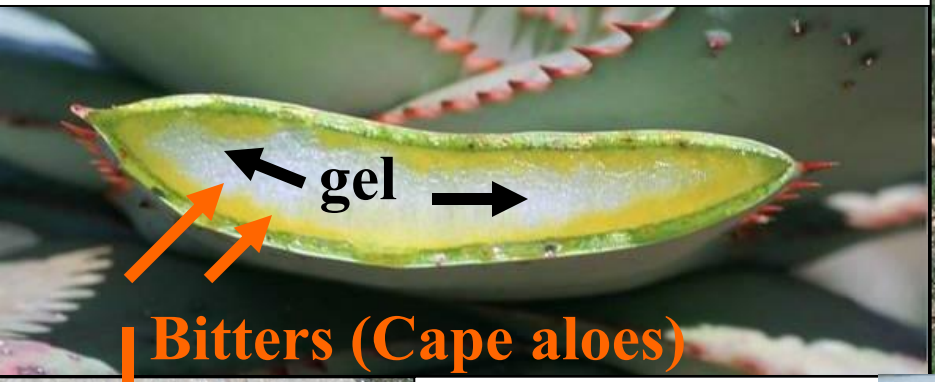
Dan Neser

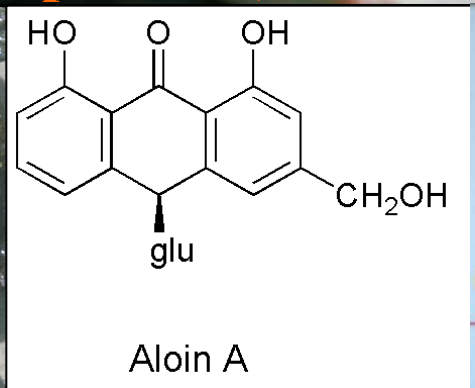
Aloe ferox (Asphodelaceae)

CAPE ALOE

Tonics and cosmetics – the inner, non-bitter fleshy part of leaf (gel)

The laxative bitter fraction is known as Cape Aloes





Aloin A

Product and crop development

Aloe Council of South Africa

National Standard for Aloe Raw Materials (Standards SA, 2007)

Many new products!

↑ First commercial plantation

← Sustainably “tapped” since 1761

Artemisia afra (Asteraceae)

UMHLONYANE (Zulu)
wildeals, *als* (Afrikaans)
wild wormwood

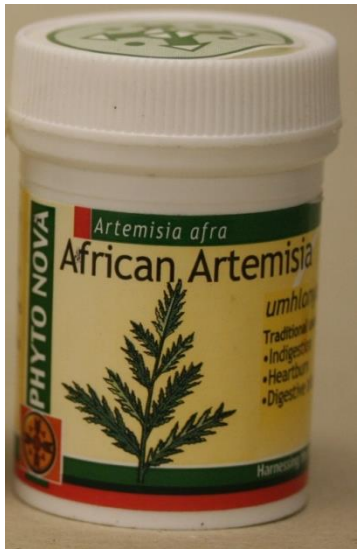
Numerous uses: mainly respiratory and stomach ailments

Essential oil is considered to be a useful substitute for armois oil.

Product and crop development

SA Druggist "Healer's Choice" 1996

First branded product



Phyto Nova 2003

First commercial plantation – ca. 1995

Hoodia gordonii
(Apocynaceae-Asclepiadoideae)

Small pieces of stems are eaten all day to suppress hunger and thirst

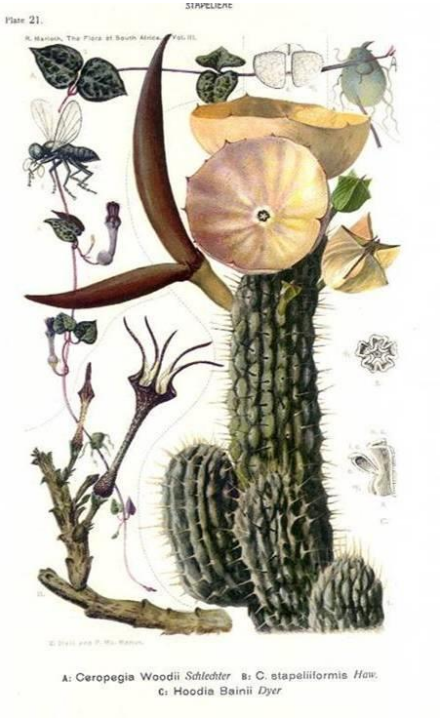
Wild-harvesting not sustainable

Intellectual property issues

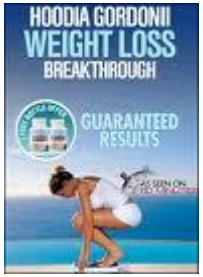
Large-scale developments (CSIR, Pfizer, Unilever) discontinued

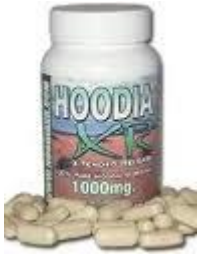
Failed attempt at commercialization

Unsafe for obese people; wrong dosage form (hoodia is a masticatory)



A: Ceropegia Woodii *Schlechter* B: C. stapeliiformis *Haw.* C: Hoodia Bainii *Dyer*





(12) **United States Patent**
Van Heerden et al.

(10) **Patent No.:**
(45) **Date of Patent:**

(54) **PHARMACEUTICAL COMPOSITIONS HAVING APPETITE SUPPRESSANT ACTIVITY**

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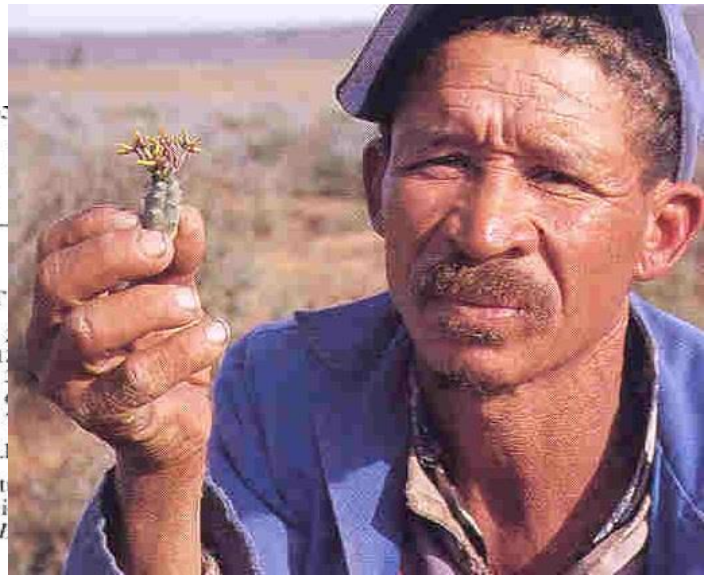
(73) Assignee: **CSIR**, Pretoria (ZA)

FOREIGN PATENT

EP	0 101 383 A1
WO	WO 97/47316
WO	WO 98/10068
WO	WO 98/27113
WO	WO 98/28335

OTHER PUBL

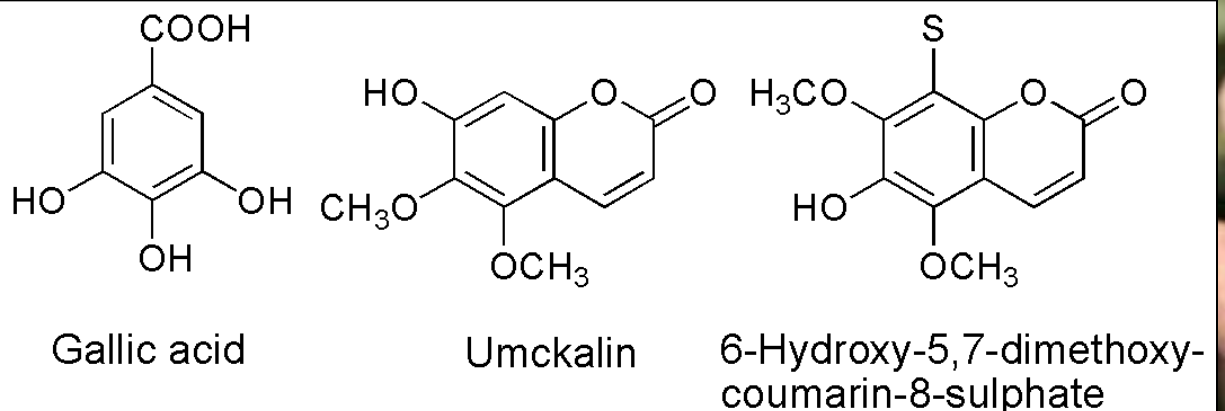
E. Borowski et al., "Chemical St
2–Methylheptadecanedioic Aci
Amphotericin B", *Tetrahedron*
1965.



Pelargonium sidoides
(Geraniaceae)

ROOIRABAS

Used in a German phytomedicine ("Umckaloabo") to treat bronchitis (80 million Euros annual turnover)

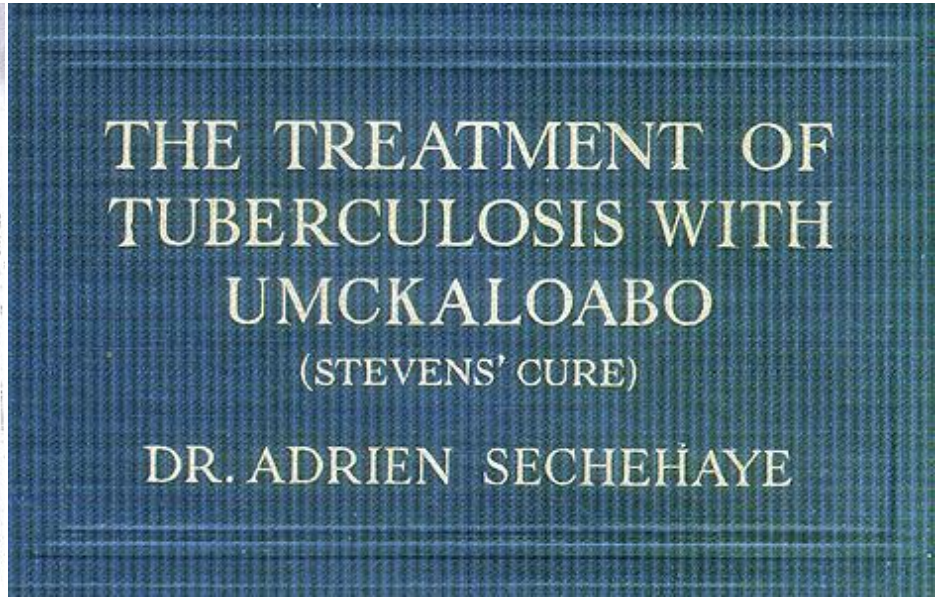


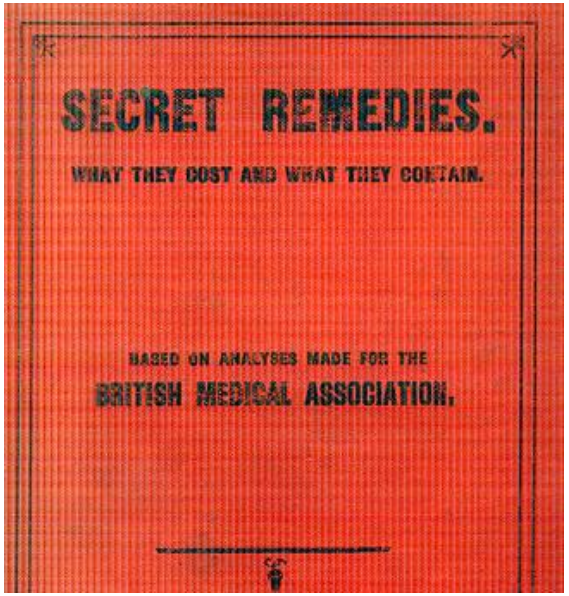
Gallic acid

Umckalin

6-Hydroxy-5,7-dimethoxy-coumarin-8-sulphate

Product and crop development (since early 20th century)





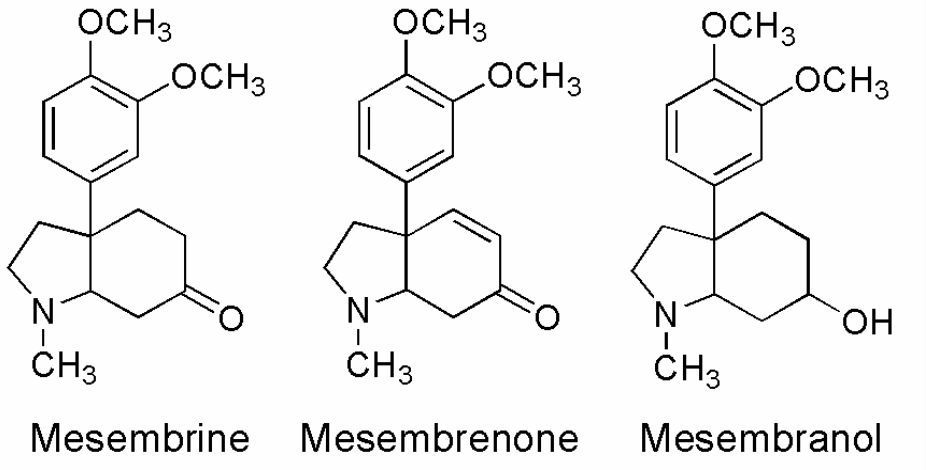
Ulrich Feiter – industry pioneer

Mesembryanthemum tortuosum)

(Mesembryanthemaceae)

SCELETIUM, *KOUGOED*

***Sceletium* elevates mood and decreases anxiety and stress**



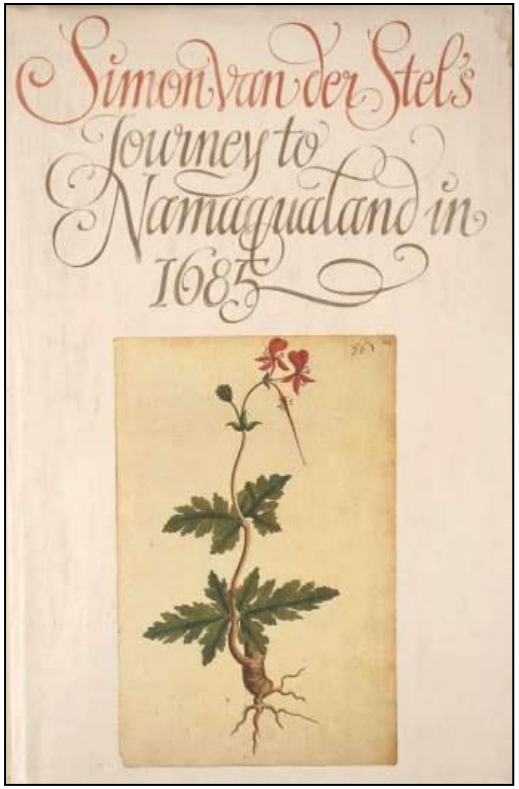
Indigenous knowledge and Intellectual property rights: interesting case study (rare case of explicit ownership)

Mesembryanthemum tortuosum
canna, kanna, kougoed


Simon van der Stel

Simon van der Stel's Journal of 1685, pages 783 en 784

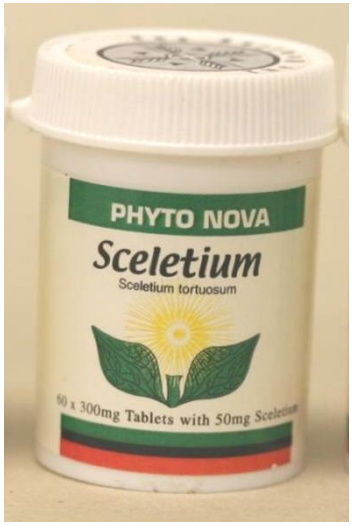
"This plant is found with the Namaquaas and then only on some of their mountains. It is gathered in October and is called *Canna.* It is held by them and surrounding tribes in as great esteem as the betel or areca with the Indians. They chew its stem as well as the roots, mostly all day, and become intoxicated by it, so that on account of this effect and its fragrance and hearty taste one can judge and expect some profit from its cultivation. Found on 20th October."



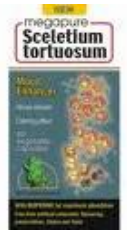
Product and crop development

Traditional Bushman (/Xam) and Nama / Khoi masticatory (*kougoed*)

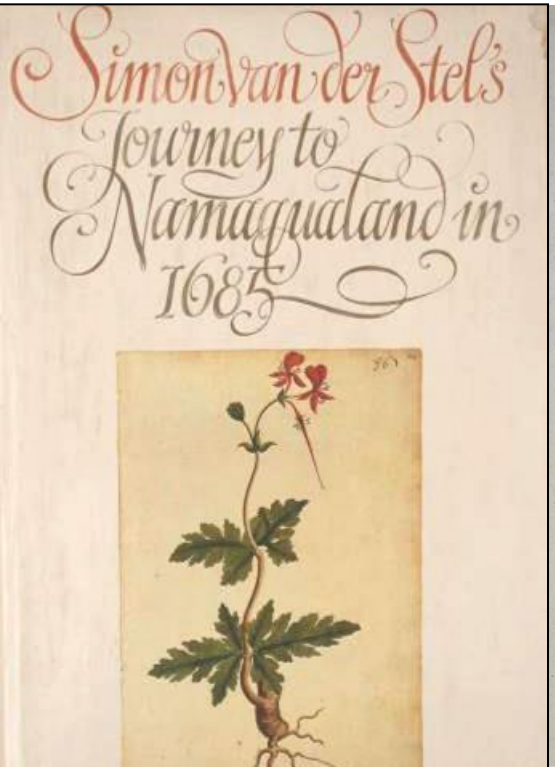
Recorded by Simon van der Stel in 1685



First branded product (2002)



Crop development – first experimental cultivation at Gouda (ca. 1996)



Sceletium cultivation for standardized extract - Zembrin®

Sceletium / Kanna: a success story

Hundreds of products globally – rapidly expanding global Kanna/ Sceletium market, estimated to be worth nearly **five billion rand** (**$300 million, R 4 866 000 000)**

Regional Product Registrations

•**United States: 54 dietary supplement products** containing kanna on the market [US National Institutes of Health's Dietary Supplement Label Database].

•**Canada:** Dozens of active, legally approved products containing *Sceletium* specifically authorized for adult cognitive support [Licensed Natural Health Products Database]

•**Europe:** Major retail chains (such as DM and Rossmann in Germany) stock *Sceletium* extract products on mainstream shelves [The EU's Traditional Herbal Registration pathway opened up]

Branded Extracts: Global industry is mainly based on heavily researched, standardized extracts:

Zembrin® - standardised extract developed by **HG&H Pharmaceuticals** in South Africa and distributed internationally. **Trimesemine™**. emerging clinical extracts.

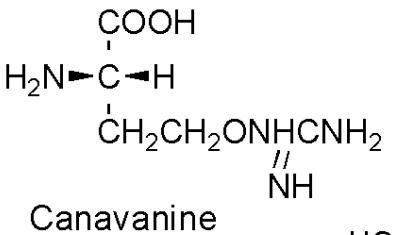
Product Formats: Powders, capsules, now also herbal tea, liquid drops/tinctures, botanical vapes, and wellness beverages. Many artisanal and niche products, mainly by online marketing, directly from Southern African farms to international consumers.

Producers now operate under the **Southern African Botanical Products Association** (SABPA) to streamline agricultural practices and ensure **fair trade compliance.**

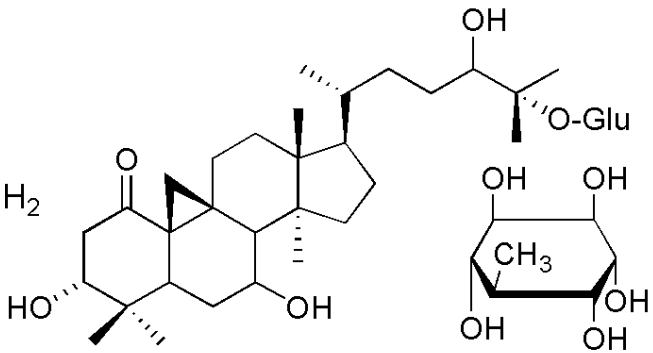
Lessertia frutescens
(Fabaceae)

SUTHERLANDIA, CANCER BUSH

Tonic “almost any disease” (fever, poor appetite, unspecified wasting diseases, indigestion, gastritis, etc.)



Canavanine



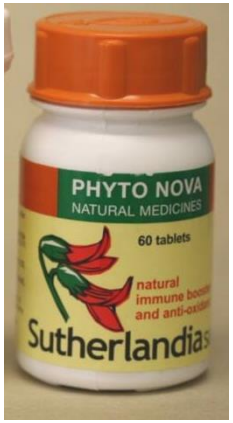
SU1 (=Sutherlandioside B)

Pinitol

Product and crop development

First comprehensive safety study on an indigenous herb in South Africa

Phyto Nova brand is still actively marketed

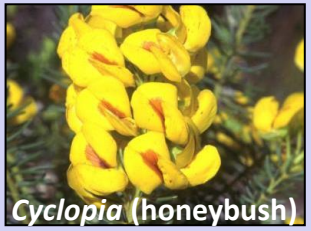


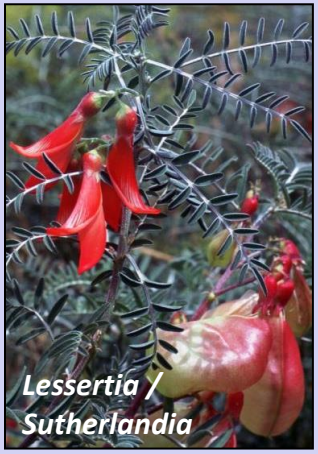

One of the first commercial plantations of *Sutherlandia* (North-West Province) - 2003

Prototypes and first branded commercial products

New momentum! Tremendous potential for the future!

Commercialized San and Khoi plants


Cyclopia (honeybush)


Lessertia / *Sutherlandia*


umckaloabo


Aloe ferox


hoodia


kanna / sceletium


rooibos tea


Artemisia (wilde-als)


round-leaf buchu


devils' claw


khat

San and Khoi plants with potential


Diosma
new perfume


Pteronia
new medicine


renosterbos
natural deodorant
new spice
"Karoo frankincense"


Pegolettia
new medicine


Rafnia
new
functional
food


tsama melon – cosmetic oil


Lebeckia ambigua – new pasture crop


sour fig – new food
(one of 1740 spp.)

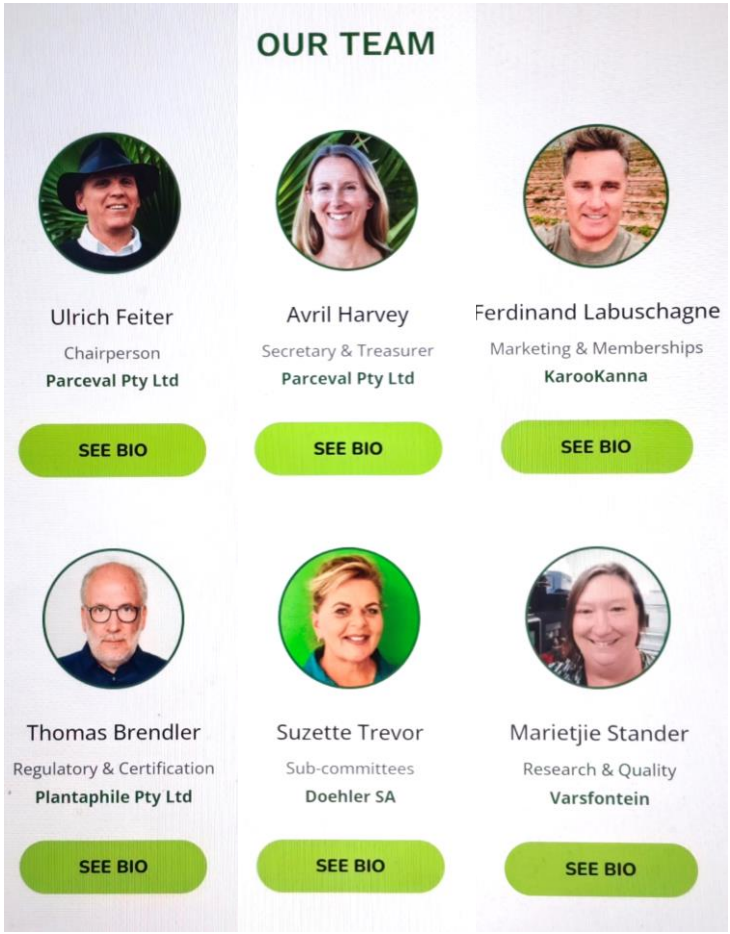
The SAEOPA project – the start of a new era

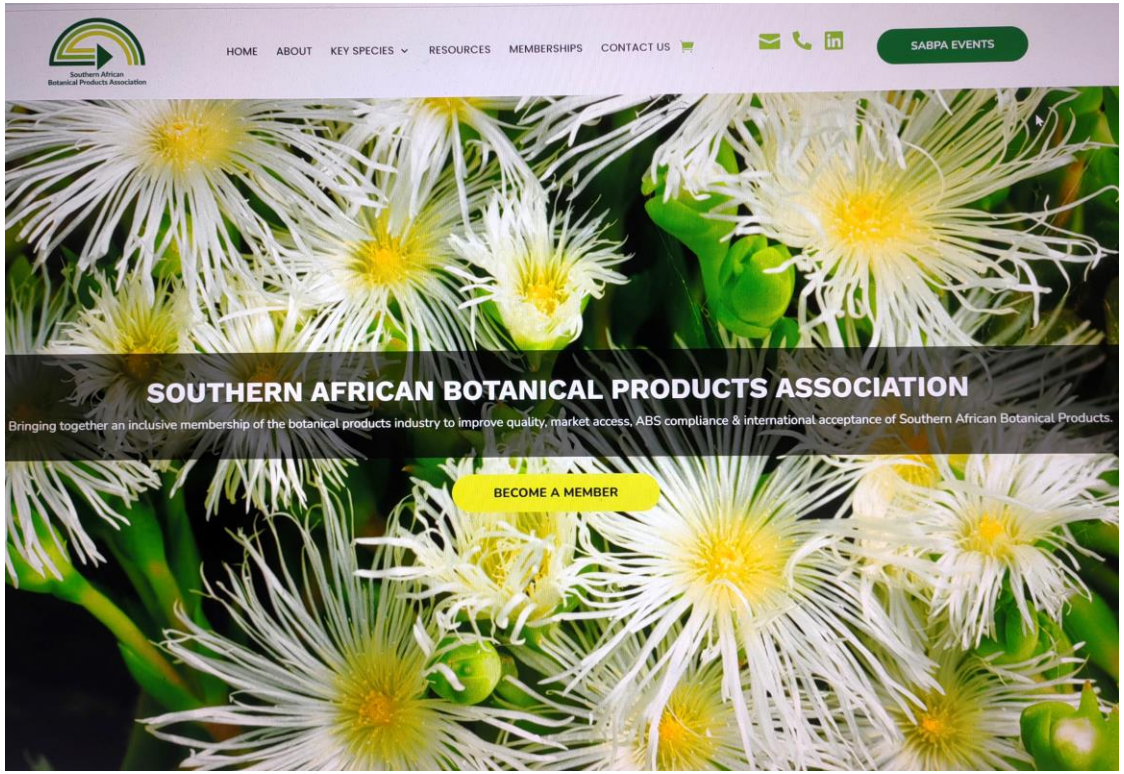
Congratulations to Karen Swanepoel and her associates and funders!

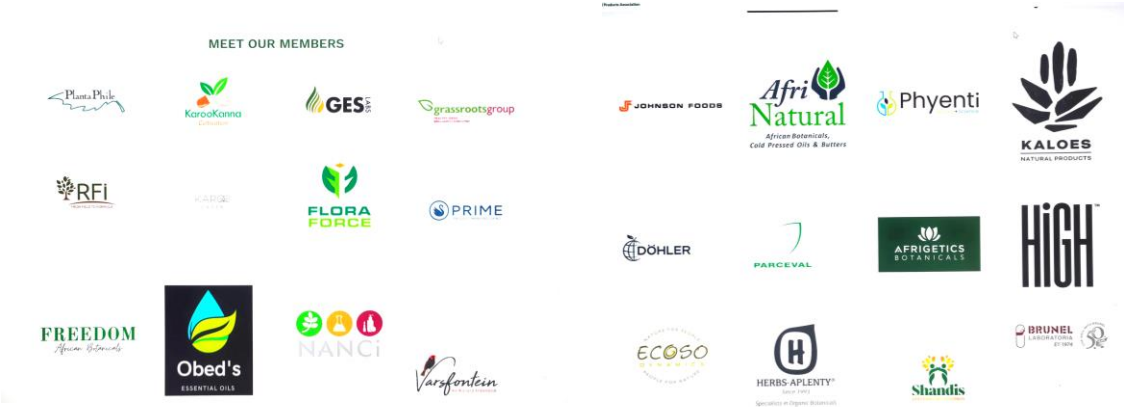
The Southern African Botanical Products Association

Southern African Botanical Products Association

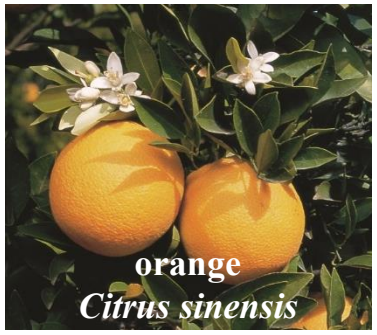
Best of luck to Ulrich Feiter and his team!

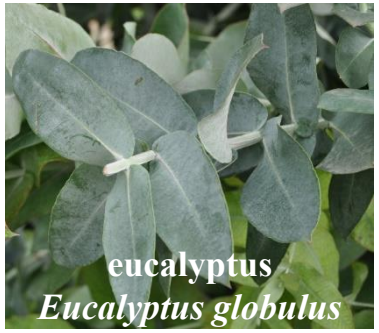






Most important essential oils by trade volume (top 16)





Conclusions

Botanical and cultural diversity are important strategic advantages that can be further developed and refined for the benefit of future generations

The tide has turned – South Africa has entered a new phase of success in new product development and commercialization

Commercial success requires traditional wisdom and scientific data to inform and guide the intricate steps that are necessary for marketing success:

- Accurate information on the taxonomy and identification of target species
- Population-level morphological, chemical and genetic diversity data
- Relevant ethnobotanical wisdom and legal intellectual property agreements
- Scientific and clinical proof of safety and efficacy (and quality)
- A sustainable source of material (preferably cultivated superior genotypes)
- A market-driven approach, rather than a product-driven approach