THE ABS CAPACITY DEVELOPMENT INITIATIVE

L'INITIATIVE DE RENFORCEMENT DES CAPACITES POUR L'APA

1st Marula Sector Development Plan Workshop

Sustainable supply, use and conservation

Background and overall objectives

2nd July 2019

Cyril Lombard
ABioSA project advisor

funded by

Federal Ministry for Economic Cooperation and Development

ORGANISATION INTERNATIONALE DE la francophonie

INSTITUT DE LA FRANCOPHONIE POUR LE DÉVELOPPEMENT DURABLE IFDD

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Swiss Confederation

Federal Department of Economic Affairs, Education and Research EAER
State Secretariat for Economic Affairs SECO

implemented by

giz Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

Content

- Background, ABioSA project activities, issues
- Importance of sector development plans
- Key elements
- Objectives of workshop (expected outcomes)

USES AND POPULATION DYNAMICS OF *Sclerocarya birrea* HOCHST. subsp. *caffra* (SOND) KOKWARO IN MUTALE, LIMPOPO PROVINCE, SOUTH AFRICA

By

Mabala Mulalo Grace

(11582201)

University of Venda

ESTABLISHING VIABLE AND SUSTAINABLE RURAL ECONOMIC DEVELOPMENT PROGRAMMES IN A COMPETITIVE GLOBAL ECONOMY: ANALYSIS OF MARULA COMMERCIALISATION IN SOUTH AFRICA

by

VUYO MAHLATI

ABioSA project and the marula sector

Inception phase: value chain selection process – marula fruit products including oil, UNIDO GQSP project 2 clusters

Component 1.1 Market access: Cosmetics, Foods

Component 1.2 IPLCs: aTK issues, assert role in value chain

Component 1.3 Support to SMEs (including SMMEs, Coops), and BSOs, technical assistance and capacity building

Component 2 Financial assistance, grants, 2nd phase: Innovation, growth, new markets

Component 3 Policy dialogue, enabling environment

Market access 1.1

1.1 Market access

Food ingredients:

Product	EU Novel Foods	FDA GRAS	China New Food RM
Marula fruit juice/extract	Defining standardized and stable product, overcome Muhammad et al, 2014.	If OK for EU NF then should be OK for FDA, expert panel opinion required	If EU Novel Foods OK then "only" acute toxicity /pathogenicity test, 2 X genetic toxicity tests and 28 day oral toxicity test required
Marula oil	Should be achievable	If OK for EU NF then should be OK for FDA, expert panel opinion required	If EU Novel Foods OK then "only" acute toxicity /pathogenicity test, 2 X genetic toxicity tests and 28 day oral toxicity test required

Cosmetic ingredients:

Value chains / products	REACH EC 1907/2006	CLP EC 1272/2008	EU Cosmetics EC 1223/2009	China REACH	China 2015 IECIC	FDA GHS
Marula seed oil – refined and crude						

Some issues arising in support to marula SMEs

Multiple SMEs and Coops in marula value chains applied for technical assistance and financial assistance

Capacity of supply of marula large, but potentially exaggerated by producers (biological capacity, socio-economic supply issues, commercial realities)

Some scientific studies, differing methodologies

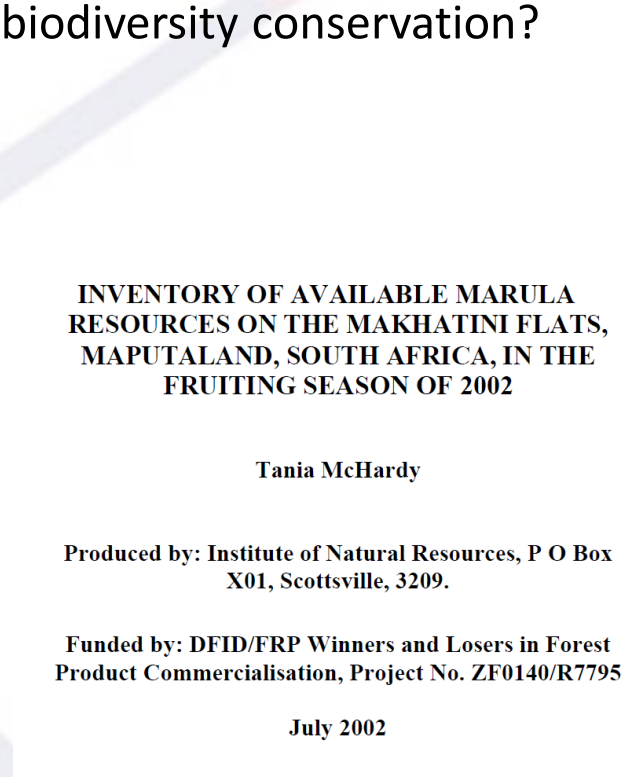
How will commercialisation affect biodiversity conservation?

Need for “plantations”?

Impact of plantations? Jobs?

Industry asks:
- **How much can you produce?**
- **Is it sustainable?**

Funders ask:
- **Does it create jobs?**
- **Does it conserve biodiversity?**



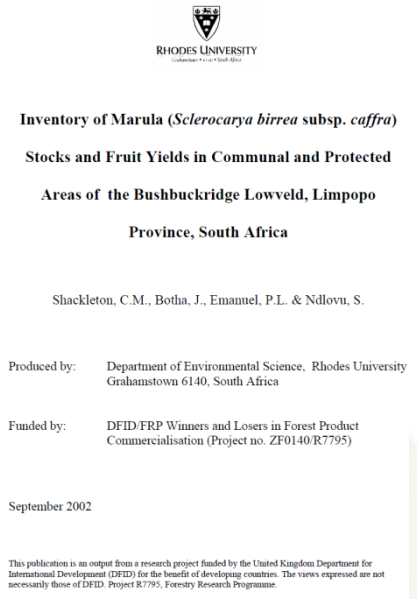
INVENTORY OF AVAILABLE MARULA RESOURCES ON THE MAKHATINI FLATS, MAPUTALAND, SOUTH AFRICA, IN THE FRUITING SEASON OF 2002

Tania McHardy

Produced by: Institute of Natural Resources, P O Box X01, Scottsville, 3209.

Funded by: DFID/FRP Winners and Losers in Forest Product Commercialisation, Project No. ZF0140/R7795

July 2002



RHODES UNIVERSITY

Inventory of Marula (*Sclerocarya birrea* subsp. *caffra*) Stocks and Fruit Yields in Communal and Protected Areas of the Bushbuckridge Lowveld, Limpopo Province, South Africa

Shackleton, C.M., Botha, J., Emanuel, P.L. & Ndlovu, S.

Produced by: Department of Environmental Science, Rhodes University Grahamstown 6140, South Africa

Funded by: DFID/FRP Winners and Losers in Forest Product Commercialisation (Project no. ZF0140/R7795)

September 2002

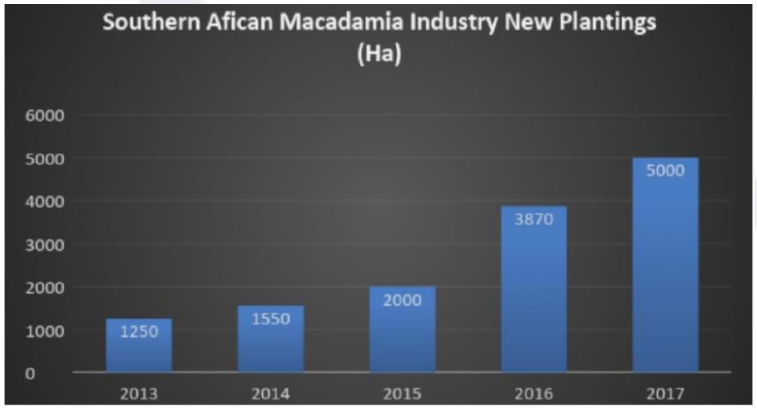
This publication is an output from a research project funded by the United Kingdom Department for International Development (DFID) for the benefit of developing countries. The views expressed are not necessarily those of DFID. Project R7795, Forestry Research Programme.

Importance of a Sector Development Plan

Role of board/council in success of Rooibos

SA Macadamia Growers' Association

SA Olive Oil Sector Development Plan, 2013



SAMAC

South African Macadamia Growers' Association

Country	Total Area (ha)	Projected new plantings (ha / year)	Projected production (Metric tonnes nut in shell)					
			2015	2016	2017	2018	2019	2020
South Africa	19 500	1 500	46 950	50 500	54 000	57 600	61 200	64 800
Australia	17 500	1 000	43 945	46 000	50 000	53 000	55 000	58 000
USA	8 160	-	16 500	16 500	16 500	16 500	16 500	16 500
Kenya	17 500	720	24 000	27 500	32 000	36 000	42 000	47 000
Malawi	6 058	270	6 559	7 573	6 967	7 803	7 178	8 040
Guatemala	10 000	1 000	8 867	9 050	9 225	9 400	9 575	9 800
Brazil	6 000	400	6 000	6 300	6 600	6 900	7 200	7 500
China	65 000	10 000	5 000	8 000	12 000	20 000	30 000	50 000
Vietnam	2 000	2 000	100	500	1 000	2 000	3 000	5 000
Mozambique	1 000	500	500	1 000	2 000	5 000	8 000	10 000
TOTAL	**152 718**	**17 390**	**158 421**	**172 923**	**190 292**	**214 203**	**239 653**	**276 640**

STRATEGY

2017 - 2022

Marula sector development plan, key elements

- Sustainable supply, sustainable biodiversity impacts, conservation, capacity of supply and role and impact of domestication and cultivation;
- Current and potential markets, industry and consumer trends;
- Traditional knowledge and Access and Benefit-sharing;
- Science, technology and product and manufacturing innovation;
- Quality, standards, certifications;
- Market access and non-tariff measures, compliance in local, regional and global markets;
- SME development along the value chain, including access to funding and finance; and
- Sector organisation, promotion and communication.

Objectives of the workshop

- Exchange ideas, gather data/information to reach a common understanding on the current status of the sustainability of supply of marula, and initiate the establishment of baseline information;
- Identification of additional key stakeholders relevant to marula sustainability plan, and to a marula sector development plan
- Exchange ideas on the methodologies of resource assessments with the view to future coherence in developing accurate assessments and plans;
- Discuss and propose ideas towards a regional marula sector development plan;
- Agree next steps

Marula Resource Survey

A report on the Sclerocarya birrea tree population and the availability of its fruits in Northcentral Namibia

Prepared by: Saskia den Adel
CRIAA SA-DC

For: the Indigenous Plants Task Team (IPTT)

July 2010

Thank you

A Vision 2030 for the Namibian Marula Industry

November 2012

Capacity Building for Biotrade Project

Report prepared by **PhytoTrade Africa** in collaboration with **CRIAA SA-DC**
Authors: Cyril Lombard, Pierre du Plessis and Michel Mallet

Marula traditional uses

Many uses across all ethnic groups where the resource occurs, truly a “transboundary” TK and IKS example

These include the fruit for food and beverages, and the kernel as a food and condiment, and the oils from the kernel as an emollient

Food Reviews International, 28:375–388, 2012

ISSN: 8755-9129 print / 1525-6103 online
DOI: 10.1080/87559129.2012.660716

Taylor & Francis
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Sclerocarya birrea (Marula), An African Tree of Nutritional and Medicinal Uses: A Review

ABDALBASIT ADAM MARIOD[1] AND SIDDIG IBRAHIM ABDELWAHAB[2]

[1]Department of Food Science and Technology, College of Agricultural Studies, Sudan University of Science and Technology, Khartoum North, Sudan
[2]Department of Pharmacy, Faculty of Medicine, University of Malaya, Kuala Lumpur, Malaysia

Sclerocarya birrea *(Anacardiaceae) is a popular African wild tree distributed in many African countries where the leaves, stem bark, root, and fruits are used in food and traditional medicine: the fruit is rich in ascorbic acid. The fruit juice contains sesquiterpene hydrocarbon, which are terpenes found in plants that are reported to have bacteriostatic properties. The fruit contains a hard brown seed. The seed encloses a soft white kernel rich in oil and protein. The oil contains oleic, palmitic, myristic, and stearic acids; the kernel protein contains amino acids, with a predominance of glutamic acid and arginine. The extracts from different parts showed high total phenolic compounds and radical-scavenging capacities and antioxidant activities.* Sclerocarya birrea *is widely studied with regard to its antidiabetic, anti-inflammatory, analgesic, antiparasitic, antimicrobial, and antihypertenisve activities.*

Keywords Antidiabetic, Anti-inflammatory, Antimicrobial, Antioxidant, Phenolic compounds, Protein, Oil, *Sclerocarya birrea*

Bark and roots include: “hypertension” and diabetes mellitus” as well as “anti-inflammatory conditions” (Ojewole, 2003) and “type 2 diabetes mellitus” (Ojewole, 2004)

Marula fruit chemistry and health

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[2]Department of Pharmacy, Faculty of Medicine, University of Malaya, Kuala Lumpur, Malaysia

ELSEVIER

Available online at www.sciencedirect.com
ScienceDirect
Food Chemistry 103 (2007) 82–87

Food Chemistry
www.elsevier.com/locate/foodchem

Phenolic composition of *Flacourtia indica*, *Opuntia megacantha* and *Sclerocarya birrea*

A.R. Ndhlala, A. Kasiyamhuru, C. Mupure, K. Chitindingu, M.A. Benhura, M. Muchuweti *

Department of Biochemistry, University of Zimbabwe, P.O. Box MP167, Mt. Pleasant, Harare, Zimbabwe

JOURNAL OF AGRICULTURAL AND FOOD CHEMISTRY

J. Agric. Food Chem. XXXX, xxx, 000

Phenolic Antioxidants and Antiatherogenic Effects of Marula (*Sclerocarrya birrea* Subsp. *caffra*) Fruit Juice in Healthy Humans

HAMUTAL BOROCHOV-NEORI,*,† SYLVIE JUDEINSTEIN,† AMNON GREENBERG,† BIANCA FUHRMAN,§ JUDITH ATTIAS,§ NINA VOLKOVA,§ TONY HAYEK,§ AND MICHAEL AVIRAM§

Southern Arava R&D, Mobile Post Hevel Eilot 88820, Israel, and Lipid Research Laboratory, Rappaport Faculty of Medicine, Technion—Israel Institute of Technology, Haifa 32000, Israel

Marula fruit chemistry and health

Convincing array of publications supporting a health positioning around the metabolic syndrome. Molecules and compounds such as phenols, polyphenols, catechins, epigallcatechins, flavonodis, seem to be responsible

This is supported by a body of grey and confidential literature

Thesis

Submitted in fulfilment of the requirements for the degree of doctor
at Wageningen University
by the authority of the Rector Magnificus
Prof. dr. M. J. Kropff,
in the presence of the
Thesis committee appointed by the Academic Board
to be defended in public
on Friday 25 October 2013
at 11 a.m. in the Aula

Penny Hiwilepo-van Hal

Processing of marula (*Sclerocarya birrea subsp. Caffra*) fruits: A case study on health-promoting compounds in marula pulp

Food Reviews International, 28:375–388, 2012

ISSN: 8755-9129 print / 1525-6103 online
DOI: 10.1080/87559129.2012.660716

Sclerocarya birrea (Marula), An African Tree of Nutritional and Medicinal Uses: A Review

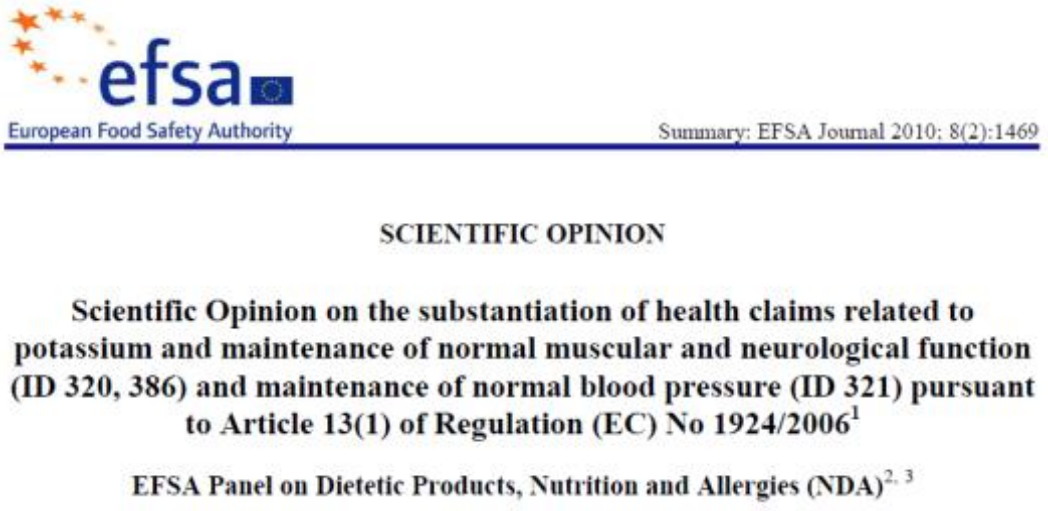
ABDALBASIT ADAM MARIOD[1] AND SIDDIG IBRAHIM ABDELWAHAB[2]

[1]Department of Food Science and Technology, College of Agricultural Studies, Sudan University of Science and Technology, Khartoum North, Sudan
[2]Department of Pharmacy, Faculty of Medicine, University of Malaya, Kuala Lumpur, Malaysia

Marula fruit chemistry and health

Table 2. Potassium content of Marula and other commonly consumed fruits

Fruit	K content (mg)	Fruit weight (g)
Marula flesh	**1250**	**50**
Marula Peel	**900**	**50**
Apricots (dried)	814	70
Banana	467	118
Dates	542	83
Kiwi	252	76
Melon, cantaloupe	494	160
Orange	237	131



efsa
European Food Safety Authority

Summary: EFSA Journal 2010; 8(2):1469

SCIENTIFIC OPINION

Scientific Opinion on the substantiation of health claims related to potassium and maintenance of normal muscular and neurological function (ID 320, 386) and maintenance of normal blood pressure (ID 321) pursuant to Article 13(1) of Regulation (EC) No 1924/2006[1]

EFSA Panel on Dietetic Products, Nutrition and Allergies (NDA)[2, 3]

BOX 1: European Food Safety Authority (EFSA) Claims

Scientific Opinion on the substantiation of health claims related to potassium and maintenance of normal muscular and neurological function (ID 320, 386) and maintenance of normal blood pressure (ID 321) pursuant to Article 13(1) of Regulation (EC) No 1924/2006

Muscular and neurological function

The claimed effects are "signal transduction and muscle contraction" and "nerve function". The target population is assumed to be the general population. The Panel considers that maintenance of normal muscular and neurological function is a beneficial physiological effect. On the basis of the data presented, the Panel concludes that a cause and effect relationship has been established between the dietary intake of potassium and normal muscular and neurological function.

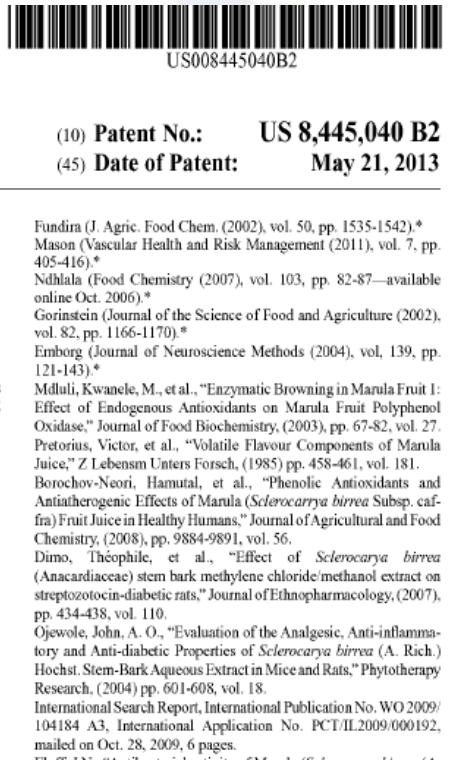
Blood Pressure

The claimed effect is "blood pressure". The target population is assumed to be the general population. The Panel considers that maintenance of normal blood pressure is a beneficial physiological effect. On the basis of the data presented, the Panel concludes that a cause and effect relationship has been established between the dietary intake of potassium and the maintenance of a normal blood pressure.

It may be possible to position marula fruit products as "high in Kalium" / "high in Potassium"

Marula fruit – relevant patent

- EP: Withdrawn with legal effect as of April 2017, no divisionals
- US: Granted, claims limited to treatment of atherosclerosis, no divisionals
- IL: Granted
- RSA: Granted as filed with PCT



US008445040B2

(12) **United States Patent**
Borochov-Neori et al.

(10) **Patent No.: US 8,445,040 B2**
(45) **Date of Patent: May 21, 2013**

(54) **EXTRACTS OF *SCLEROCARYA BIRREA***

(75) Inventors: **Hamutal Borochov-Neori**, Eilat (IL); **Amnon Grinberg**, Kibbutz Yotvata (IL)

(73) Assignee: **Management and Holdings—Ardom**, D.N. Eilot (IL)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **12/867,756**

(22) PCT Filed: **Feb. 19, 2009**

(86) PCT No.: **PCT/IL2009/000192**
§ 371 (c)(1),
(2), (4) Date: **Aug. 16, 2010**

(87) PCT Pub. No.: **WO2009/104184**
PCT Pub. Date: **Aug. 27, 2009**

(65) **Prior Publication Data**
US 2010/0311828 A1 Dec. 9, 2010

Fundira (J. Agric. Food Chem. (2002), vol. 50, pp. 1535-1542).*
Mason (Vascular Health and Risk Management (2011), vol. 7, pp. 405-416).*
Ndhlala (Food Chemistry (2007), vol. 103, pp. 82-87—available online Oct. 2006).*
Gorinstein (Journal of the Science of Food and Agriculture (2002), vol. 82, pp. 1166-1170).*
Emborg (Journal of Neuroscience Methods (2004), vol, 139, pp. 121-143).*
Mdluli, Kwanele, M., et al., "Enzymatic Browning in Marula Fruit 1: Effect of Endogenous Antioxidants on Marula Fruit Polyphenol Oxidase," Journal of Food Biochemistry, (2003), pp. 67-82, vol. 27.
Pretorius, Victor, et al., "Volatile Flavour Components of Marula Juice," Z Lebensm Unters Forsch, (1985) pp. 458-461, vol. 181.
Borochov-Neori, Hamutal, et al., "Phenolic Antioxidants and Antiatherogenic Effects of Marula (*Sclerocarrya birrea* Subsp. caffra) Fruit Juice in Healthy Humans," Journal of Agricultural and Food Chemistry, (2008), pp. 9884-9891, vol. 56.
Dimo, Théophile, et al., "Effect of *Sclerocarya birrea* (Anacardiaceae) stem bark methylene chloride/methanol extract on streptozotocin-diabetic rats," Journal of Ethnopharmacology, (2007), pp. 434-438, vol. 110.
Ojewole, John, A. O., "Evaluation of the Analgesic, Anti-inflammatory and Anti-diabetic Properties of *Sclerocarya birrea* (A. Rich.) Hochst. Stem-Bark Aqueous Extract in Mice and Rats," Phytotherapy Research, (2004) pp. 601-608, vol. 18.
International Search Report, International Publication No. WO 2009/104184 A3, International Application No. PCT/IL2009/000192, mailed on Oct. 28, 2009, 6 pages.

Option 1: Proceed, and if challenged by applicant we point out invalidity of claims, and possibly ABS issues too; they may seek to license, but they're in a weak position
Option 2: Challenge in court – but expensive
Option 3: To discuss…

(57) **ABSTRACT**

Provided are extracts obtained from the marula fruit (*Sclerocarya Birrea*) and uses thereof in a great variety of applications, e.g., use in food supplements for engendering an anti-atherogenic effect in healthy and non-healthy subjects (humans and non-human animals) and as agents for treating or preventing various diseases and disorders.

Marula fruit and potential consumer health targets

Figure 1: Possibilities for positioning marula fruit products in health sectors