

Advancing the South Africa's Biodiversity Innovation: From Bioprospecting to Advanced Product Development

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science, technology
& innovation

Department:
Science, Technology and Innovation
REPUBLIC OF SOUTH AFRICA



CSIR
Touching lives through innovation

80th
anniversary

The Bedrock of Research: The Indigenous Knowledge Systems (IKS) Research Programme



- Central to the CSIR's research approach
- Designed to promote, develop and protect indigenous knowledge systems
- Functions as a vital interface, actively working with communities, small-scale producers, and traditional healers
- It is a key implementation agent of South Africa's national IKS Policy, first adopted in 2004.

The background features a complex network of light gray circuit lines and molecular structures, including hexagonal rings, overlaid on a white background. On the left, a large, dark blue chevron shape points towards the center, containing a glowing blue circuit pattern. A solid teal diagonal line runs from the top right towards the center.

Key Strategies for CSIR IKS Research Programme

Research and Development



Transfer of TK from THC to CSIR & signing of PIC, MAT and BSA



Rhizomes



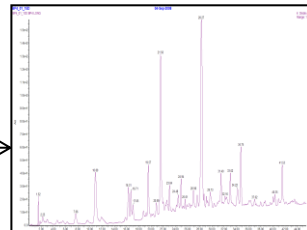
Processing of plants in Botanical Supply Unit



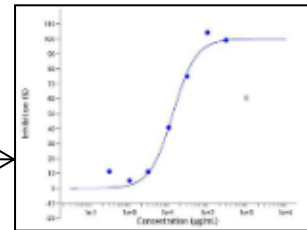
Cultivation



Product development



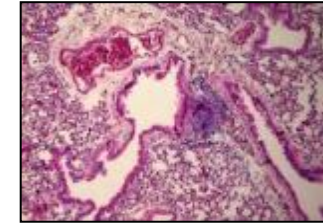
Chemical profiling + optimisation of herbal preparation



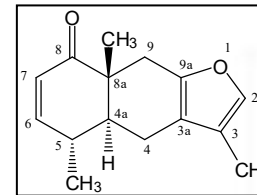
In vitro bioassaying – most potent activity at glucocorticoid receptors



IP protection

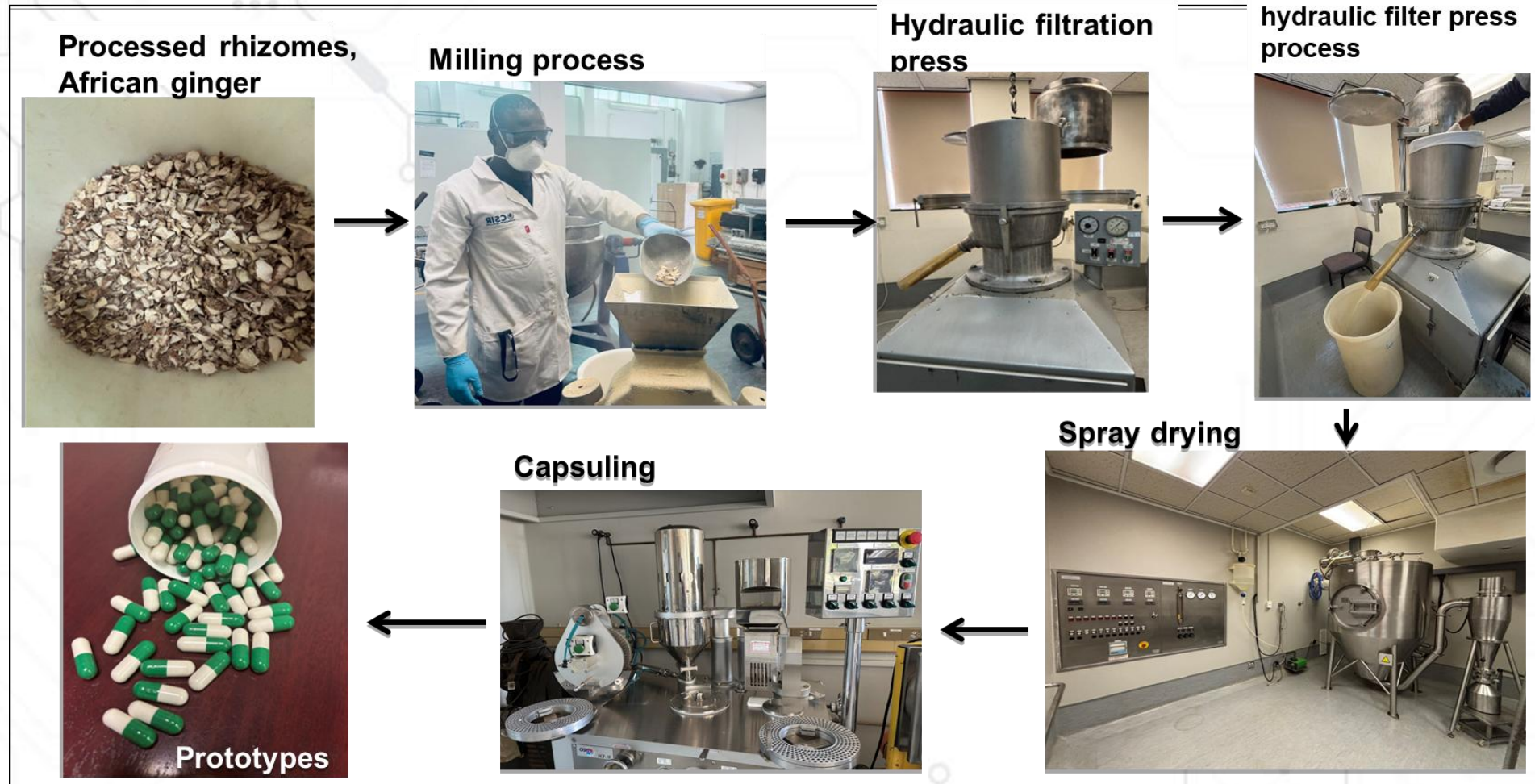


In vivo bioassaying – significant ↓ in lung inflammation (*viz.* IL8; cell infiltration; eosinophils + neutrophils in BAL), no toxicity



Bioassay guided fractionation – active ID

Technological Advancement in Agro-Processing



Commercialization and Strategic Partnerships



Quality products developed for Traditional Health Practitioners



Grassroots innovation: Aloe ferox and R. Geranium products in the market
The Aloe ferox-based project included training of farmers in the processing of Cape aloe



Supercritical CO₂ extraction equipment



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Landmark Innovations

Key selected scientific innovations derived from indigenous plants

Plant (Scientific/Common Name)	Indigenous Knowledge Holder (s) & Traditional Use	CSIR Scientific Innovation	Commercial Application / Product	Key Partners & Benefit-Sharing Status
<i>Lippia javanica</i> (Lemon Bush)	Traditional Healers: Insect repellent.	Identification and patenting of novel mosquito-repellent compound; commercial-scale extraction technique.	Mosquito-repellent candles and other products.	Traditional Healers' Committee. Benefit-sharing agreement in place and operational.
<i>Aloe ferox</i> (Cape Aloe)	Widespread traditional use: Laxative, skin healing.	Formulation of stable gels and cosmetic lotions.	Gels and cosmetic lotions.	Focus on developing harvesting and processing hubs.
<i>Sutherlandia frutescens</i> (Cancer Bush)	Widespread traditional use: Tonic, treats colds, flu, stress.	Development of standardized herbal teas.	Herbal teas for traditional medicine market.	Work with traditional healers and communities.
<i>Siphonochilus aethiopicus</i> (African Ginger)	Traditional Healers: Treats colds, flu, asthma, pain.	Development of standardized herbal teas; R&D on anti-inflammatory properties for asthma.	Herbal teas; potential future pharmaceuticals.	Traditional Healers' Committee. Benefit-sharing under discussion for future products.
<i>Sceletium tortuosum</i> (Kanna)	Khoi & San Peoples: Mood elevator, stress and anxiety relief.	Phytochemical isolation of compounds for anti-plasmodial activity testing.	Standardized extracts (e.g., Zembrin) for nutraceutical/wellness market.	Collaborations with universities.
<i>Sclerochiton ilicifolius</i> (Molomo Monate)	Seleka & Shongoane communities: Sweetener.	Investigation of monatin as a natural sweetener; patenting and licensing.	Licensed for development as a natural, non-caloric sweetener.	Cargill (licensee). Benefit-sharing agreements signed (2015) with communities.
<i>Elephantorrhiza elephantina</i> (Eland's Bean)	Widespread traditional use; prominent in NC	The CSIR has explored the potential of this plant in the cosmetics industry, particularly for its properties related to hair loss.	Used in development of hair loss solution	Working with commercial partner to upscale the technology

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Empowering Communities and Preserving Heritage

CSIR is a strong advocate for the principles of Access and Benefit-Sharing (ABS)



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**Driving Socio-Economic Growth and a
Sustainable Future**

The CSIR's innovative work with indigenous plants is a significant contributor to South Africa's bio-economy



Technology Transfer and
SMME Support



Supporting Sustainable
Resource Management



Mainstreaming
Traditional Medicines



Bioprospecting in the Biodiversity Economy: 25 Plant species



Hoodia gordonii
(Hoodia)



Agathosma betulina
(Buchu)



Aspalathus
(Rooibos)



Buchu crenulata
(Buchu)



Bulbine frutescens
(Burn Jelly)



Cyclopia intermedia
(Honeybush)



Lippia javanica



Lobostemon fruticosus
(Lobostemon)



Cyclopia genistoides
(Honeybush)



Eriosema kraussianum
(Bangalala)



Harpagophytum procumbens
(Devil's claw)



Helichrysum odoratissimum
(Golden everlasting)



Hypoxis hemerocallidea
(African potato)



Kigelia africana
(Sausage tree)



Pelargonium reniforme
(Kidney leaved pelargonium)



Trichilia emetic
(Mafura – oil)



Pelargonium sidoides
(Kalwerbossie)



Sceletium tortuosum
(Kanna)



Siphonochilus aethiopicus
(African ginger)



Sutherlandia frutescens (Cancer bush, balloon pea)



Warburgia salutaris
(Pepperbark tree)



Tylosema esculentum
(Marama bean - oil)



Ximenia americana (Sour plum – fruit and oil)



X. caffra (Sour plum – fruit and oil)



Xysmalobium undulatum (Uzara)

The background is a solid blue color with a subtle, light blue circuit board pattern. A large, white, stylized arrow points from the left side towards the right, with its tail on the left and its head pointing towards the right. The arrow is composed of several parallel lines, giving it a sense of depth and movement. The text "Thank you" is centered in the middle of the image, in a white, sans-serif font.

Thank you