Challenges and opportunities in the globalization of African Traditional Medicines – a South African perspective

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Botanical diversity in Africa:

- Sub-Saharan Africa: ca 50 000 species
- Tropical Africa: 32 000 species
- Southern Africa: 22 000 species
South Africa – a country with exceptional biodiversity

60% of the flora is endemic to the region
60% of the black population visit traditional healers, their primary source of health care.
Continental diversity of commercialised medicinal plants

Mutti medicine: Herbs and murder

April 19, 2002 Posted: 1:49 PM EDT (1749 GMT)

JOHANNESBURG, South Africa -- African traditional herbal medicine -- muti -- is normally used to cure minor ailments, but other and more darker methods are associated with the treatments.

In recent years, South Africa has seen a string of occult crimes where people have been the victims of a ritual muti killing.

Former South African leader Nelson Mandela on Friday appealed for anyone with information to come forward to help British detectives identify a victim -- named Adam by the police -- who is suspected to be the victim of a ritualistic murder.

The boy's torso was found floating in London's River Thames. His arms, legs and head have never been recovered and police believe his body parts may used for traditional medicines.

There are no statistics for the number of muti murders in South Africa and estimates vary from one a month to 300 a year, according to Gerard Labuschagne, commander of the South African Police Service's investigative psychology unit.

Such killings are usually distinguished by the dismembered bodies of the victims. It is believed that body parts -- including internal organs -- are sometimes removed from victims still living, in the belief that their screams enhance the medicine's power.
Recorded number of rhino poached in South Africa

Number of rhino poached in South Africa

<table>
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<td>2014</td>
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(as at 30 June)

Market value per Kg:
- White rhino horn: up to £60,000
- Platinum: £33,973
- Gold: £26,865
Effectiveness of *Harpagophytum procumbens* in treatment of acute low back pain

Acute Effects of *Sceletium tortuosum* (Zembrin), a Dual 5-HT Reuptake and PDE4 Inhibitor, in the Human Amygdala and its Connection to the Hypothalamus

Effects of rooibos (*Aspalathus linearis*) on oxidative stress and biochemical parameters in adults at risk for cardiovascular disease
The Nobel Assembly at Karolinska Institutet has today decided to award the 2015 Nobel Prize in Physiology or Medicine with one half jointly to

William C. Campbell and Satoshi Ōmura

“for their discoveries concerning a novel therapy against infections caused by roundworm parasites”

and the other half to

Youyou Tu

“for her discoveries concerning a novel therapy against Malaria”

Nobelprize.org

The Official Web Site of the Nobel Prize

Nobel Prize in Medicine 2015

The Nobel Prize in Physiology or Medicine 2015 was awarded with one half jointly to William C. Campbell & Satoshi Omura & the other half to Youyou Tu.

Youyou Tu is the first China-based scientist to win a Nobel Prize.

An ancient Chinese herbal remedy led to the isolation of artemisinin.

Avermectins

Artemisinin

Ivermectin

An antimarial drug discovered by Tu in the 1970s. It was derived from the wormwood plant, after a search of herbal remedies to find antimarial drugs.
'Natural cures' to face safety scrutiny

KATHARINE CHILD | 21 November, 2013 00:53

File photo

Thousands of herbal medicines on the shelf that promise a cure from disease, or improved sexual performance, are finally going to be regulated.
Zuma call on SABS to speed up process on traditional medicines

Thursday 20 October 2011 16:51
SABC

President Jacob Zuma has called on the South African Bureau of Standards to accelerate efforts to standardise African traditional medicines.

The President has urged local manufacturers to take advantage of the services South African Bureau of Standards (SABS) offers. He was speaking at the opening of an SABS laboratory. It's a multi-million rand state of the art facility. It tests and certifies different products from medicines, clothing and footwear products among others. But traditional medicine, which is used by the majority of South Africans, remains untested.
South Africa’s Bioprospecting, Access and Benefit-Sharing Regulatory Framework

Guidelines for Providers, Users and Regulators

environmental affairs
Department: Environmental Affairs
REPUBLIC OF SOUTH AFRICA
Warburgia salutaris – Pepper bark
**Warburgia salutaris**

**Threats**

**Major Threat(s):**
There has been some habitat loss due to agricultural activities, expansion of human habitation and logging for firewood and timber. The major direct threat to the species is the exploitation of its bark, stems and roots for use in traditional medicinal practices as a treatment of head and chest ailments and also to cure people who are bewitched. This has led to the near extinction of the species in KwaZulu-Natal, parts of Mpumalanga, Swaziland and Zimbabwe.

**Conservation Actions**

Plants have been reintroduced into two protected areas in KwaZulu-Natal. Although there are subpopulations within protected areas, it is difficult to prevent exploitation. A number of projects are under way to provide a cultivated form.
Multivariate analysis of GCxGC essential oil data from wild and cultivated trees of *Warburgia salutaris*
Plant part substitution as a means of conservation?
Multivariate analysis of the LC-MS data of bark and leaf material
The three requirements for phytomedicines
Fake vs Real – the need for quality control

Brass should have smooth, rounded corners

There should be no burgundy border

Stitching should be uniform and clean
Hoodia gordonii

• Khoisan used *H. gordonii* on long hunting trips to suppress hunger and thirst.
• Research interest sparked by claimed appetite-suppressing properties.
• CSIR isolated and patented P57.

Hoodia Gordonii Plus Reduces Your Appetite in Minutes
Hoodia Weight Loss Breakthrough Guaranteed or your money back

Are you ready for SUMMER?

Pure Hoodia
100% pure with nothing added or taken away
THE MOST EXCITING DISCOVERY IN THE FIELD OF WEIGHT LOSS
Tackle the problem of weight loss head on. Pure Hoodia helps with a significant reduction in the average daily calorie intake PLUS a significant reduction in body fat content. Best of all, it's 100% natural and 100% pure! Lose weight like your favorite celebrities have...
- As recommended by Oprah
- The cast of Desperate Housewives

ORDER YOUR FREE TRIAL TODAY!

We believe our hoodia to be the finest available anywhere in the world. We receive our hoodia direct from the very farms where it grows in South Africa. It is 100% pure with nothing added or taken away.
We guarantee the quality of our product and give a money back guarantee should you not be satisfied.

Hoodia Stack
Free Trial!
The Revolutionary New Weight Loss Supplement That Will Help You...
- Lose weight
- Look great
- Eat less

Unique Hoodia
Lose 1lb-5lb's per week!
100% Pure Extracted Hoodia

1000 MG Sustained Release
Independently Tested
- Direct from South Africa

Try Hoodia diet patch FREE*
Click Here

*See site for details

As seen on 60 minutes
Guaranteed Results
2 FREE BOTTLE OFFER
Hoodia gordonii – large scale cultivation
Hoodia gordonii – variation in P57

Quantification for P57 in H. gordonii raw material samples

TIC of *Hoodia gordonii* raw material
Hoodia gordonii – examples of consumer products

Hoodia Slender Gel is a completely natural and organic water based gel containing pure Hoodia Gordonii and selected essential oils and extracts.

Hoodia has been used traditionally for thousands of years by the San Bushmen of Southern Africa as a natural appetite suppressant, whilst they were on long hunting trips.

Hoodia Slender Gel is unique in that it is absorbed through the skin into the body.

This is known as Transdermal application. Transdermal application is far more effective than conventional products like capsules, tablets and liquids, which are taken orally.

Orally taken products must first pass through the digestive system before being absorbed, and much of the active ingredients are lost in this process.

Hoodia Slender Gel bypasses the digestive system by going through the skin, and as such much less of the active ingredients are lost, making it much more powerful.

Hoodia Slender Gel actively supports the replanting of Hoodia Gordonii in the wild. For each box of Hoodia Slender Gel sold a donation is made to the Cereza National Conference in support of the Khoisan Religiet Development Trust whose aim is to help sustain the future growth and protection of this scarce and wonderful plant.

EETLESS Hoodia Capsules assists in reducing your appetite

Apple Patch Diet Hoodia Gum – #1 Appetite Suppressant Gum in USA

SPEARMINT Sugarless Gum

12 Pieces

Eat Candy, lose Weight!
Ask me how!
Track 1: *H. gordonii* raw material, track 2-7: *H. gordonii* products from different manufacturers and track 8: the reference standard P57

Desert diet drug hopes still a mirage
Fake products decimate public demand

Hoodia gordonii – quality control issues

Hoodia-related dietary pills banned in Santa Cruz, other California counties

By Stephen Baxter - Santa Cruz County
Posted: 01/09/2012 07:26:20 PM PST
Updated: 01/09/2012 07:27:33 PM PST

SANTA CRUZ - The maker of two dietary supplements that claimed to contain the appetite suppressant Hoodia can no longer sell the pills in Santa Cruz County, according to a settlement reached Monday between the company and county prosecutors.

The weight-loss and appetite suppressant drugs, Dex-L10 and Dex-L10 Complete, claimed to contain Hoodia Gordonii and were sold at Santa Cruz supermarkets, prosecutor Kelly Walker said.

Prosecutors tested the drugs and found that they contained no Hoodia, which derived from a succulent plant native to Southern Africa. The plant is scarce, and its popularity swelled in the mid-2000s for its use in pills, capsules and gel caps.

Santa Cruz County prosecutors filed an injunction against the Florida-based maker of the two products, GeoPharma Inc., as well as Breakthrough Engineered Nutrition, Mihir Taneja and Carol Dore-Falcone, Walker said. Prosecutors joined the suit from the counties of Santa Clara, Napa, Alameda, Marin, Monterey, Orange, Shasta, Solano and Sonoma.

GeoPharma - the parent company - had been traded on the New York Stock Exchange. It declared bankruptcy in March 2011, according to records.

“It was one of the largest makers of these products,” Walker said of GeoPharma.
Hoodia gordonii†

Cause of death: Lack of (realistic) quality control protocols before commercial development...activity?...safety?
Phytochemical distinction of *Pelargonium sidoides* and *P. reniforme* through NMR and UPLC-MS metabolomic profiling
Umckaloabo®

Schneller wieder gesund!

Pelargonium
Concentrated dried extract of Pelargonium sidoides

MediHerb UK

Umckaloabo®

50 ml

Wirkstoff: Auszug aus dem Wurzeln von Pelargonium sidoides zum Erwachsenen
Commercialisation of *Pelargonium sidoides*
Typical $^1$HNMR spectra of *P. sidoides* and *P. reniforme*

- No clear distinguishing features
- Chemometrics explores variation
- Allows bulk analysis of samples
$^1$HNMR cluster analysis

- PCA shows some degree of chemical variation
- OPLS demonstrates clear separation of the two species
UPLC-MS chromatograms of \emph{P. sidoides} and \emph{P. reniforme}

Marked region shows variation between the two species
UPLC-MS cluster analysis

- Chemical variation observed using both PCA and OPLS analysis
- Separation is consistent with $^1$HNMR data
OPLS-DA identifies UPLC-MS distinguishing markers

S-plot showing biomarkers

Average content of biomarkers

What the devil is in your phytomedicine? Exploring species substitution in *Harpagophytum* through chemometric modeling of $^1$H-NMR and UPLC-MS datasets
Introduction

- *Harpagophytum procumbens* (Burch.) DC. ex Meisn. subsp. *procumbens* (Pedaliaceae) has a long history of ethnobotanical use.
- Treat rheumatism and arthritis, for analgesia and digestive disorders and as a general tonic or applied topically as an ointment to treat sores, ulcers and boils.
- Common names: Devil’s Claw, grapple plant, duiwelsklou all referring to the fruit of the plant with its hook-like protrusions.

Devil’s Claw  
*Harpagophytum* spp.  

N = 347

Principal component analysis score plot

*H. procumbens* (blue) and *H. zeyheri* (red) LC-MS data

\[ R^2[1] = 0.178951 \quad R^2[2] = 0.115056 \]
September 9, 2015

Bishop Dr. Truman Berst
Alternative Remedies Health & Herbs
425 Ellsworth Street SW
Albany, Oregon 45202-1100

Re: Misbranding/Adulteration of Devil’s Claw Dietary Supplements

2 Certain overseas jurisdictions allow the Substitute Plant to be sold as part of the same product as Devil’s Claw. This approach has been criticized in the scientific literature due, in part, to the distinct chemical profiles of the two plants and the lack of evidence that the two are pharmacologically equivalent. See, e.g., Nontobeko P. Mncwangi, et al., What the devil is in your phytomedicine? Exploring species substitution in Harpagophytum through chemometric modeling of $^1H$-NMR and UHPLC-MS datasets, 106 Phytochemistry 104-115 (October 2014) (“[O]ur results clearly demonstrate a phytochemical disparity between the two species which may impact on their biological properties. . . . The chemometric analysis results showed that the two species are not chemically equivalent, particularly, that harpagoside is not always present in H. zeyheri, suggesting that the therapeutic outcome may be different, thus they should not be used interchangeably until pharmacological equivalence has been confirmed.”)
ATM - destigmatised

Academic & lay public

Wild crafted vs Cultivation

Biological regulations stifling

Capacity concerns Collaboration Alternative methods for QC

Research

Perceptions

Education

Sustainability

Legislation
Challenges and opportunities in the globalization of African Traditional Medicines – a South African perspective

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