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EDITOR / REDAKTEUR:

Naas Grové

LAYOUT / UITLEG:

Purple Tree Designs
purpletree@mweb.co.za

COVER PHOTO:

Willem Frost

PUBLISHER / UITGEWER:

Dendrological Society of South Africa /
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ADVERTISING / ADVERTENSIE:

secretary@dendro.co.za /
administration@dendro.co.za

MEMBERSHIP / LIDMAATSKAP:

administration@dendron.co.za

ADDRESS / ADRES:

Honorary Secretary / Ere-Sekretaris
Postnet 2054, Private Bag / Privaatsak 82234
Rustenburg, 0300
secretary@dendro.co.za /
administration@dendro.co.za

PHONE / FOON:

+(27) 82 575 4244

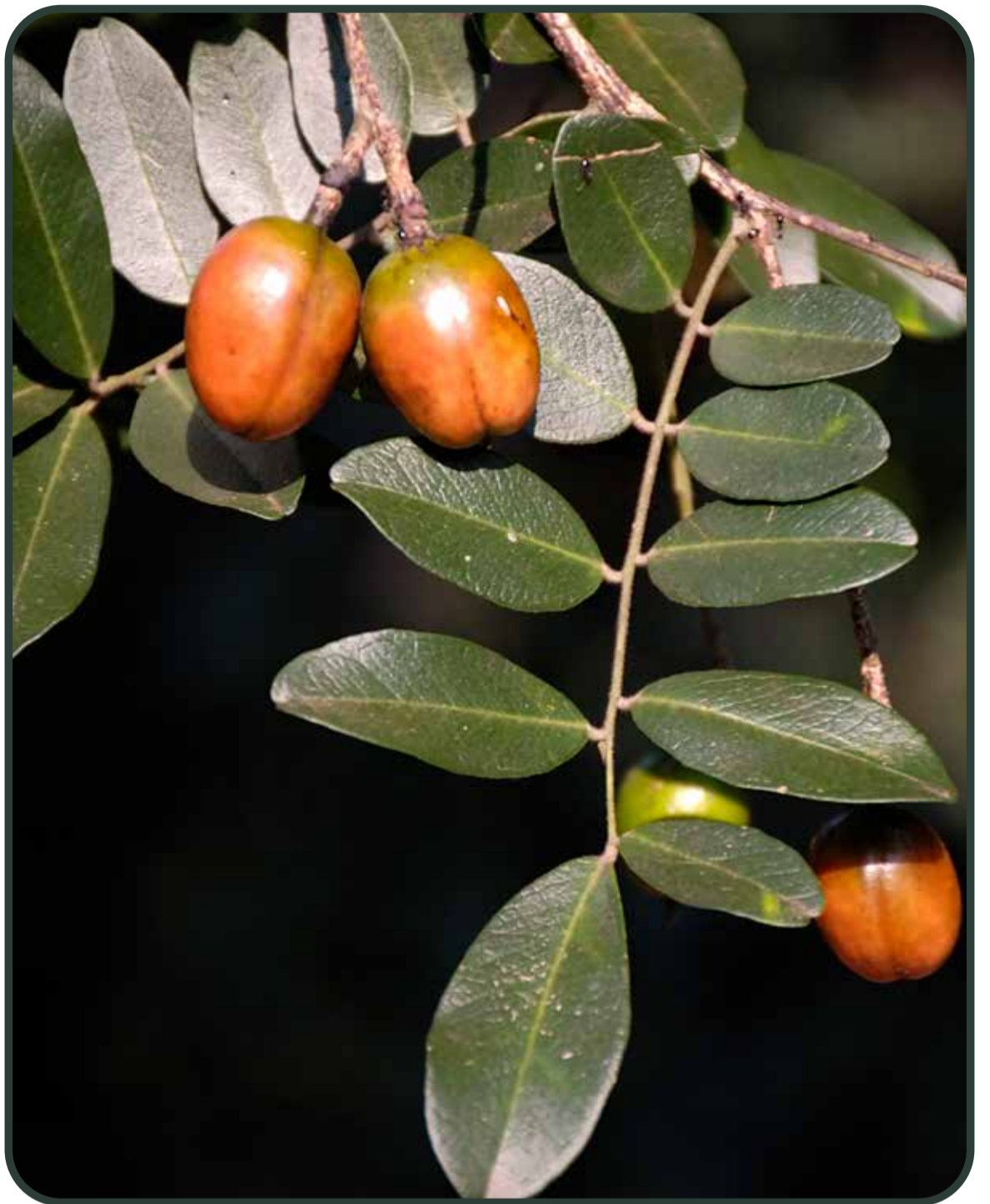
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Xanthocercis zambesiaca – njalaboom / nyalatree

Photo – Willem Frost





Die ingewikkelde web van lewe rondom ons

In die natuur se diversiteit word individue geproduseer – niks meer nie. Die ontelbare getalle lewende dinge is oorweldigend, en ons word deur ons nuuskierigheid gedwing om dit in 'n order te rangskik wat vir ons sin maak.. Hierdie is mensgemaakte name om sin te maak van die biologiese diversiteit. Dit beteken nie dat die lewende voorwerp vir wie ons die naam gegee het, homself aan dié naam sal herken nie. Dit maak egter nie saak nie, want uiteindelik sal dit ons waardering en soeke na begrip van hierdie ingewikkelde web van lewe rondom ons verdiep.

To do that it requires us to recognise the depth of the interconnectedness of all living things. We do not live in a bubble. All our actions, positive and negative have potentially far-reaching impacts on all living things and the environment. We share this *Pale Blue Dot* as Carl Sagan refers to our planet earth, with countless other species and here are a few ways to deepen our appreciation:

- Recognise the crucial role played by each species, no matter how small or big, from pollinators like bees to the apex of the food chain where the big cats reign – everyone contributes to the stability and health of the environment
- Preserving natural ecosystems is vital for

maintaining biodiversity. This can be done by establishing and expanding protected areas, to promote sustainable agricultural practices, and participate in reforestation, wetland restoration and waste land rehabilitation initiatives.

- Support and join conservation organisations and raise awareness about the importance of ecosystems and diversity to ensure the well-being of future generations
- We all know about symbiotic relationships and how they have evolved on one another for survival. Where would we be without the fascinating symbiotic relationships between lichens, mosses, fungi, algae, wasps and bacteria – all are a fundamental aspect of the existence and evolution of life on Earth.

If we want to succeed in understanding and appreciating this uniqueness of nature producing individuals, we will have to be serious about addressing the challenges facing us. We need collaborate efforts, increased law enforcement and community engagement to ensure the preservation of South Africa's unique and diverse biodiversity.

Naas Grové
February 2025



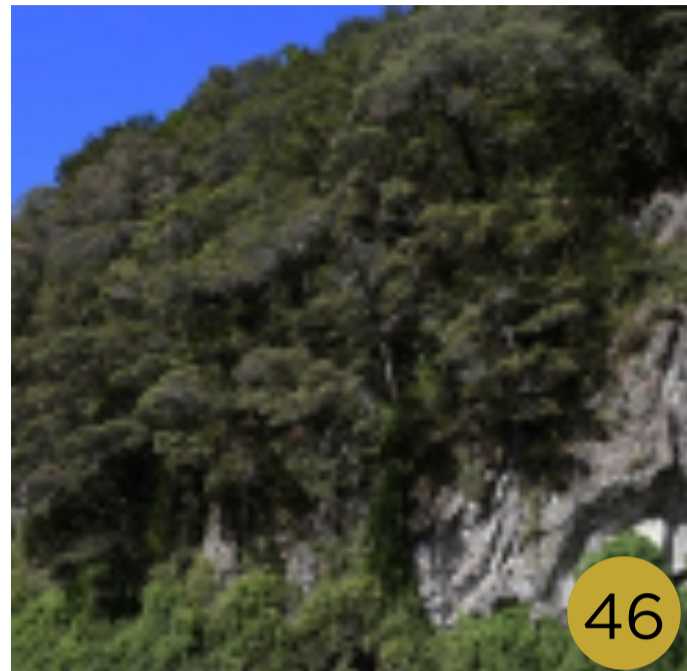
Tree of life – AI generated picture (Freepik Content Licence Agreement Clause 8)

INHOUD / CONTENT



CAM photosynthesis in succulent plants. Why do they grow so slow? A physiological outlook.	6
Die gebruik en impak van die tradisionele medisyne kultuur op die inheemse bome van Suid-Afrika	12
Soetany'sberg	22
The Flora of the Galápagos Islands	30
Frost damage observed in Pretoria after very cold weather in July 2024	40
Die ionakanniedood (<i>Commiphora omundomba</i>), 'n nuwe boomspesie vanuit Angola en Namibië	44





SOUTHERN BEECH FORESTS, with special reference to the temperate rain forests of New Zealand	46
PIONIERSJAG - 'n Dendrologiese perspektief	52
Changes to the list of Southern African indigenous trees	55
The National Register of Big Trees© in South Africa - Annual Report	62
Jaarverslag: Pilanesbergtak, Rustenburg	67
Jaarverslag: Waterbergtak	69
New publications	70
Meg Coates Palgrave Eulogy	71



CAM photosynthesis in succulent plants

Why do they grow so slow? A physiological outlook.

Hendri Pretorius. M.Sc., Plant Physiology, University of the Free State

Senior Officer: Professional Services

Plant Sciences

Faculty: Natural and Agricultural Sciences

PO Box 339, Bloemfontein 9300, Republic of South Africa

051 401 9787 | HPPretorius@ufs.ac.za

Owner and founder of Sukkelenten (Pty) Ltd. (T/A Future Plants)



INTRODUCTION

Photosynthesis is widely studied area within the realm of plant physiologists. Photosynthesis occurs in all “green” living organisms like plants, green algae and some protist and bacteria. Many studies related to the topic has been done in the past and continues to this day. Research in photosynthesis presents an orderly historical development leading to the present understanding thereof. The groundwork for the current understanding of photosynthesis was done in 1905 by F. Blackman, where it was established, that photosynthesis is a two-part process (Blackman, 1905).

These two processes are called the “light dependant”, or “light reaction” and the other is the “light independent” or “dark reactions”. The latter was discovered and studied in detail by Melvin Calvin in 1950 (Bassham *et al.*, 1950) and was named the “Calvin cycle”. These are fascinating process which involves the bare minimum input of elements, eventually leading to the production of sugars and other compounds. Photosynthesis is basically the process in which plants absorb radiation energy (light energy) and convert it to chemical energy. This in turn is used to convert inorganic carbon dioxide (CO_2) from the atmosphere and water (H_2O) from the soil to organic molecules ($\text{C}_6\text{H}_{12}\text{O}_6$; Glucose), releasing oxygen (O_2) and water (H_2O) as byproducts. Photosynthesizing plants and green algae are the primary producers on earth which allows most food chains to function and ultimately ensures the survival of most species (Salisbury and Ross, 1991).

Numerous plant species live in arid climates, among which are the succulent plants. These types of plants have both constitutive and metabolic adaptations to deal with drought conditions. Succulents have xeric characteristics like thick cuticle, sunken stomata, low surface to volume ratio, low transpiration rates and adapted photosynthetic pathways to name a few. Most of their leaves or parts of the plant have special adaptations to store water. These plants usually lack a well-developed palisade layer of cells, and most of the leaf or stems consists of spongy mesophyll cells in which water is stored in the large vacuoles (Gibson, 1982).

There are basically 3 types of photosynthesis that occurs in plants. The first type of photosynthesis occurs

in the so called C_3 plants and occurs in the majority of plants species. These plants use a 3-carbon molecule in the Calvin cycle know as 3-phosphoglycerate (3PGA) to generate glucose. All the steps occur within the cell and is not separated by time or location within the cell. The second type of photosynthesis occur in C_4 plants which use a four- carbon molecule, Oxaloacetate (OAA), to produce sugars in the Calvin cycle. In C_4 plants, the steps occur in different cells within the plants, but at the same time during the day. Lastly, CAM (Crassulacean Acid Metabolism) uses the same C_4 carbon molecule, OAA, to produce sugars, but in this case the steps happen in the same cell, but at different times of the day (night and day) (Ranson and Thomas, 1960; Russell *et al.*, 2019).

Plant physiologists observed that succulent plants have a different type of photosynthesis compared to other plants. The mechanism of photosynthesis in succulent plants was first studied in the family Crassulaceae, therefore the process was named after the family (Crassulacean Acid Metabolism; CAM) (Ranson and Thomas, 1960). CAM is present, but not limited to approximately 25 other plant families including the Orchideaceae, Bromeliaceae and Euphorbiaceae. (Russell *et al.*, 2019).

Plants which photosynthesize using CAM usually grow in arid, or water stressed regions like deserts or semi-arid areas and even salt marshes. Like all plants, succulents must photosynthesize, meaning they must obtain water (H_2O) from the soil and absorb carbon dioxide (CO_2) from the atmosphere. Succulent plants usually do not open their stomata during the day because that will lead to a higher rate of water loss through transpiration (Salisbury and Ross, 1991). That also results in gas exchange being limited during the day. Furthermore, light is not available during the night when stomata are open. If CO_2 is unavailable during the day, and light is unavailable at night, these plants need to have an adapted metabolism in order to photosynthesize. This is done by fixing CO_2 into Malic acid at night when stomata are open. Then, during the day, Malic acid is broken down in the presence of light and metabolized into the needed sugars ($\text{C}_6\text{H}_{12}\text{O}_6$) in the Calvin cycle. CAM happens two phases divided by time.

PHOTOSYNTHESIS – THE PROCESSES

To understand CAM photosynthesis, we must first address photosynthesis as a concept. The minimum equation for photosynthesis is give below:



These steps have a vast array of chemical reactions.

These processes happen in the so called “light dependant” and in the “light independent” reactions. C_3 photosynthesis happens in the majority of plant species and is the basis on which C_4 and CAM is based. Therefore, C_3 photosynthesis must be addressed first in order to understand C_4 and CAM.

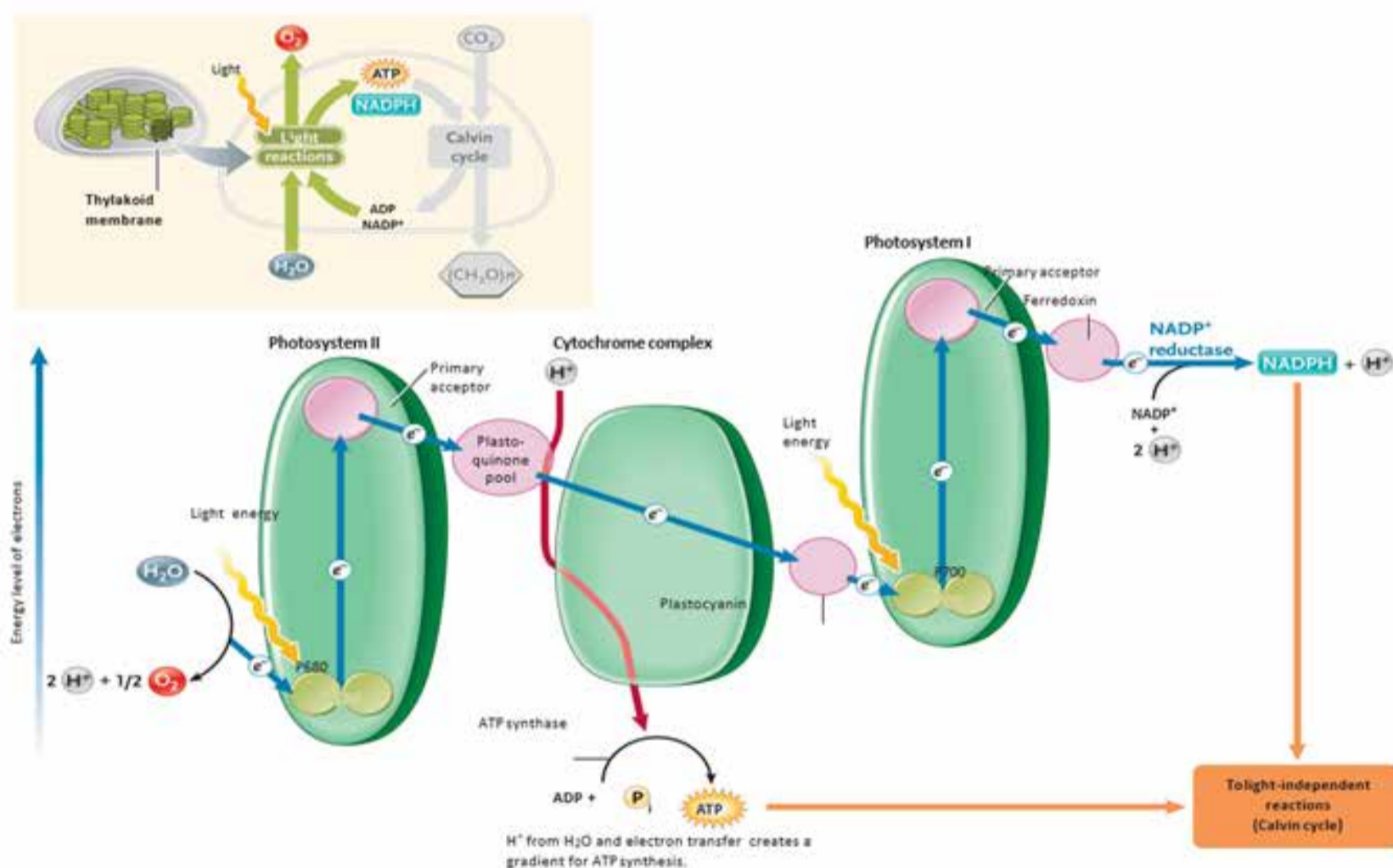
C_3 photosynthesis

C_3 PHOTOSYNTHESIS LIGHT DEPENDENT REACTIONS:

During the light dependent reactions (light phase), chlorophyll molecules in the chloroplasts absorb light energy, which excite electrons to higher energy levels. Using the splitting of water as a source of electrons and protons the absorbed energy is temporarily trapped in Nicotinamide adenine dinucleotide phosphate (NADPH) and Adenosine triphosphate (ATP; energy). These two products play a critical role during photosynthesis. Light-absorbing pigments like chlorophyll are bound to proteins and other molecules in thylakoid membranes (lamellae and grana). Within the chloroplasts, there are two large protein complexes called the photosystems (I and II). The light energy harvested form the sun moves through these photosystems, ultimately yielding NADPH and ATP (Figure 1).

Red light contains the exact amount of energy to excite the electrons in the antenna complex of both photosystems. Both photosystem I and II contains each its own unique pair of specialized chlorophyll molecules (reaction centres), as it differs in the red-light wavelength required to excite its electrons (700nm and 680nm).

The light dependent reaction of photosynthesis is based on the “linear flow of electrons” to drive the light dependent reactions and is also known as the Z-scheme (Figure 1.) The Z-scheme refer to electrons that move in a typical “Z” form. The scheme presents the relative position of the different electron transport clusters (mostly protein complexes) within the thylakoid membranes. (Russell *et al.*, 2019).



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Figure 1: The Z-scheme depicting the flow of electrons form the harvesting pigments to NADPH and ATP (Russell *et al.*, 2019).

The second phase of photosynthesis, which is light independent, deals with the fixation of atmospheric CO_2 into organic molecules ($\text{C}_6\text{H}_{12}\text{O}_6$) through the Calvin cycle (Figure 2). The Calvin cycle occurs in the stroma of the chloroplast. The process requires energy (ATP) and NADPH from the light dependent reactions, occurring in and on the thylakoid membranes of the chloroplast.

The Calvin cycle occurs in three phases. The first phase is Carbon fixation where CO_2 is added to ribulose 1,5 biphosphate (RuBP), which is a five carbon molecule. The resultant is an unstable six carbon molecule which is immediately cleaved into two identical three carbon molecules, 3-phosphoglycerate (3PGA). The enzyme responsible for this is RuBP carboxylase/oxygenase (Rubisco). The correct scientific name is Ribulose 1,5 biphosphate carboxylase/oxygenase, which is a dual

function enzyme since it has the affinity to bind CO_2 or O_2 . Plants fixing CO_2 in this way is known as C_3 plants, hence the 3C 3PGA which is the starting block molecule in the Calvin Cycle.

Phase two is the reduction phase and happens in two steps. Phosphorus from ATP and electrons and protons from NADPH reduces 3PGA to Glyceraldehyde-3-phosphate (G3P). The fate of G3P is to regenerate RuBP and exits the cycle to build the six-carbon molecule, glucose ($\text{C}_6\text{H}_{12}\text{O}_6$). Glucose is the final product of photosynthesis.

The third phase of the Calvin cycle is the regeneration phase. G3P is concerted back to the acceptor molecule, Ribulose 1,5-biphosphate, which completes the Calvin cycle. This is a multistep phase but is simplified in Figure 2 showing it as a single step (Russell *et al.*, 2019).

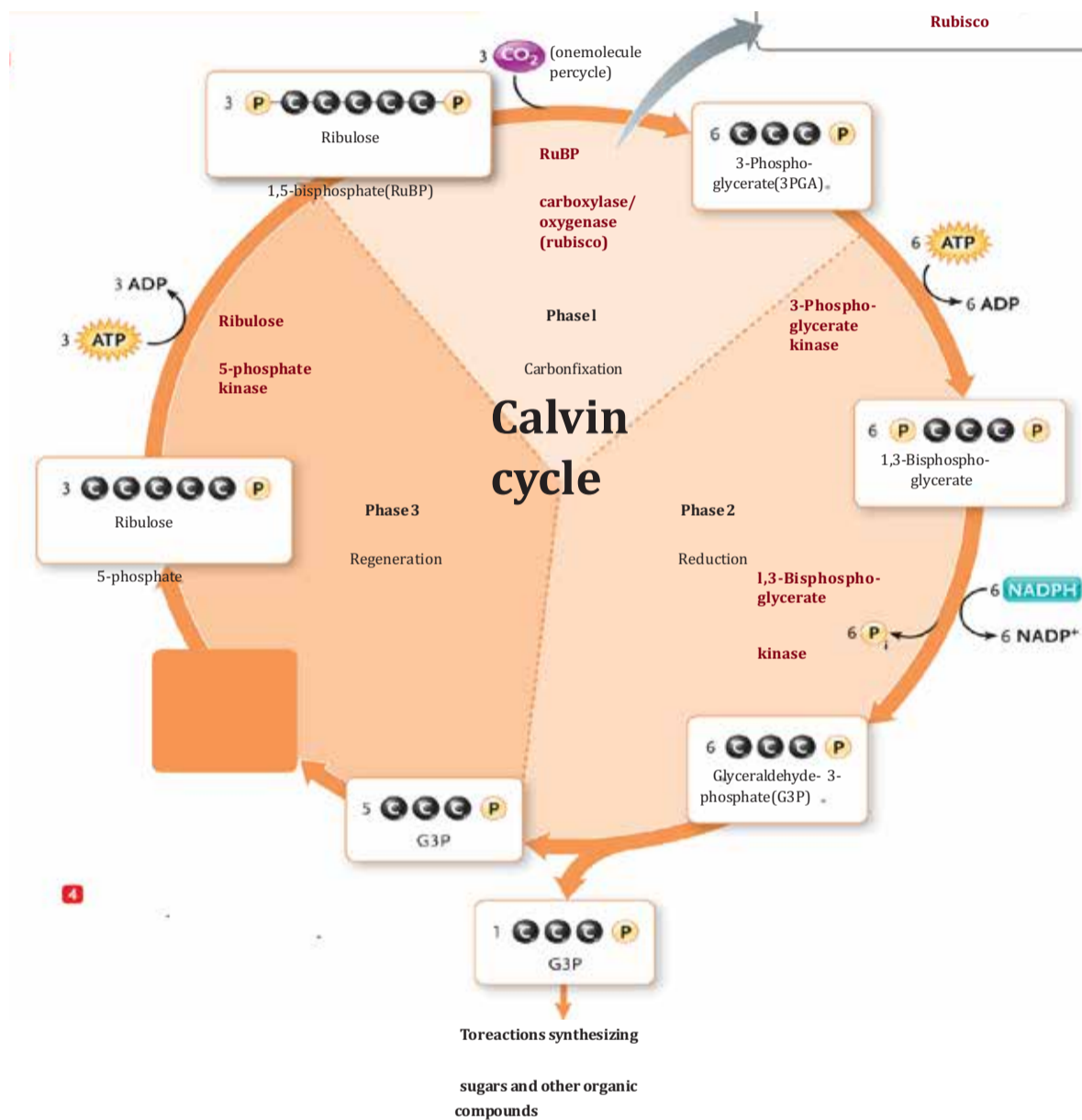


Figure 2: The Calvin-Cycle. Note the three steps during the Calvin-Cycle, carbon fixation, reduction and regeneration (Russell *et al.*, 2019).

To fully understand the Calvin cycle, the following is important. During each turn, one CO_2 is converted into a one carbon precursor molecule (CH_2O). Thus, it takes three turns ($3 \times \text{CO}_2$) to produce a single molecule of G3P. It takes six turns ($6 \times \text{CO}_2$) to produce two molecules of G3P. A fourth phase in carbon fixation lies

outside the Calvin cycle. This generates a six carbon molecule namely glucose ($\text{C}_6\text{H}_{12}\text{O}_6$). Thus, G3P, a three carbon molecule is the primary building block of organic glucose ($\text{C}_6\text{H}_{12}\text{O}_6$) and two G3P molecules are required to produce a single glucose molecule.



C₄ PHOTOSYNTHESIS AND PHOTORESPIRATION

To address C₄ and CAM photosynthesis, we must also understand why plants use alternative types of photosynthesis opposed to C₃ photosynthesis. Photorespiration is the main driving force for the use of alternative types of Photosynthesis as well as the ability of Rubisco to act as a dual function enzyme.

Photorespiration:

What is photorespiration? Photorespiration is a respiratory process in many higher plants by which they take up O₂ during the day and release CO₂, which is contradicting the general process of photosynthesis. This can cause a buildup of O₂ in cells, of which the plants must metabolize. As light intensity and temperatures increases, so does the rate of photorespiration.

Photorespiration occurs because of the evolutionary development of Rubisco to accept both CO₂ and O₂ as substrates. These processes occur in the presence of light and the rate at which photorespiration occurs depends on the concentrations of O₂ and CO₂ in the cells. With insufficient gas exchange in succulents during the day, there is a buildup of O₂ in the cell. Rubisco then binds O₂ instead of CO₂ to form one molecule of 3PGA and an unstable molecule of Phosphoglycolate. This is counterproductive to photosynthesis, as it releases CO₂ instead of fixing it, while wasting ATP and NADPH in the process. Detoxification through photorespiration reduces overall photosynthesis efficiency and impairs plant growth. To overcome or prevent the effect of photorespiration, a small group of plants had evolutionary evolved different photosynthetic mechanisms namely C₄ & CAM photosynthesis.

C₄ Photosynthesis:

To make the C₄ pathway possible, unique metabolic and morphological adaptations need to be in place.

Morphological adaptations include cell arrangement where mesophyll cells are close to stomata and surround specialized bundle sheath cells surrounding the vascular tissue (phloem). This cell arrangement is known as the Kranz anatomy. The first CO₂ fixation occurs in the mesophyll cells and the final carbon fixation through the Calvin cycle in the bundle sheath cells, thus a "Division in labour".

Some plants in hot, dry environments use the C₄ mechanism to minimize photorespiration. C₄ plants have different leaf cells namely the mesophyll cells and bundle sheath cells. There is a "division in labour" between these cells, each with its own specialization. In the mesophyll cells, CO₂ diffuses through open stomata from atmosphere into the cells. CO₂ reacts with phosphoenolpyruvate (PEP) in the stroma of the cell to form oxaloacetate (OAA), a four-carbon molecule, hence the name C₄ photosynthesis. The enzyme responsible for fixing CO₂ is PEP carboxylase. OAA is reduced to a transportable product, Malate (Figure 3).

In the bundle Sheath cells, Malate is transported from mesophyll cells to bundle sheath cells. Malate is de-carboxylated to Pyruvate, releasing CO₂ at the level of Rubisco, forcing its carboxylation function. Rubisco fix CO₂ through the Calvin cycle producing glucose (C₆H₁₂O₆), using ATP and NADPH from the light dependent reactions. Pyruvate is transported back to the mesophyll cell where it is converted back to PEP, using ATP and NADPH from the light dependent reactions. This completes the preceding CO₂ fixing, concentrating and transport mechanism in C₄ plants. C₄ plants are more efficient at fixing CO₂ than C₃ plants but require more ATP. The additional ATP comes from the cyclic electron flow system (Russell et al., 2019).

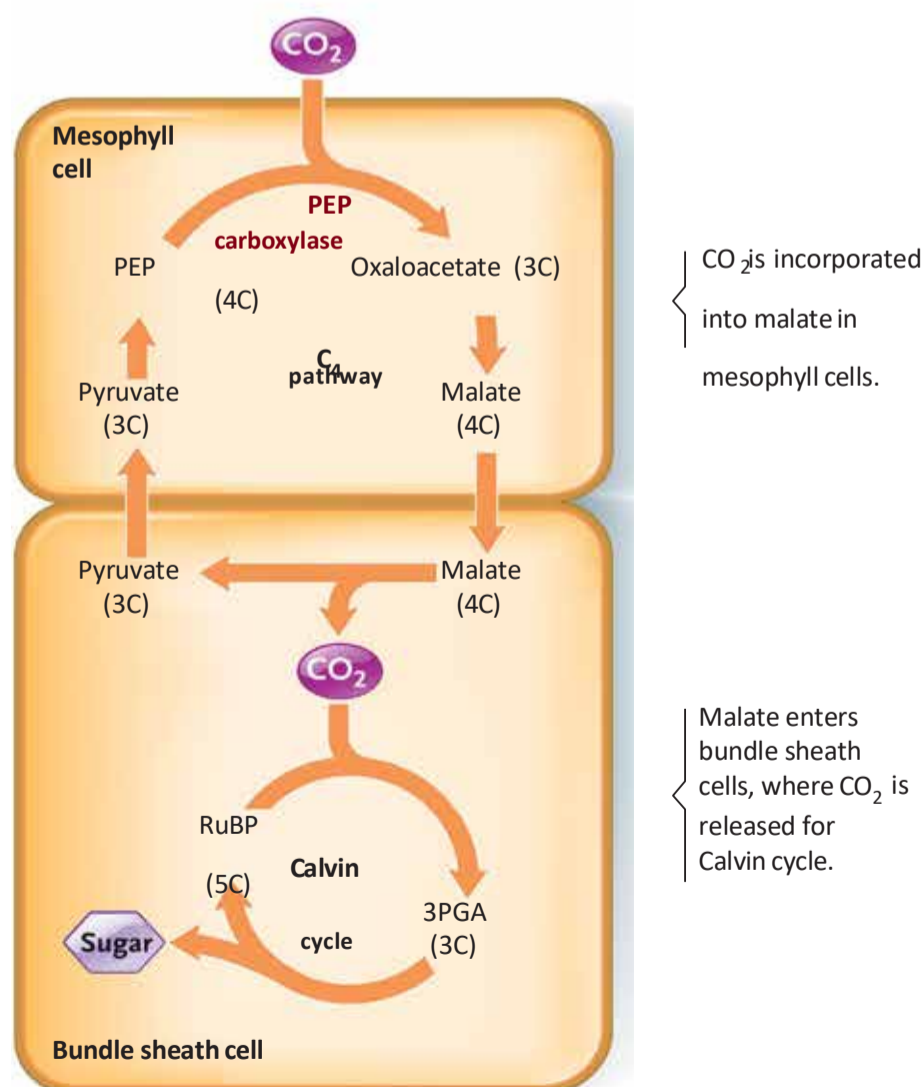


Figure 3: C₄ Photosynthesis. This type of photosynthesis occurs in two different adjacent cells, namely the mesophyll- and Bundle sheath cells (Russell et al., 2019)

THE CAM PATHWAY:

Plants making use of CAM photosynthesis essentially uses the same steps as the C_4 pathway, but with the following differences. There is no specific cell arrangement (Kranz anatomy) as in C_4 plants and the leaves of these plants consists of mesophyll cells only. Carbon fixation and the Calvin cycle both occur in the mesophyll cells but occur at different times. Thus, the process happens as a "Division in time". The first Carbon fixation (CO_2) occurs at night and the second carbon fixation happens during the day (Calvin cycle) (Figure 4).

CAM plants like cacti and other succulent plants can survive in dry regions, where the days are hot, and the nights are colder. To survive, these plants must conserve water as far as possible. From the minimum equation of photosynthesis, water is one of the elements needed during photosynthesis. Since water is a limiting factor

in arid regions, CAM plants open their stomata at night when temperatures are lower to fix CO_2 into OAA, which is then converted to malate. Since its dark and no light available for photosynthesis, Malate accumulates and is transported to the large vacuoles as Malic acid. During the day, the stomata close to conserve water, limiting the entry of CO_2 into the cells. Malate diffuses passively from the vacuoles where it is de-carboxylated to pyruvate to release CO_2 . Pyruvate is converted back to phosphoenolpyruvate (PEP) by Rubisco (Ribulose 1,5-bisphosphate carboxylase/oxygenase) and is stored. At night, stomata open to absorb CO_2 to complete the cycle. Like C_4 plants, CAM uses the same 2 carboxylation enzymes. PEP carboxylase is used during the night fix CO_2 and Rubisco is used during the day, until the malate pool is depleted. Of all plants, CAM plants grow the slowest, due to limited PEP / Malate pool sizes. (Russell *et al.*, 2019).

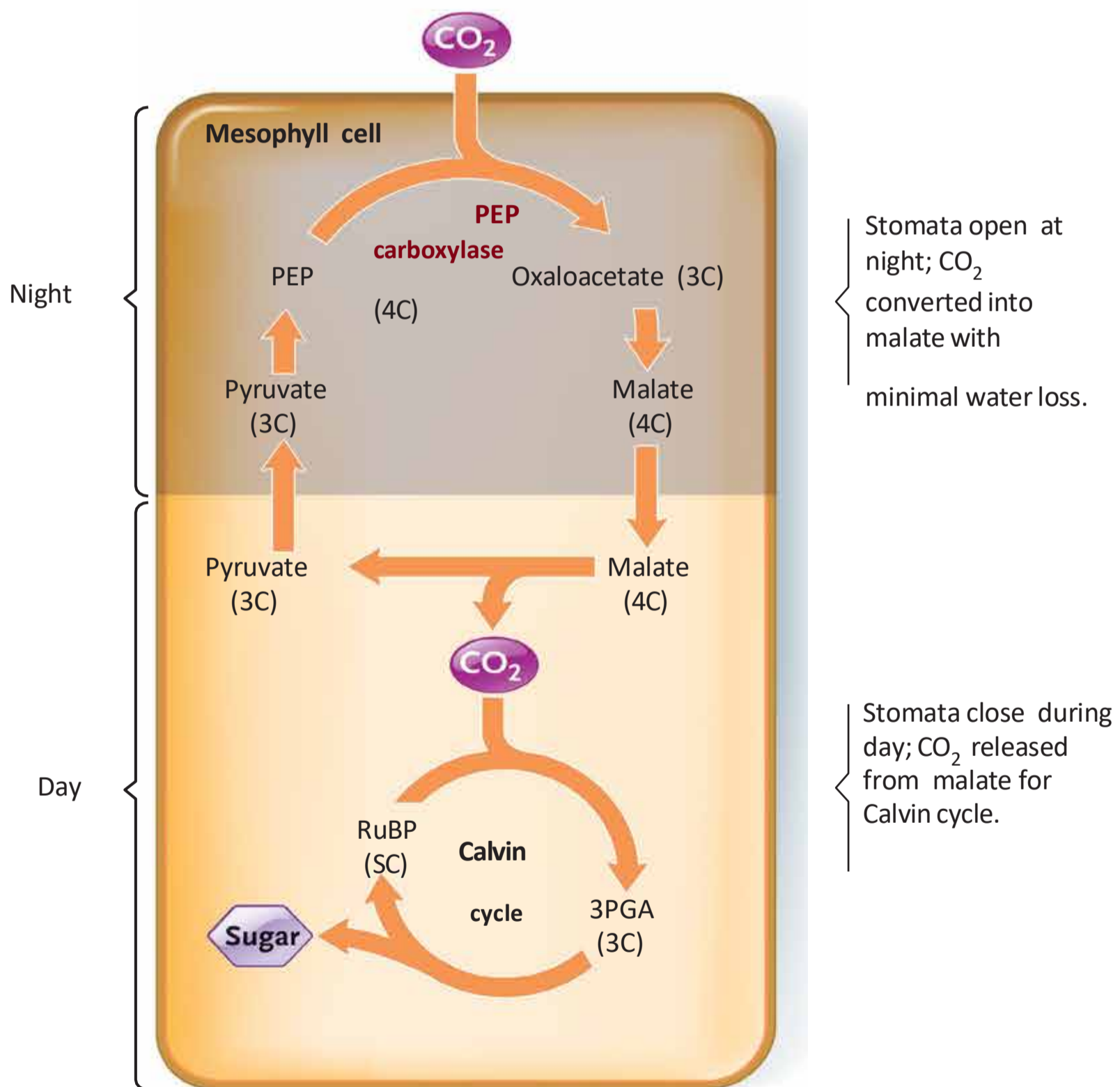


Figure 4. CAM photosynthesis. Highlighted in grey are the steps occurring during the night and below that the steps occurring during the day when light is present (Calvin cycle) (Russell *et al.*, 2019)

CAM photosynthesis is not an obligate pathway. If stomata are open during the day, CO_2 may be absorbed and fixed in a usual way, bypassing CAM. CAM photosynthesis is in fact quite inefficient, but

it does permit photosynthesis to continue under extreme xeric conditions. CAM Photosynthesis is thus not a replacement for C_3 photosynthesis, but rather a precursor to C_3 photosynthesis.

CONCLUDING REMARKS

Plants growing in arid, or water depleted areas must be morphologically and physiologically adapted to survive the extreme conditions. Succulents which photosynthesize using CAM has a much slower rate of photosynthesis than plants using alternative methods of photosynthesis. Because there is a two-part photosynthesis divided by time, these plants have an overall slower metabolic rate. If water is frequently a limiting factor in plant growth, why are there not more plants using CAM photosynthesis? Reason partially is that CAM photosynthesis results in slow growth because it is energy expensive. CO₂ accumulation during the

night is less efficient than during the day when it is accompanied directly by CO₂ assimilation through photosynthesis (Edwards *et al.*, 1982). CO₂ is fixed into malic acid where after it is transported to storage vacuoles, a process requiring much ATP (Lüttge *et al.*, 1982). During the subsequent day period, the malic acid is further metabolized to CO₂ before photosynthesis occurs. It appears that slow growth is a consequence of high energy input, a negative aspect of CAM. Thus, Extreme light and prolonged water scarcity and high energy input during CAM are the key factors limiting the growth rate of succulent plants.

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Die gebruik en impak van die tradisionele medisyne kultuur op die inheemse bome van Suid-Afrika

Dr Johan van der Hoven (teorie komponent ter gedeeltelike voltooiing van die Dendroloog Vlak II eksamen)

Die gebruik van inheemse plante deur veral tradisionele gemeenskappe en tradisionele genesers van alle bevolkingsgroepe kom wydverspreid in Suid-Afrika voor. Beperkte kennis daaromtrent deur beide die algemene bevolking en boomliefhebbers is ongelukkig die *status quo*. Selfs onder meer gesofistikeerde gedeeltes van die bevolking, is daar 'n toenemende voorkeur vir "natuurlike" medisyne. Medisyne in die vorm van fyngemaalde boombas gemeng met dooie kewers, akkedismis en wat nog, het blykbaar meer genesingswaarde as wetenskaplik ge-ekstraerde en veredelde produkte soos opgedis

deur sogenaamde "Big Pharma". 'n Stelling soos hierdie sal natuurlik op sekere tone trap. Nietemin, daar is, as gevolg van bevolkingstoename enersyds, asook kulturele, sosiologiese, ekonomiese en vele ander faktore, toenemende druk op plante en dus ook bome vir medisinale gebruik. Baie boomspesies wat vir medisinale gebruike benut word, kan die druk wat daardeur op plantbevolking geplaas word hanteer, maar daar is ongelukkig sekere spesies, wat vir die voortbestaan daarvan, vanweë hierdie gebruike, onder geweldige druk verkeer.



'n Sakeman êrens in Afrika hard aan die werk om Prunus africana bas te versamel vir die plaaslike mark sowel as uitvoer na Europese markte met sy oes regs bo en die resultaat regs onder. (Foto met erkenning van Cunningham et al vanaf publikasie nommer 14 in bronnelys)

Daar is en word gelukkig wyd navorsing gedoen en baie gepubliseer oor hierdie verskynsel, gemik daarop om die impak op bedreigde en onbedreigde plante te identifiseer en onder die aandag te bring. Interessant egter, is dat meeste publikasies fokus op die plantkoninkryk as geheel en nie soseer net op bome as sodanig nie. Ook is meeste van die publikasies in vaktydskrifte en op akademiese platforms, wat uiteraard daartoe lei dat die lekepubliek nie so ingelig en bewus is van die omvang en spesifieke gerigtheid van die probleem nie. Hierdie skrywe sal poog om te fokus op inheemse bome spesifiek en is primêr gerig op die amateurboomliefhebber. Die oogmerk is om sy of haar belangstelling in die onderwerp te stimuleer en om hom of haar daardeur 'n

basiese kennis oor die onderwerp te laat opdoen. Hopelik sal die spesifieke teikengroep genoeg geprikkel word om die artikel enduit te lees en dan meer belangstelling in die onderwerp ontwikkel. Dit kan dan lei tot groter bewusmaking van die omvang van die praktyk en gepaardgaande probleme. Die ander groep, naamlik die professionele wetenskaplikes, natuurbewaarders, dendroloë en biodiversiteitskundiges kan dus sommer nou maar ophou verder lees as hulle dalk al tot hier gevorder het!

Enkele interessante punte:

- Meer as 30 000 verskillende plantspesies word in Suid-Afrika aangetref. (verwys - Medicinal Plants of South Africa deur van Wyk, van Oudtshoorn en Gericke, Briza Publikasies)
- Daarvan word ongeveer 10%, dit wil sê nie minder nie as 3000 benut vir medisinale gebruike.
- Wat interessant is, uit die publikasies beskikbaar, is dat daar uit die aard van die saak, gewoonlik nie onderskeid gemaak word tussen of die betrokke plant boomstatus geniet of nie. Daar word onder die bedreigde spesies as gevolg van hierdie praktyk ook nie onderskeid gemaak tussen bome en "nie-bome" nie. Die boomkyker moet dus die bome hier ter sprake, gaan uitsoek tussen al die plante, soos gelys.
- Van die plantspesies wat vir medisinale toestande gebruik word, soos gelys in die bogenoemde publikasie, geniet ongeveer 68 "boomstatus". "Boomstatus" word aan 'n plant toegeken as die plant as "boom" gelys word in die "Saklyns van Suider-Afrikaanse Bome 2014." Vir die doel van hierdie publikasie word aalwyne en broodbome wat "boomstatus" geniet, uitgesluit. Dit is nie 'n volledige lys van bome wat vir medisinale doeleindes benut word nie maar fokus op die meer algemene en meer bekende bome wat dus ook vir die amateurboomkenner meer bekend mag wees. Vervolgens 'n lys van boomspesies, wat vir die doel van medisyne benut word, geneem uit bogenoemde publikasie, tesame met die medisinale gebruik vir elke spesie.

Spesie	Medisinale gebruik
<i>Acokanthera oppositifolia</i> - boesmangif	hoofpyn, slangbyt
<i>Adansonia digitata</i> - kremetart	koors, bloed hoes
<i>Albizia adianthifolia</i> var. <i>adianthifolia</i> - platkroon	velsiektes
<i>Albizia anthelmintica</i> - wurmbasvalsdoring	intestinale parasiete
<i>Balanites maughamii</i> subsp. <i>maughamii</i> - groendoring	bilharzia, braakmiddel
<i>Bersama lucens</i> - blinkblaarwitessenhout	impotensie, infertiliteit
<i>Capparis tomentosa</i> - wollerige kapperbos	rumatiek, geelsug
<i>Catha edulis</i> - boesmanstee	hoes, asma, stimulant
<i>Croton gratissimus</i> var. <i>gratissimus</i> - laventelkoorsbessie	koors, hoes, swelling
<i>Curtisia dentata</i> - assegaai	maagkwale, afrodisiak
<i>Dodonaea viscosa</i> var. <i>angustifolia</i> - smalblaarsandolien	griep, masels
<i>Dombeya rotundifolia</i> var. <i>rotundifolia</i> - blompeer	enema
<i>Ekebergia capensis</i> - essenhout	sooibrand, disenterie
<i>Elaeodendron transvaalense</i> - bosveldsaffraan	enema, koors, diarree
<i>Erythrina lysistemon</i> - koraalboom	sere, absesse, wonde, artritis
<i>Erythrophleum lasianthum</i> - maputalandoordeelboom	migraine
<i>Euclea undulata</i> - gewone ghwarrie	hartkwale
<i>Harpephyllum affrum</i> - wildepruim	braking
<i>Heteromorpha arborescens</i> var. <i>abyssinica</i> - gewone pietersielieboom	koliek
<i>Heteropyxis natalensis</i> - laventelboom	verkoue
<i>Jatropha curcas</i> * - purgeerboontjie	wonde, purgasie
<i>Kigelia africana</i> - worsboom	sifillis
<i>Lannea discolor</i> - dikbas	diaree
<i>Lippia javanica</i> - koorsbossie	koors
<i>Ocotea bullata</i> - stinkhout	bloeddruk, oogprobleme
<i>Olea europaea</i> subsp. <i>africana</i> - olienhout	bloeddruk, nierfunksie
<i>Pittosporum viridiflorum</i> - kasuur	pyn
<i>Protea repens</i> - suikerbos	hoes, diabetes
<i>Prunus africana</i> - rooistinkhout	prostaat probleme, borspyn
<i>Ptaeroxylon obliquum</i> - nieshout	hoofpyn, rumatiek
<i>Rapanea melanophloeos</i> - Kaapse boekenhout	hartprobleme
<i>Rauvolfia afra</i> - kinaboom	koors, malaria, histerie
<i>Rhoicissus tridentata</i> subsp. <i>cuneifolia</i> - noordelike boesmansdruif	nier, blaas
<i>Salix mucronata</i> subsp. <i>woodii</i> - fluitjieswilger	rumatiek
<i>Schotia brachypetala</i> - huilboerboon	babelaas
<i>Sclerocarya birrea</i> subsp. <i>afra</i> - maroela	disenterie
<i>Securidaca longepedunculata</i> - krinkhout	tandpyn, sere
<i>Strychnos henningsii</i> - rooibitterbessie	naarheid
<i>Syzygium cordatum</i> - waterbessie	tering
<i>Tarchonanthus camphoratus</i> - kanferbos	maagprobleme
<i>Terminalia sericea</i> - vaalboom	oogprobleme
<i>Tetradenia riparia</i> - gemmerbos	respiratoriese probleme
<i>Trichilia emetica</i> subsp. <i>emetica</i> - bosveldrooiessenhout	maagkwale
<i>Vachellia karroo</i> - soetdoring	diaree
<i>Warburgia salutaris</i> - peperbasboom	slymerige hoes
<i>Zanthoxylum capense</i> - kleinknophout	winderigheid
<i>Ziziphus mucronata</i> - blinkblaar-wag- -bietjie	hoes, ekspektorant

* Meerjarige uitheemse plant, inheems aan tropiese Amerika, maar die presiese oorsprong daarvan is nog onseker

Hierdie lys is beslis nie volledig nie, maar bied 'n redelike beginpunt aan die boom liefhebber wat bome met medisinale status wil bestudeer of van kennis wil neem. Dit gee ook 'n aanduiding van hoe omvangryk

die praktyk is en hoe gereeld bekende bome onder die lys val. Vanweë gebrek aan spasie word die medisinale gebruike van elke spesie hierbo gelys nie in detail bespreek nie. Die leser word verwys na publikasies genoem vir verdere inligting. Die publikasie (Van Wyk et al) bo na verwys en bogenoemde lys fokus op die meer algemene en bekende bome hier ter sprake.

- e. Dit is vir die boomkyker sommer dadelik duidelik uit bogenoemde lys dat daar onder die lys van baie skaars tot erg talryke spesies voorkom. Sekere spesies word dus waarskynlik min geaffekteer deur die gebruike ter sprake terwyl daar spesies is wat potensieel erg bedreigd mog wees daardeur.
- f. Daar is verskeie publikasies wat lig werp op plantspesies wat deur medisinale "oes" onder druk verkeer, maar weereens word nie onderskeid gemaak tussen spesies met boomstatus en die sonder boomstatus nie. Die webspasie van die Suid-Afrikaanse Nasionale Biodiversiteitsinstituut (SANBI), is seker die beste plek om die bedreigdheidsstatus van 'n spesie uit na te vors. SANBI publiseer 'n lys van plante op die sogenaamde "rooilys", met 'n klassifikasie van hoe bedreigd 'n betrokke spesie is volgens sy "bedreigdheidsstatus". Dit is 'n baie interessante bron van inligting wat voortdurend opgedateer word.
- g. In die South African Journal of Botany 68 (2013) is daar 'n artikel deur VI Williams, JE Victor, en NR Crouch met die gepaste titel: "Red listed medicinal plants of South Africa: Status, trends, and assessment challenges"

Die fassinerende artikel rapporteer omvattend oor die gebruik en rol van plante in die tradisionele medisyne mark met interessante statistieke. Daar was toe alreeds beraam dat die praktyk meer as 70,000 ton plantmateriaal per jaar in Suid-Afrika behels met ongeveer 134 000 inkomstegenererende geleenthede. (persone afhanklik van of betrokke in die bedryf as inkomsteverdieners) Indien daar konserwatief bereken word dat elke werker in die bedryf verantwoordelik is vir die versorging van ongeveer 7 siele is ten minste 1 miljoen mense dus afhanklik van die praktyk vir hulle bestaan.

Volgens die artikel is die IUCN (The International Union for Conservation of Nature) se rooilysstelsel 'n uitstekende instrument om die taksa wat onder kort en mediumtermyn bedreiging staan te identifiseer.

Die artikel maak die gevolgtrekking dat 2,6 persent, dus ongeveer luit 38, van plante wat in hierdie groep val, dus ongeveer 0,35% van die totale inheemse bevolking van Suid-Afrikaanse flora, uitwissing in die gesig staar vanweë die oes vir medisinale gebruik.

Die getal spesies wat ernstige bedreiging in gesig staar en onmiddellike aandag vereis volgens die publikasie, tel ongeveer 170.

Weereens, in die betrokke artikel, word nie onderskei tussen plante met boomstatus en die daarsonder nie.

As die met boomstatus uitgesoek word, (boomstatus volgens die Saklys), dan tel die boomspesies wat *onmiddellike bedreiging* in die gesig staar ongeveer 40. Vir die doel van hierdie skrywe is broodbome (*Encephalartos* spesies) en aalwyne (*Aloe / Aloidendron*) met boomstatus uitgelaat. Die lys is nie volledig nie en selektief uit die publikasie net op skere plante wat boomstatus geniet gefokus, met die uitsluitlike doel om dit vir die boomkyker moontlik te maak om die belangrikste boomspesies wat vir medisinale gebruike benut word en daardeur onder bedreiging staan, te kan uitken.

Hierdie lys oorvleuel met die lys geneem uit van Wyk et al maar bevat ook 'n hele aantal spesies wat nie in die vorige lys voorkom nie. Hierdie lys konsentreer meer op die boomspesies wat bedreiging in die gesig staar en fokus ook meer op skaarser, gelokaliseerde en dus meer onbekende bome.

Die spesies in die tabel hieronder gelys val onder die meer bedreigde spesies volgens bogenoemde publikasie.

Botaniese naam	Gewone naam
<i>Brackenridgea zanguebarica</i>	valslekkerbreek
<i>Synaptolepis oliveriana</i>	klimveselbos
<i>Widdringtonia wallichii</i>	clanwilliamseder
<i>Acridocarpus natalitius</i> var. <i>linearifolius</i>	smalblaarmotvrug
<i>Albizia suluensis</i>	zuluvalsdoring
<i>Adenia gummifera</i>	groenstam
<i>Cassipourea flanaganii</i>	Kaapse uiehout
<i>Balanites maughamii</i> subsp. <i>maughamii</i>	groendoring
<i>Leucospermum conocarpodendron</i> subsp. <i>viridum</i>	groenkreupelhout
<i>Cassipourea malosana</i>	uiehout
<i>Mondia whitei</i>	gemmerklimop
<i>Cryptocarya latifolia</i>	breëblaarkweper
<i>Ocotea bullata</i>	stinkhout
<i>Cryptocarya transvaalensis</i>	wildekweper
<i>Warburgia salutaris</i>	peperbasboom
<i>Elaeodendron croceum</i>	gewone saffraan
<i>Cassipourea gummiflua</i> var. <i>verticillata</i>	grootblaaruehout
<i>Ilex mitis</i> var. <i>mitis</i>	without
<i>Cryptocarya myrtifolia</i>	mirtekweper
<i>Loxostylis alata</i>	teerhout
<i>Leucadendron procerum</i>	langbeentjie
<i>Newtonia hildebrandtii</i> var. <i>hildebrandtii</i>	lebombowattel
<i>Ocotea kenyanensis</i>	noordelike stinkhout
<i>Pterocelastrus rostratus</i>	rooikershout
<i>Prunus africana</i>	rooistinkhout
<i>Rapanea melanophloeos</i>	Kaapse boekenhout

Botaniese naam	Gewone naam
<i>Crassula arborescens subsp. undulatifolia</i>	kartelplakkiesbos
<i>Euphorbia sekukuniensis</i>	sekhukunenaboom
<i>Umtiza listeriana</i>	umtiza
<i>Faurea macnaughtonii</i>	terblans
<i>Adenia fruticosa subsp. simplicifolia</i>	kleingifklimop
<i>Greyia flanaganii</i>	keibaakhout
<i>Alberta magna</i>	breekhout
<i>Vitellariopsis dispar</i>	tugelabosmelkhout
<i>Combretum mkuzense</i>	maputalandboswilg
<i>Curtisia dentata</i>	assegaai
<i>Elaeodendron transvaalense</i>	bosveldsaffraan
<i>Erythrophleum lasianthum</i>	maputalandoordeelboom

Die getal spesies met die besondere status om te resorteer as "boom", sowel as op die rooilys te wees, (dus dringende aandag benodig), sowel as om vir medisinale gebruik benut te word, en nie 'n broodboom of aalwyn is nie, tel dus ten minste 40.

Die groep verander natuurlik in getal en status van jaar tot jaar en verskil ook van publikasie tot publikasie. Die syfers en name kan dus nie as 100% akkuraat beskou word nie maar gee tog 'n redelik goeie algemene indruk van die aard en omvang van die probleem..

AFLEIDINGS:

Met die bogenoemde verwysings kan die volgende afleidings gemaak word om 'n benadering deur die boomliefhebber tot die praktyk en probleem te help vorm:

- Die gebruik van wortels, bas, vrugte en alle ander gedeeltes van sekere inheemse bome vir tradisionele medisyne, deur lede van alle bevolkingsgroepe kom wydverspreid en algemeen voor en hou 'n

daadwerklike bedreiging vir die voortbestaan van sekere spesies in.

Daar word geraam dat tot 70% van die Suid-Afrikaanse bevolking van tradisionele medisyne gebruik maak.

- Besoeke aan markte wat tradisionele medisyne bemark wys ontseggelik op die massiewe gebruik en impak daarvan.



Die muthi mark van Warwick, Durban soos geadverteer in toerismebrosjures as gewilde toerismebestemming in Durban. Fotos verkry van die internet, toerismebestemmings.



Die impak op geaffekteerde spesies gaan eerder toeneem as afneem. Die "oes" van produkte is voorheen hoofsaaklik deur landelike tradisionele genesers in hulle plaaslike gebiede gedoen. Waar daar by hulle dus 'n ekonomiese belang sou wees om dit op 'n volhoubare manier te doen, het verstedeliking en die ontwikkeling van markte die daarstelling van middelmannen tot gevolg. By laasgenoemde is daar uit die aard van die saak minder van 'n aansporing tot die volhoubare "oes" van die produkte, met die onafwendbare gevolg van verergering van die bedreiging tot uitwissing van spesies.

Daar is werklik wetenskaplike bewyse dat baie van die tradisionele produkte eienskappe het wat baie ooreenstem met allopatiese produkte en dus werklike genesingseienskappe besit. Allopatiese produkte egter is meesal beter geselekteer, ontwikkel, verfyn en dosisgewys baie beter voorspelbaar in effek.

Baie, indien nie die meeste allopatiese produkte kom buitendien vanuit die plantbevolking oorspronklik.

Van die spesies wat benut word, is talryk en kom wydverspreid voor en die benutting daarvan hou nie 'n bedreiging vir die voortbestaan daarvan in nie. Ander spesies ongelukkig is laag in getalrykte, of kom in digbevolkte areas voor, of is baie gelokaliseerd in stand, wat daardie spesies dus baie meer bedreig maak.

Sommige spesies is ook onder druk vanweë benutting deur mens en dier. Die vermoë van spesies om benutting deur byvoorbeeld die stroop van bas te weerstaan verskil ook onderling. Sekere spesies kan geredelik wonde genees maar sekeres is baie kwesbaar met min weerstand teen die indringing van swamme of bakterieë vanweë ontbassing. Dieselfde geld vir die oes van wortels.

Daar is waarskynlik nog baie onontdekte produkte wat verlore mag gaan indien toegelaat word dat spesies vanweë oorbenutting, onoordeelkundige benutting of verlies van habitat verdwyn.

Die probleem is dus omvangryk en behels alle aspekte van ekologie. Daar kan dus ongelukkig nie 'n enkele "one fit for all" benadering tot die probleem gevolg word nie en elke spesie ter sprake moet individueel ondersoek en aangespreek word.

Wat kan gedoen word en wat word reeds gedoen om die probleem aan te spreek.:

Seker die heel belangrikste is opvoeding.

Opvoeding van die algemene publiek van alle bevolkingsgroepe om hulle bewus te maak van die omvang van die probleem asook dat daar waarskynlik dikwels beter allopatiese produkte is om siektes en skete mee te behandel. Opvoeding van tradisionele genesers om hulle bewus te maak van die omvang van die probleem, asook dat hulle volhoubare praktyke sal moet volg om hulle bedryf volhoubaar te maak.

Opvoeding van die publiek en veral boomliefhebbers om op die uitkyk te wees vir areas van bedreiging en stroopaktiwiteite en derhalwe maatreëls om die bedreiging die hoof te bied te kan ontwikkel.

Identifisering en bewaring van areas en spesies wat onder bedreiging staan, beide ten opsigte van individuele spesies, areas en habitate.

Uitbreiding van bewaringsareas, beide openbaar en privaat en doeltreffende polisiëring en monitering daarvan.

Kweking en verspreiding en hulp met aanplanting van bedreigde spesies deur openbare en privaatinstansies. As kontroversiële moontlikheid, kommersiële aanplanting en benutting van die mees bedreigde spesies om aan die behoefte te voldoen en sodoende die druk op die wilde natuurlike bevolking te verminder.

Aanvaarding van die konsep van volhoubare benutting as aansluiting by die vorige punt. Botsing in opinies ten opsigte van bewaring as hoofdoel, volhoubare benutting en kommersialisering as maatreël om bedreigde spesies te probeer beskerm lok altyd warm debatte en sterk opinies uit. Eenstemmigheid tussen belangegroepe sal seker nooit bereik kan word nie.

Gedurende 2024 is daar in Suid-Afrika konsepwetgewing gepubliseer sowel as konferensies gehou met as doel die implementering van die konsep van volhoubare benutting van bio-hulpbronne. Daar was alreeds ernstige botsings tussen bewaringsgroepe enersyds en owerhede en ander belangegroepe andersyds.

Dat die probleem egter groot is en steeds groter word is voor die hand liggend. Dat daar hande gevat sal moet word deur verskillende belangegroepe met verskillende idees is onteenseglik.

Spesifieke Voorbeelde

Voorts sal daar interessantheidshalwe op enkele spesies gefokus word om van die verskillende punte reeds na verwys, te illustreer.



Prunus africana
rooistinkhout / red stinkwood
Familie - ROSACEAE



Prunus is 'n genus van bome en struik in die Rosaceae-familie en sluit in pruime, kersies, perskes, nektariens, appelkose en amandels. Kollektief word na die vrugte van die plante as steenvrugte verwys. Van die ongeveer 200 spesies in die genus *Prunus* wat wêreldwyd voorkom, kom slegs een spesie, naamlik *Prunus africana* in Afrika voor. Die verspreiding in Afrika is gelukkig wyd en strek van die Kameroen en Ethiopië tot in die Tsitsikamawoud. In Suid-Afrika kom dit veral in die misgordel van die Oostelike platorand voor met enkele stande meer wes, onder andere in die Magaliesberg. Ongelukkig is die stande in Suid-Afrika redelik gelokaliseer met kleinerige populasies. Verspreiding geskied deur saad wat deur voëls versprei word. Die verspreiding in Suid-Afrika is uiters beperk met klein stande. Die totale natuurlike populasies in Suid-Afrika word gereken as slegs ongeveer 10 000 bome.

Volgens SANBI se Rooilys van Suid-Afrikaanse plante weergawe 2024, word die rooistinkhout gelys as VU (kwesbaar). CITES (the Convention on International Trade in Endangered Species of Wild Fauna and Flora) klassifiseer *Prunus africana* as "of urgent concern". Veral die bas van die boom word as tradisionele medisyne benut en in meer as die helfte van die lande waar dit voorkom, is die rooistinkhout onder bedreiging. Die tendens is dat die gebruik van *Prunus africana* produkte toeneem. In Natal het rooistinkhout reeds in meer as 50% van die areas waar dit vantevore voorgekom het heeltemal verdwyn en die totale populasie het ook met meer as 50% afgeneem. Die boom se bas is eers op die ouderdom van 15 jaar in die posisie om genoeg van die medies aktiewe bestanddeel te produseer.

Die bas van die rooistinkhout word veral gebruik vir verskillende genito-urinêre probleme maar veral vir benigne prostaathipertrofie (BPH). Dit word onder andere ook vir borskaspyn gebruik. Die aktiewe bestanddeel is 'n sitosterol wat die gewenste effek het om simptome van genito-urinêre aard, onder andere BPH te verlig. Na bewering bevat die bas ook stowwe wat apoptose (selfdood) van prostaatkankerselle kan stimuleer. Daar is tot agt verskillende fitochemiese stowwe uit *Prunus* geïdentifiseer wat 'n rol mag speel in die voorkoming en behandeling van prostaatkanker.

Insiggewend is dat die bas van die boom ook wyd in

Europa gebruik word as "natuurlike" produk teen BPH. Daar word bereken dat die jaarlikse uitvoer van die bas van *Prunus africana* uit Afrika alleen na Europa alreeds tussen 3 200 en 4 900 ton per jaar beloop het, totdat 'n CITES verbod in 2003 daarop geplaas is.

Daar word beweer dat die bekendstelling van *Prunus* boombas as middel teen BPH deur Zoeloemans aan 'n Suid-Afrikaanse dokter bekend gestel is. Vanaf die dokter se bekendstelling het dit in Europa gewildheid bereik as "natuurlike medisyne" vir die bekamping van BPH. Die aktiewe bestanddeel uit die boombas word bemark onder die naam *Pygeum*. Dit toon hoe vër en wyd die gebruik van hierdie tradisionele medisyne produk strek.

Tans word rooistinkhoutbas op groot skaal uit veral Kameroen vir die stygende aanvraag uit Europa geoes en uitgevoer. Plaaslik is die oes gelukkig beperk vir die plaaslike mark.

Daar word bereken dat slegs kommersiële aanplanting op groot skaal sal kan voorsien in die toenemende aanvraag.

Daar is in beide Kameroen en Kenia programme om die oes van die bas op "volhoubare" wyse te organiseer asook om kommersiële aanplanting te vestig. Of dit die weg is om te volg is natuurlik baie omstrede. Reeds in 1913 is die eerste pogings in Kenia aangewend tot kommersiële verbouing.

Dr CJ Geldenhuys het reeds in 1981 'n artikel in die South African Forestry Journal oor die status van *Prunus africana* in byvoorbeeld die Tsitsikamma gepubliseer. Op daardie stadium is slegs ongeveer veertig bome in die Tsitsikamma geïdentifiseer waarvan 47% reeds dood was. Pogings is aangewend om *Prunus* in die Tsitsikamma te hervestig, maar dit het geblyk dat die aanplantings slegs in versteurde grond naby paaie suksesvol was.

Daar is wyd navorsing gedoen en gepubliseer deur verskeie instansies rondom *Prunus* en die studie van hierdie spesie is 'n goeie beginpunt om die hele kwessie van die rol, aspekte rondom tradisionele medisyne, impak op biodiversiteit en moontlike oplossings en antwoorde vir die probleem van bewaring en volhoubaarheid asook opvoeding aan te spreek.

Warburgia salutaris

peperbasboom / pepperbark

Familie - CANNELACEAE

Warburgia salutaris: Boomvoorkoms en blare.

Die peperbasboom is seker een van die mees bedreigde van al die boomspesies hier ter sprake.

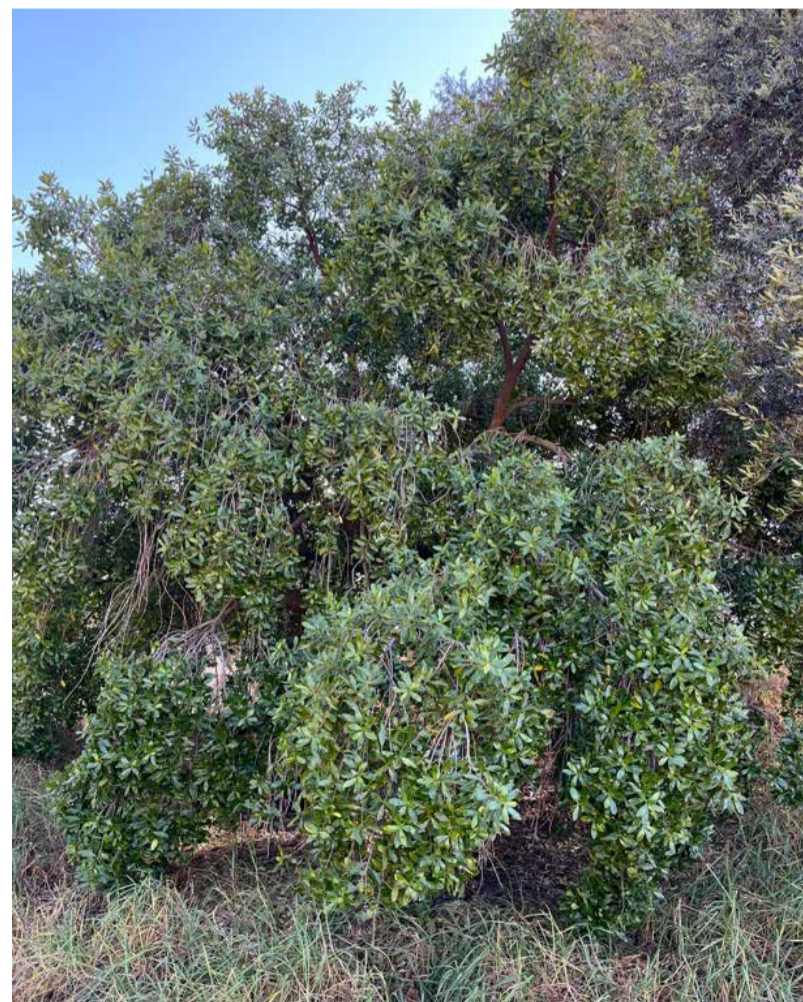
Die bas het 'n peperagtige smaak, vandaar die Afrikaanse en Engelse naam.

Warburgia kom in die oostelike dele van die land voor vanaf die Soutpansberg tot Natal. Habitats strek van bergwoude tot kusstreke. Die spesie is nie endemies tot Suid-Afrika nie maar plaslik erg bedreig.

Dit versprei veral deur middel van saad en kan gelukkig vegetatief ook deur veral uitlopers van omgevalle bome voortplant.

Peperboombas word veral gebruik as hoesmedisyne, en is aktief as ekspektorant, om slym te verdryf. Die aanwending is dus baie algemeen as 'n kuur vir 'n algemene hoesprobleem. Ongelukkig word die bas, sowel as die blare, sowel as die wortels gebruik. Dit maak individuele bome dus baie kwesbaar vir vernietiging in die oes daarvan. Volgens die SANBI Rooilys van Suid-Afrikaanse plante weergawe 2024 word *Warburgia* se status as VU - "kwesbaar" gelys.

Daar word bereken dat die totale natuurlike populasie in Suid-Afrika tans slegs tussen 4 600 en 5 600 individuele bome tel. Peperbas is baie gewild in die tradisionele medisyne mark. In 'n opname gedoen alreeds in



1988 deur Cunningham et al, is gevind dat tot 66% van tradisionele medisyne markte in Johannesburg hierdie produk op rakke aanhou. Tradisionele genesers het toe al bewus geword dat die produk al moeiliker bekombaar raak.

Williams et al het in hul navorsing bevind dat deur die dikte van bas wat beskikbaar by verkooppunte te meet, voorsiening van die produk drasties aan die daal was en dat dit 'n aanduiding is dat al jonger eksimplare van *Warburgia* benut word. Dit het aangedui dat selfs klein boompies of uitlopers in totaliteit ge-oes word. Soos reeds vermeld, word *Warburgia* veral gebruik vir respiratoriese probleme wat baie algemeen voorkom onder die plaaslike bevolking en dat dit die druk op die spesie verder verhoog. Die plant word ook gebruik vir griep, rumatiek, malaria, veneriese siektes, hoofpyn, tandpyn, en maagsere!. Tragies, vir die voortbestaan van die spesie, word dit blykbaar vir alle siektes aangewend!!

Die bas word of gerook of as 'n suspensie in koue water voorberei, ingeneem.

Warburgia het skynbaar reeds uitgesterf in Zimbabwe en is onder erge bedreiging ook in Eswatini en Mosambiek. Dit is ook reeds total uitgewis in sekere gebiede in Kwazulu-Natal waar dit voorheen algemeen voorgekom het.

Warburgia is ongelukkig ook baie kwesbaar vir die indringing van swamme en bakterieë waar die bas gestroop is, wat lei tot vroeë vrektes. Die plante het dus 'n lae toleransie vir die verdra van die stroop van die bas. Gelukkig groei en versprei dit maklik van uitlopers en kan dit derhalwe vermeerder.

Tans is daar verskeie projekte in die land aan die gang om die voortbestaan van die boom te probeer verseker. Een projek is om verbruikers en gebruikers te leer dat die blare dieselfde medisinale bestanddele bevat as die bas en deur opvoeding, rolspelers te oorreed om eerder blare as bas te gebruik ten einde die boom teen uitwissing te beskerm.

Tradisionele gemeenskappe word ook geleer om *Warburgia* eerder by hulle huise aan te plant en blare te benut eerder as om die bas van wilde eksimplare te stroop. *Warburgia* kan ook as heining aangeplant word. In die Soutpansberg is daar 'n area gevind waar dit blyk dat 'n voormalige bevolking *Warburgia* juis vir hierdie doel aangeplant het.

Tussen 1980 en 2011 was daar 'n projek tesame met die botaniese afdeling van die Kruger Nasionale Park waartydens 20 000 boompies aan tradisionele genesers in die omgewing verskaf is en hulle aangemoedig is om die boompies te laat groei en volhoubaar te benut ten einde die druk op die natuurlike bevolking te verlig. Dit het wel gelei tot 'n afname in die tempo van vermindering van die natuurlike bevolking.

Meer onlangs het SAPPI se "Forestry Research Centre" ook in samewerking met ander instansies 'n projek geloods om tot 60 000 klein boompies te kweek en beskikbaar te stel aan belangegroepes in die bedryf in Suid-Afrika. Weer die kontroversiële aspekte en konflikte tussen praktyke wat fokus op bewaring, volhoubare benutting en kommersialisering, of 'n kombinasie van al drie.

Warburgia is 'n baie aantreklike immergroen boom wat al meer in tuine en voorstedelike parke en op sypaadjies aangeplant word. Dit is interessant om waar te neem hoe die bas op plekke waar *Warburgia* op sypaadjies aangeplant is, ge-oes word. Van 'n laning van 23 bome langs 'n pad in 'n voorstad van Pretoria ton 13 eksimplare tekens van erge basskade en een boom is klaar dood. Aanplantings van sulke aard kan dus ook help om druk op die natuurlike bevolking te verminder.



Voorbeelde van wonde aan aangeplante *Warburgia salutaris* eksimplare in voorstedelike gebiede afkomstig van die stroop van bas. Let op die foto aan die linkerkant waar die betrokke eksimplaar nie die ontbassing oorleef het nie. Hopelik nie die vooruitsig van die ander bome in die agtergrond nie.



Adansonia digitata
kremetart / baobab
Familie: MALVACEAE

Daar kan nie 'n relaas oor die onderwerp wees sonder om die ikoniese kremetart aan te spreek nie, nie net vanweë sy majesteuse voorkoms nie, maar ook as gevolg van die legio voordelige eienskappe en gebruike vir mense, diere, voëls en feitlik alle ander lewende organismes in sy omgewing. Benewens al die voordele soos voeding, skuiling en vele ander het die kremetart ook genesende eienskappe en speel 'n belangrike rol in die tradisionele medisyne mark. Tesame met die medisinale gebruike skep die kremetart ook 'n mistieke bonatuurlike atmosfeer wat mense van alle kulture aanraak. Hierdie mistieke kulturele verbintenis dra by tot die medisinale gebruike en gelowe wat altyd met die gebruik van medisinale produkte gepaard gaan.

Soos algemeen bekend, kom die kremetart in die noordelike droër streke van Suid-Afrika voor. Hoewel dit in die SANBI Rooilys van Suid-Afrikaanse plante weergawe 2024 gelys word as LC - *least concern* en volgens 'n onlangse opname is die spesie tans nie onder bedreiging nie

SANBI stel egter dat toenemende benutting en klimaatsverandering die huidige status in die nabye toekoms negatief kan verander. Volgens enige natuur liefhebber en boomkenner wat gereeld die Kruger Nasional Park (KNP) en omliggende streke besoek se intuietiewe waarneming is die teenoorgestelde egter heersend. Die heersende algemene indruk is dat die bome binne parke erg deurloop onder olifante en die bome buite parke onder mense. Gelukkig is die kremetart se vermoë om te genees van basbeskadiging relatief sterk in vergelyking met ander spesies.

Die gebruike van die kremetart is legio en daar sal dus net na die medisinale gebruik en waarde hier verwys word. Tradisionele genesers berei 'n konkoksie van die vrugpulp voor en behandel daarmee koors, diaree en



hemoptise (hoes van bloed). Die blare en bas word gebruik in die behandeling van urinêre probleme en diaree. Verpoederde sade word gebruik teen hik. Die blare word vir verskeie velprobleme, oormatige sweet en oormatig olierige vel gebruik.

Die bas word selfs in Europa bemark en gebruik as 'n koorswerende middel. In seker dele van Afrika word die bas as middel teen malaria gebruik.

Die medisinale waarde as anti-inflammatoriese en koorswerende middel berus waarskynlik op die teenwoordigheid van quertien, 'n bekende anti-oksidadant.



Vier kremetartbome. Almal binne 5 kilometer van mekaar in 'n dig bevolkte gebied naby Hoedspruit. Let op die skade aan die bas van die boonste twee bome en kyk na die maatreëls wat getref is om die onderste twee voorbeelde te probeer beskerm

Brackenridgea zanguebarica
valslekkerbreek / yellow false-plane
Familie - OCHNACEAE

'n Paar feite omtrent hierdie redelik onbekende spesie van die Rooihout familiegroep is fassinerend insoverre dit ons belangstelling in hierdie verband behels.

Hierdie kleinerige boom kom in Suid-Afrika slegs in een enkele area in die Thengwe distrik in die Vhembe area in die toenmalige Venda voor. Die spesie word geklassifiseer as krities bedreigd ("critically endangered"). Die bedreiging en afname in die populasie is amper uitsluitlik vanweë die oes vir die tradisionele medisyne mark. Daar was wel ook 'n aantal eksemplare vernietig deur 'n padbouprojek.

Daar word bereken dat daar 'n afname van 86 persent van die Suid-Afrikaanse eksemplare gedurende die negentigerjare van die vorige eeu plaasgevind het. Die huidige populasie in Suid-Afrika tel moontlik nie meer as 400 bome nie.

Die bas en wortels word benut as medisyne en dit word in die Limpopo provinsie as die mees gesogte tradisionele medisynevorm beskou. Die bas en wortels word benut.

Na bewering het niemand nog daarin geslaag om die spesie kunsmatig of deur saad of enige ander manier te propageer nie. Die plant kan blykbaar slegs op sy eie in sy natuurlike omgewing voortplant. Die rede daarvoor is waarskynlik dat 'n tot nog toe ongeïdentifiseerde parasiet se teenwoordigheid waarskynlik nodig is vir ontkieming.

Die bas en wortels word gebruik vir onder andere behandeling van wonde, ontworming, amenoree, geswolle enkels en pynlike hande.

Wetenskaplike ondersoek het bevind dat produkte van die spesie biologiese aktiwiteit teen sekere eukariotiese selle sowel as virusse en bakterieë toon. Daar is dus potensiële antibiotiese aktiwiteit teen sekere parasietvorme, bakterieë, sowel as virusse!!

Die groot waarde van die plant lê blykbaar egter in sy towerkrag.. Dit kan mens glo beskerm teen nadelige toorkragte maar ook kan die gebruiker bevoordeel in sportkompetisies aangesien dit aangewend kan word om die opponent te benadeel! Dit kan 'n hele huishouding beskerm teen bose mense, so word geglo!

Sover dit die oes van die plant aanbetref is daar rituele wat die bome tot 'n mate beskerm. Dit mag slegs deur



aangewese tradisionele genesers (dus nie enige een nie), op 'n donker nag en in 'n naakte toestand ge-oes word.

Nie-toegewysde persone wat die plante of plantprodukte hanteer sal blykbaar steriel word. Geen vrou mag naby die plantprodukte kom nie. Iemand wat nie 'n tradisionele heler is, of 'n aangewese persoon om die oeswerk te doen nie en van die produkte oes, sal vroeg te sterwe kom. (voor die ouderdom van 50) 'n Bestuurder van 'n stootskrapeer wat aan 'n padbouprojek in die omgewing gewerk het en van die boompies beskadig het, is glo onverwags kort daarna oorlede.

Daar is 'n klein slegs een vierkante kilometer reservaat gevestig om die boompies te probeer beskerm en die plaaslike gemeenskapsowerhede probeer ook om 'n volhoubare benuttingsprogram te vestig, oes te reguleer en so die voortbestaan te probeer verseker. Die plaaslike Vhatavhatsindi stam beskou hulleself as die beskermhere van die populasie en poog om die spesie te bewaar vir die plaaslike gemeenskap. Die reservaat heet die Mutavhatsindi reservaat wat ook die Vendanaam vir die valslekkerbreek is. Was dit nie weens die kulturele verwantskap tussen die plaaslike stam en die spesie nie was hierdie besondere plant waarskynlik ook al uitgeroei in Suid-Afrika. Vir verdere inligting omtrent hierdie besondere boom word die leser veral na publikasies op die SANBI webspasie verwys.

Tradisionele en kulturele gelowe en beskouings kan dus nog 'n vorm van bewaring tot gevolg hê wat 'n rol mag speel in die oorlewing van 'n spesie.



Brackenridgea zanguebarica. Let op die tipiese blaarpatroon van die rooihoutfamilie asook die kenmerkende geel kleur van die onderbas- vandaar die Engelse naam "yellow peeling plane" en alternatiewe Afrikaanse volksnaam; geellekkerbreek. (Fotos van valslekkerbreek met dank en erkenning verkry van John Burrows)

SLOTSOM

Dat die gebruik en misbruik van boomprodukte in die tradisionele medisyne

praktik, asook die toename daarvan 'n bedreiging vir spesie-diversiteit in Suid-Afrika inhou staan soos 'n paal bo water. Dat die probleem drastiese en dringende aandag benodig is voor die hand liggend. Dat daar onteenseglik medisinale waarde in baie van ons boomspesies is, is ook waar.

In die tradisionele gebruik van plantmateriaal is daar beslis ook medisinale waarde en baie wetenskaplike navorsing moet nog gedoen word om die werklike waarde te verreken. Daar is verseker ook nog deur die wetenskap baie onontdekte medisinale waarde opgesluit in eeue-oue tradisionele medisinale praktyke sowel as boerate wat nog ontdek sal kan word as die planteryk bewaar kan word.

Ook vanuit 'n kulturele oogpunt is die bewaring van tradisionele en inheemse kennis oor bome en die gebruik daarvan kosbaar. Daar word gelukkig reeds baie aandag aan die onderwerp spandeer. Daar word baie navorsing gedoen en gepubliseer maar ongelukkig nie genoeg en ook nie vining genoeg nie.

Die algemene publiek benodig baie inligting, mobilisasie en gepaardgaande opvoeding in die verband. Alle belangegroepe stem waarskynlik saam dat die probleem bestaan, maar verskil ongelukkig erg oor hoe dit aangespreek moet word in terme van bewaring, kommersialisering en die konsep van volhoubare benutting.

Gedurende 2024 is die Konsepwysigingswet op Nasionale Omgewingsbestuur: Biodiversiteitswet 2024 (algemeen bekend as NEM:BA) in die staatskoerant gepubliseer. Dit het gepaard gegaan met 'n groot konferensie deur die owerheid gereël met as doelwit onder andere "volhoubare benutting van natuurlike hulpbronne" ook die in nasionale parke. Dit sluit natuurlik inheemse bome en die gebruik daarvan in. Sommige belangegroepe ervaar dit as positief maar ander sien dit as 'n bedreiging tot die bewaring van die nasionale boomerfenis.

Ook onder die bewaringsgesindes word daar verskil. Sommiges wil ons, (die mens) se erfenis bewaar, terwyl ander dit eerder sien as nie-behorende aan "ons" nie, maar biodiversiteit sien as biodiversiteit op sy eie, nie behorende aan die mens nie en die bewaring van biodiversiteit as 'n mikpunt op sy eie. Hierdie punt raak aan die filosofiese dissiplines en is nie die fokus van hierdie skrywe nie.

Gelukkig stem almal saam dat iets gedoen moet word, maar oor hoe, wie, wat en waar is daar nog nie eenstemmigheid nie. Die debat sal nog lank duur en hoe vinniger almal gestimuleer en opgevoed kan word en begin deelneem aan die proses vir die bewaring van ons geliefde bome op watter manier ook al hoe beter. Vir enigiemand wat meer wil weet oor die onderwerp en betrokke wil raak is daar vele verwysings in die bronnelys. Die bronverwysings dien ook as bronne vir verdere verwysings wat nie hier vermeld word nie vanweë gebrek aan spasie.

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Soetanysberg

Dr Francois du Randt

Die Kapenaars sal sekerlik nie met my saamstem nie, as ek sê dat daar net vier goeie dinge in die Wes-Kaap is, naamlik die Fynbos en Proteaceae, die fotogeniese plooiberge, die rooiwyn, en natuurlik die pad terug na Zoeloeland! Natuurlik het die Wes- en Suid-Kaap 'n baie sagteplekkie in my hart (so moenie te sleg voel nie), en ek gaan juis poog om 'n stukkie van my liefde hier te deel – dit is nie 'n dendrologiese skat nie, maar hierdie bedreigde fynbos, is uitnemendheid!

Om by Soetanysberg uit te kom, moet 'n mens eers by Kaap Agulhas uitkom, en hierdie teerpad loop deur Struisbaai. Die baie blootgestelde, oop, boomlose Struisbaai se munisipale kampeerterrein, so ook die L'Agulhas kampeerterrein, is nie wonderlike opsies vir akkommodasie nie, maar dit is ongelooflik hoe die Here kan voorsien in wonderlike, begrotings-gepaste, chalet akkommodasie met 'n 180° uitsig oor die rowwe see, as 'n mens dit nodig het. Dit is die nat wintermaande en 'n heerlike kaggel met rooiwyn, of 'n sjerrietjie, is nie te versmaai nie. Hoekom gaan ek in die koue en nat maande na die Wes-Kaap? ... die mooiste blomme, blom daardie tyd van die jaar, regdeur na die Lente!

Die naam L'Agulhas kom vanaf die Portugese woord, wat beteken "needles", verwysende na die kompasnaald wat suid wys. Die Portugese het die plek gedoop Cabodos Agulhas, "Cape of Needles". Die Franse woord is Le Aiguilles. Ek skat dit is die herkoms van die "L" in L'Agulhas. Die ligting is gebou in 1849 en is die tweede oudste, werkende ligting in Suid-Afrika. Tussen Agulhas en Suiderstrand is 'n skeepswrak, genaamd Meisho Maru, wat hier gestrand het op 16 November 1982.

My groot vriend vanaf KwaZulu-Natal se Suidkus dae, Geoff Nichols, bly in Suiderstrand. Gou-gou spoor ek hom op, want hy is 'n lopende plant ensiklopedie op sy eie, en gou-gou drink ons koffie saam en besluit op plant ekskursies. Geoff is so vriendelik soos altyd, en hy vertel ons oor die kriminele elemente in die Suidkus, wie hulle effektief daar weg gedryf het. Hulle bly nou reeds 18 maande in Suiderstrand (Augustus 2022) en hy geniet homself gate uit tussen die 'nuwe' plante. Geoff is klaar 'n 'boffin' in die area en vertel ons dat daar meer as 70 spesies plante is, net tussen Suiderstrand en Agulhas. Dit is eintlik ongelooflik. Hy leer ál die plaaslike inwoners van hulle eie ryk en waardevolle plantskatte. Ons besluit dus op 'n dag uitstappie na Soetanysberg, maar natuurlik het die reën altyd 'n finale sê, en maak dit ons uitstappie effe korter, maar met "gum boots"



Die outeur fotografeer pragtige fynbos (Foto: Geoff Nichols)

en al, takel ons hierdie 'berg', as jy dit 'n berg kan noem. Ons begin ons uitstappie by Rhenosterkop, op die eertydse plaas, Brandfontein, wat nou deel is van Agulhas Nasionale Park. Wat maak Soetanysberg so spesiaal?

Kom ons kyk eers kortliks na die geologie van die Kaapse plooiberge. Dit behoort aan die Kaap Supergroep van Kaap-Natal-Msikaba Sandsteen, min of meer 500 miljoen jaar in ouderdom. Hierdie kwartsiet sandsteen en skalie lae kan vanaf die boonste lae tot onder verdeel word in die:

- Witteberg Groep
- Bokkeveld skalies
- Tafelberg Sandsteen Groep, en
- Kaapse basis graniet, soos wat ons sien by Paarlberg en Seepunt se strand.

Die Tafelberg Sandsteen Groep ("Cape Peninsula Sandstone") word verdeel (van bo na onder) in:

- Nardouw Sandsteen
- Sederberg Sandsteen
- Skiereiland (Tafelberg) Sandsteen
- Graafwater Sedimente
- Malmesbury Graniet

Hierdie is alles sandsteen. Dit is die belangrikste bestanddeel van die Kaapse plooiberge. Dit is die basis waarop die Kaapse fynbos groei (wat ek hieronder in Engels klassifiseer), en die fynbos plante is absoluut afhanklik van hulle geologiese substraat. Maar suid van die plooiberge, tussen Stanford-Gansbaai en Mosselbaai, lê groot vlaktes wat bestaan uit kalksteen, neergelê vanuit die oseaan en die eertydse 'Agulhas-see'. Hierdie feit alleen, maak fynbos 'n wonder natuurprag. Die Agulhas-see se sedimente is natuurlik baie jonger in geologiese jare en is later neergelê, selfs bo-op die sandsteen!

So wat maak Soetanysberg so spesiaal?

Die basis van Soetanysberg is **sandsteen**, met suurgrond sand fynbos, en die top van die berg is **kalksteen**, wat alkalies is. Hier bo groei net kalksteen fynbos! Agulhas kalksteen. Hierdie geologiese verandering maak die fynbos 'n groot avontuur. Ons sien dieselfde kenmerk op die eerste stapdag van die Walvis Voetslaanpad, maar dan stap jy eers oor suur sandsteen (Potberg), voordat jy die De Hoop kalksteen fynbos nader, presies die omgekeerde.



Soetanysberg

Die Fynbos bioom word opgedeel in biografiese streke en in kleiner sub-eenhede, maar ek noem net die hoofgroeperinge (in Engels), as volg:

- Sandstone Fynbos (FFs)
- Quartzite Fynbos (FFq)
- Sand Fynbos (FFd)
- Shale Fynbos (FFh)
- Shale Band Fynbos (FFb)
- Conglomerate Fynbos (FFT)
- Alluvium Fynbos (FFa)
- Granite Fynbos (FFg)
- Silcrete Fynbos (FFc)
- Ferricrete Fynbos (FFf)
- Limestone Fynbos (FFl)
- Shale Renosterveld (FRs)
- Granite Renosterveld (FRg)
- Dolerite Renosterveld (FRd)
- Alluvium Renosterveld (FRa)
- Silcrete Renosterveld (FRc)
- Limestone Renosterveld (FRl)
- Western Strandveld (FS)

Kalksteen fynbos ("Limestone Fynbos") is 'n endemiese streek tussen Stanford en Mosselbaai in die Overberg area. Dit bestaan hoofsaaklik uit kalksteen riuwe en koppies, en word geskei vanaf die Indiese Oseaan deur Duine Ruytes ("Dune Thicket"). Dit beslaan 'n area van 1 908 km² (of 190 836 ha).

Kalksteen fynbos word onderverdeel in drie verskillende tipes, met gapings tussen die tipes by Bredasdorp en Witsand (of Breederiviermond):

- Agulhas Kalksteen Fynbos
- De Hoop Kalksteen Fynbos
- Canca Kalksteen Fynbos



Sand Fynbos met *Tetaria thermalis*, wat amper lyk soos palmiet

Tussen die kalksteen riuwe kry ons diep neutrale sand, geassosieerd met Albertinia Sand Fynbos. Sonder om te veel in te gaan in die baie unieke kenmerke van kalksteen formasies, kan ek net noem dat die Proteaceae en fynbos elemente absoluut endemies is in hierdie streek. Baie belangrik is die feit dat die grond alkalies is, met 'n pH > 7. Die neutrale sand, langs die kalksteen, se pH = 7, terwyl die suur sandsteen se pH < 7 is. Floristies-gesproke kry ons byvoorbeeld suster spesies, spesifiek aangepas by die pH van die sand:

Genera	Kalksteen	Neutrale sand	Suur sand
<i>Protea</i>	<i>P. obtusifolia</i>	<i>P. susannae</i>	<i>P. compacta</i>
<i>Leucadendron</i>	<i>Lc. meridianum</i>	<i>Lc. coniferum</i>	<i>Lc. eucalyptifolium</i>
		<i>Lc. galpinii</i>	<i>Lc. xanthoconus</i>
<i>Leucospermum</i>	<i>Ls. truncatum</i>	<i>Ls. praecox</i>	<i>Ls. fulgens</i>
	<i>Ls. patersonii</i>		<i>Ls. cordifolium</i>



Protea lanceolata, endemies op kalksteen



Protea compacta



Leucadendron meridianum groei net op kalksteen



Protea obtusifolia groei net op kalksteen



Die pragtige, bedreigde *Mimetes saxatilis*, by Struisbaai

Die Suid-Kaapse ruigtes sluit in bome, soos *Sideroxylon inerme* (witmelkhou). *Protea lanceolata* is dominant in natter kalksteen areas. *Mimetes saxatilis* is die kalksteen *Mimetes* en is onder geweldige druk weens menslike oorpulasie en ontwikkeling. Nog 'n prominente tolbos in die droeër kalksteen areas, is *Leucadendron muiirii*.

Ek noem hierdie kort opsomming om te verstaan dat die plante spesifiek aangepas is by die sand substraat waarop hulle groei. Rondom Soetanysberg kry ons pragtige voorbeelde van Agulhas Kalksteen Fynbos, soos *Mimetes saxatilis*, *Leucospermum patersonii*, *Protea obtusifolia*, *Leucadendron linifolium*, *Adenandra obtusata* en verskeie *Erica* spesies.

Op die Elim vlaktes se kleigrond kry ons weer plantspesies, soos *Protea pudens* en *Leucadendron elimense* subsp. *elimense*.



Protea pudens op kleigrond van die Elim vlaktes



Leucadendron elimense subsp. *elimense*



Leucospermum patersonii, op kalksteen

Die verskille tussen *Leucospermum patersonii* en *Leucospermum cordifolium*, behalwe die sand substraat (kalksteen versus suur sand), is dat eersgenoemde se blare baie rooi kartelpunte (3-7) vertoon, dat die blomme se stempels soos 'n perdehoef geknop is, en dat dit groot struik plante is met dik stamme. Die blomme word op reguit stingels gedra.

Leucospermum cordifolium, daarenteen, se blare varieër, met die meeste basale blare met 3 of meer punte, terwyl die boonste blare min punte het. Die stempels is nie geknop nie, en die struik is beslis kleiner en vertoon meer valer. Die blomme word ook lateraal gedra op blomstingels.



Leucospermum cordifolium op suur sandsteen



Geoff Nichols loop deur vleiland oppad na Soetanysberg

Ons stappie begin deur 'n vleiland, daarna op 'n rowwe 4x4 spoor en stekelrige suursand fynbos (wat sy naam absoluut gestand doen) oor 12 kilometer tot bo-op die kalksteen kruin van Soetanysberg. Plek-plek is dit bra rowwe "bundu-bashing" (soos ek dit noem) met hande-viervoet geklouter teen die



Sandsteen Fynbos, oppad na Soetanysberg

gladde kalksteenrotse. Die afklim is nog erger teen seepgladde gras en restio-hange. Ons kan darem bo-op die kalksteen klippe sit om 'n bietjie versnapperings te nuttig terwyl ons die uitsig bewonder, en reflekteer oor wat ons om ons sien.



Amphithalea virgata op die suur sandsteen

Die naam 'soetanys' kom in alle waarskynlikheid vanaf *Agathosma cerefolium*, 'n kalksteen spesie in hierdie area. Die volksnaam van *Agathosma cerefolium* is anysboegoe. Dit behoort aan die Rutaceae familie, wat gekenmerk word deur aromatiese geure. *Agathosma cerefolium* word beskryf met 'n "aniseed fragrance", sekerlik vertaal as soetanys geur.

Ons sien 'n lang lys plante, en ek noem nie eers alles op nie: *Eriocephalus racemosus*, *Lachenalia bulbifera*, *Anemone vesicatoria* (ou naam: *Knoltonia vesicatoria*), *Agathosma collina*, *Pelargonium betulinum*, *Gnidia linearifolia*, *Elegia microcarpa* (kort plant), *Elegia tectorum* (heelwat langer dekriet), *Cassine peragua* subsp. *barbara*, *Strumaria spiralis* (op sandsteen), die interessante verskille tussen *Searsia lucida* en *Searsia laevigata*, *Limonium kraussianum*, *Erica colorans*, *Leucadendron meridianum*, *Leucadendron linifolium*, *Berzelia lanugosa*, *Edmondia sesamoides*, *Saltera sarcocolla* en *Colpoon speciosum* [sinoniem: *Osyris speciosa*].



Agathosma serpyllacea



Erica colorans



Erica filipendula



Die uitsonderlike *Erica ampullacea* op kalksteen (Foto: Geoff Nichols)



Erica corifolia



Erica fascicularis



Erica vestita



Searsia laevigata
(Foto: Geoff Nichols)



Searsia lucida

Searsia laevigata (blouvrugtaaibos) kom net voor in die Suid Kaap, op duine en meestal kalksteen. Dit is 'n meer kruipende struik, met blink obovaat blare (blinker as by *Searsia lucida*) en prominente bearing. Die blaar apeks is rond met 'n skerp punt. Pansies ("galls") is dikwels teenwoordig.

Searsia lucida (blinktaaibos) is 'n regop struik, en sy nuwe jong blare is dikwels rooikleurig. Die blare is lepelvormig, bedek met 'n blink hars, en 'n effe gevlerkte petiole. As jy die blaar lamina vryf, word dit melkerig.

Daar is 3 laterale are per sentimeter. Die takke is meer horisontaal vertak.

Vervolgens sien ons ook die rankplante van *Leucospermum hypophyllocarpodendron* subsp. *hypophyllocarpodendron*, *Leucospermum pedunculatum*, *Leucospermum prostratum* en natuurlik 'n kruising tussen *Leucospermum hypophyllocarpodendron* subsp. *hypophyllocarpodendron* en *Leucospermum pedunculatum*, die sogenaamde "white-snakestem pincushion".



Leucospermum hypophyllocarpodendron subsp. *hypophyllocarpodendron*
(green-snakestem pincushion)



Leucospermum pedunculatum
(white-trailing pincushion)



Spatalla squamata kom slegs voor op sandsteen van die Agulhas-vlakte

Ons sien *Penaea mucronata*, *Helichrysum crispum*, *Metalasia erubescens*, *Gnidia pinifolia*, *Amphithalea speciosa*, *Spatalla squamata* ('n lid van die Proteaceae familie), *Staavia radiata*, *Gnidia oppositifolia*, *Achyranthemum mucronatum* (sinoniem: *Helichrysum chlorochrysum*), *Erica filipendula*, *Phaenocoma prolifera*, *Erica vestita* (wat baie mooi is), *Erica corifolia*, *Brunia laevis*, *Serruria elongata* (en daar is hordes bo-op Soetanysberg), *Leucospermum truncatulum*, *Lachnaea aurea*, *Restio persistens*, *Leucospermum cordifolium*, *Adenandra viscida*, *Protea speciosa* (ongelukkig nog net in die blomknop stadium), *Serruria fasciflora*, *Erica serrata*, groot plate van *Protea compacta*, veral tussen die sandsteen laer hoogtes en die kalksteenkoppies (waar net *Protea obtusifolia* voorkom); die uiters pragtige *Erica ampullacea*, *Tetraria thermalis* (wat baie lyk soos palmiet plante), die langsteel *Erica fascicularis* (kenmerkend op sy lang stingels, bo-op die berg), *Erica bruniifolia*, wit variante (of hibriede) van *Protea compacta* en *Protea obtusifolia*.



Serruria elongata op alkaliese sandsteen



Suur sandsteen met hordes *Protea compacta* – die Agulhas kuslyn lê in die verte



Ons nader die kalksteen bopunte van Soetanysberg (rooi pyltjie)



Kalksteen koppies (in rooi sirkels) bo-op die onderliggende sandsteen, met die geassosieerde plantegroei

Vervolgens sien ons ook *Chascanum cernuum*, *Metalasia calcicola*, *Stachys aethiopica*, *Lobelia pinifolia* teenaan die rowwe afklim helling, *Muraltia muraltioides* (endemies op kalksteen), *Roepera*

fuscata (endemies op kalksteen), *Eustegia minuta*, *Trichocephalus stipularis*, *Agathosma serpyllacea* en *Cliffortia ferruginea* met groter blare as wat ek sou verwag by *Cliffortia* spesies.



Roepera fuscata, 'n absolute endemiese kalksteen plant



Metalasia calcicola groei tussen die kalksteen klippe bo-op Soetanysberg

Metalasia calcicola is deel van 'n groter groep blombos struik (*Metalasia* spp.). Interessant is die spesie naam van *calcicola*, afgelei vanaf *calci-* vir 'kalk(steen)' en *cola* vir 'woning', bewoner bo-op kalksteen, of lief vir kalksteen!

fassinerende kalksteen fynbos, bo-op suur sandsteen fynbos, definieer. Die plante is absoluut aangepas by hulle substraat, daarom die rede hoekom hierdie plante so moeilik groei in 'n kwekery!

My plantlysie is heel lank, maar ek noem dit graag, met sommiges se foto's ter illustrasie. Ek kan ongelukkig nie al die mooi foto's plaas nie, maar wou net graag die

Ons waardering vir God se Skepping is ongelooflik, alhoewel my vriend verkies om eerder 'n evolusionis te wees.



Leucospermum truncatulum – 'n regte "limestone endemic", om die Engels te gebruik



Pelargonium betulinum



Tipiese kalksteen, met sy kalksteen fynbos



Ons geniet ons uitsig bo-op die kalksteen top van Soetanysberg

In Struisbaai, bo-en-behalwe *Mimetes saxatilis*, kry ons *Roepera fulva*, endemies tot kalksteen. Twee *Freesia* spesies in hierdie area is *Freesia leichtlinii* en *Freesia caryophyllacea*.

My stapdag eindig met papnat kouse, vol steekgrasse en selfs 'n bloedblaas op een van my tone, maar daar is niks wat combo calamari, geelvis en skyfies, saam met rooiwyn, 'n heerlike kaggelvuur en 'n volmaan, nie kan gesondmaak nie.



Freesia leichtlinii, 'n pragtige kalksteen spesialis

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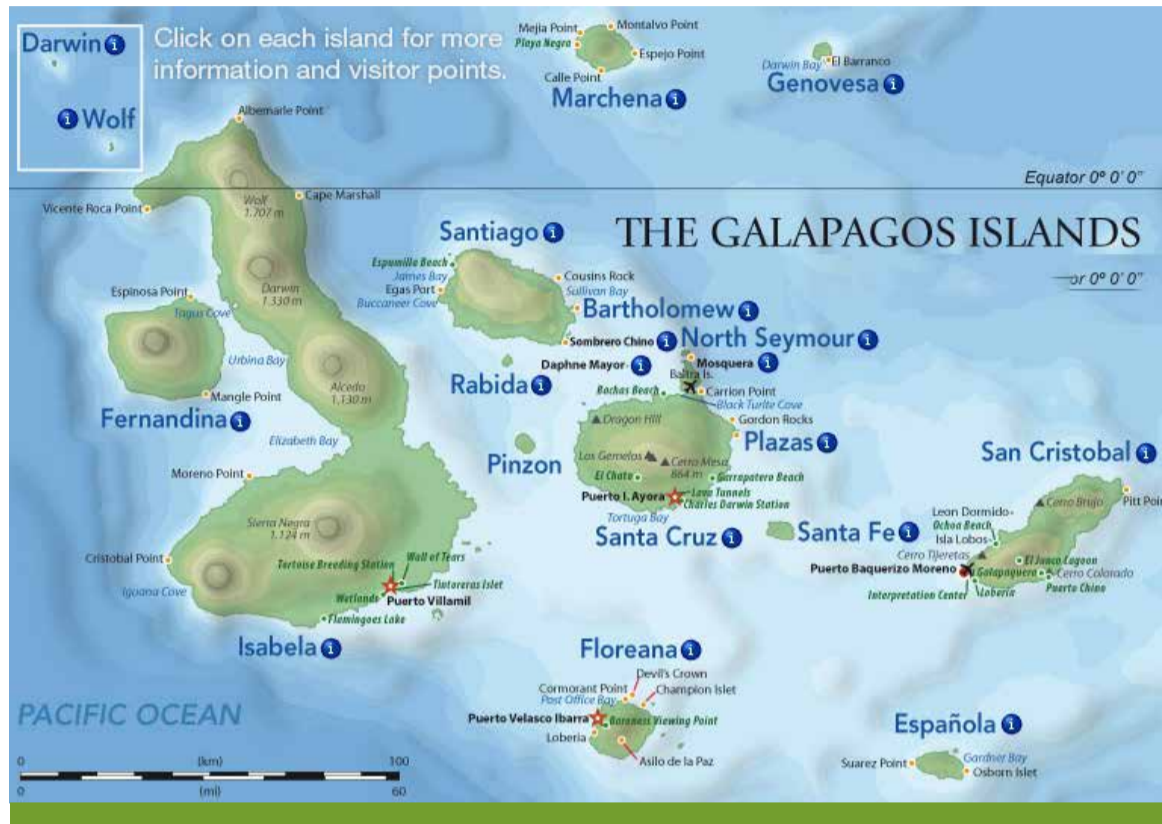
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The Flora of the Galápagos Islands

Dr Francois du Randt

I was very fortunate to visit these incredible archipelagos in 2018 on the Nemo II yacht and would like to give an insight in the natural history, volcanism, the origin of mangroves, the flora, mammals, reptiles, birdlife and a short insight in evolution.

As you fly into Baltra Island, where the International Airport is situated, you pay USD 100 conservation fee and go through a thorough search for anything foreign that you might bring into the wilderness of Galápagos. Please note that the name is pronounced as Galápagos, and not as Galapagos, as I knew it in my younger days.



Galápagos Islands (Photo: Internet)

The Galápagos Islands are volcanic in origin and situated in the Pacific Ocean, straddling the equator, about 960 km west of Ecuador in mainland South America, and 1 100 km from Costa Rica in Central America. The total land area of the archipelago is 7 882 km² and the coastline extends to 1 336 km. The islands stretch over a 320 km axis from east to west.

The Galápagos Islands were discovered in 1535. The fauna and flora have developed in isolation for many years. Charles Darwin visited these islands 300 years later and found the unique fauna and flora, which characterised these wonderful 'hot spot'. There is a

plant density of 68.7 species/1000 km². 43% of these species are endemic to Galápagos Islands.

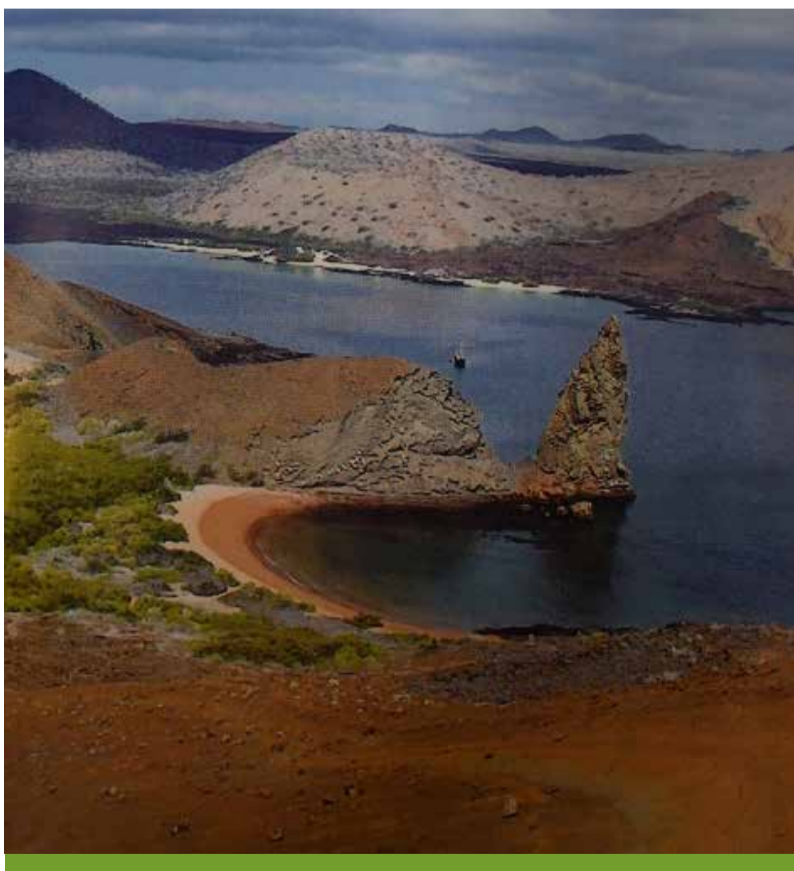
The archipelago is made up of 19 islands, with a surface area of 1 km², or larger, and 42 islets or surfacing rocks. 13 islands are bigger than 10 km². The largest island is Isabela Island, which extends to a surface area of 4 588 km². The highest point in Galápagos is Vulcan Wolf on Isabela, which rises to 1 707 m. The highest point on Fernandina Island is Vulcan La Cumbre, 1 494 m above sea-level. Five of the islands are inhabited and the resident population is approaching 17 000 (census of 2000).

The climate of Galápagos is unusually dry for the tropics, although there are considerable differences between the islands and much annual variation. However, there are two distinct seasons: the warm, wet season (December to May) and the Garúa (misty) or dry season (June to November). The wet season is hot and humid and heavy rains can occur. The Garúa season brings a subtropical climate, with the higher parts of the main islands often clothed in cloud for days on end. The direction of the prevailing south-easterly and north-easterly trade winds means that the rainfall is concentrated on the southern and eastern slopes of the higher islands, the northern and western slopes being drier.

A number of ocean currents converge in Galápagos and these have a direct influence on the climate. The most important currents include the cold Humboldt (Coastal Peru) current from the south, and the warm Niño Flow from the north. To the west of the archipelago this meets the cold, easterly-flowing Cromwell Current that provides a rich source of food for many seabirds and marine mammals that occur in Galápagos.

On average one year in seven, the relative flow of warm currents is much greater than usual, resulting in an El Niño event, well known in Southern Africa.

The volcanoes on the Galápagos Islands are less than 2 million years old, making them fairly young islands. Most of the rocks on the islands are basalt in origin.



Pinnacle Rock, Bartolomé Island

There were a few controversies in the past with regards to the expanding sea-floor theory and Continental Drifting. If the ocean floor was created at ocean ridges (at several centimetres per year), somewhere else crust must be destroyed because the Earth's surface was considered to be more or less constant. It was soon realised that ocean trenches were the places where crust was destroyed. This became known as the Theory of Plate Tectonics, thus crust creation at ridges and destruction at trenches!

The Lithosphere (the outermost shell of the Earth) is divided into a number of separate rigid slabs, or plates, that are moving relative to one another. The zones where the plates make contact are called plate boundaries. They are the most geological active on the planet – with earthquakes and volcanic activity. They are usually associated with some topographic feature such as a mountain range, or trench.

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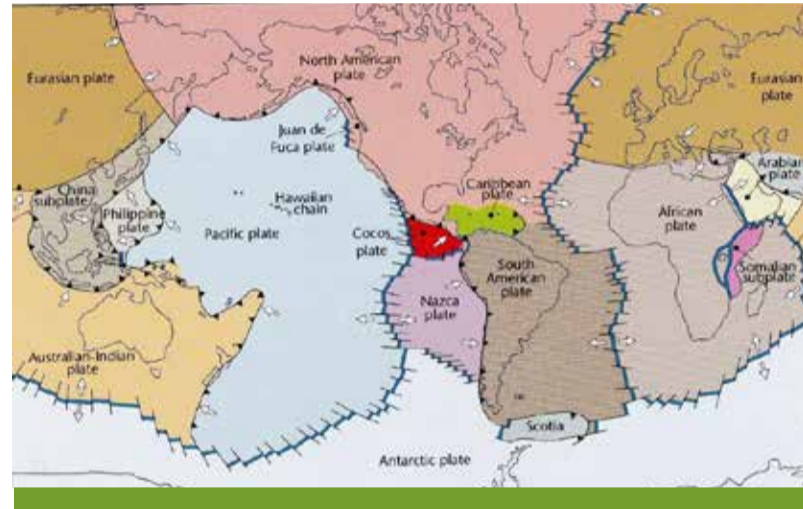
Galápagos is the meeting place of two submarine tectonic ridges, namely the Carnegie Ridge, west of South America, and the Cocos Ridge, south of Central America. The islands are situated on the northern border of the Nazca Plate, just underneath the Cocos Plate. The Nazca Plate is moving eastwards at a speed of 2 cm per annum, causing the upward rising of the Andes Mountain ranges.

Galápagos is thus a 'hot spot', an area of high thermic flux and intense seismic and volcanic activity, subject to almost annual eruptions. It is very much so part of the Pacific Ocean's Ring of Fire!

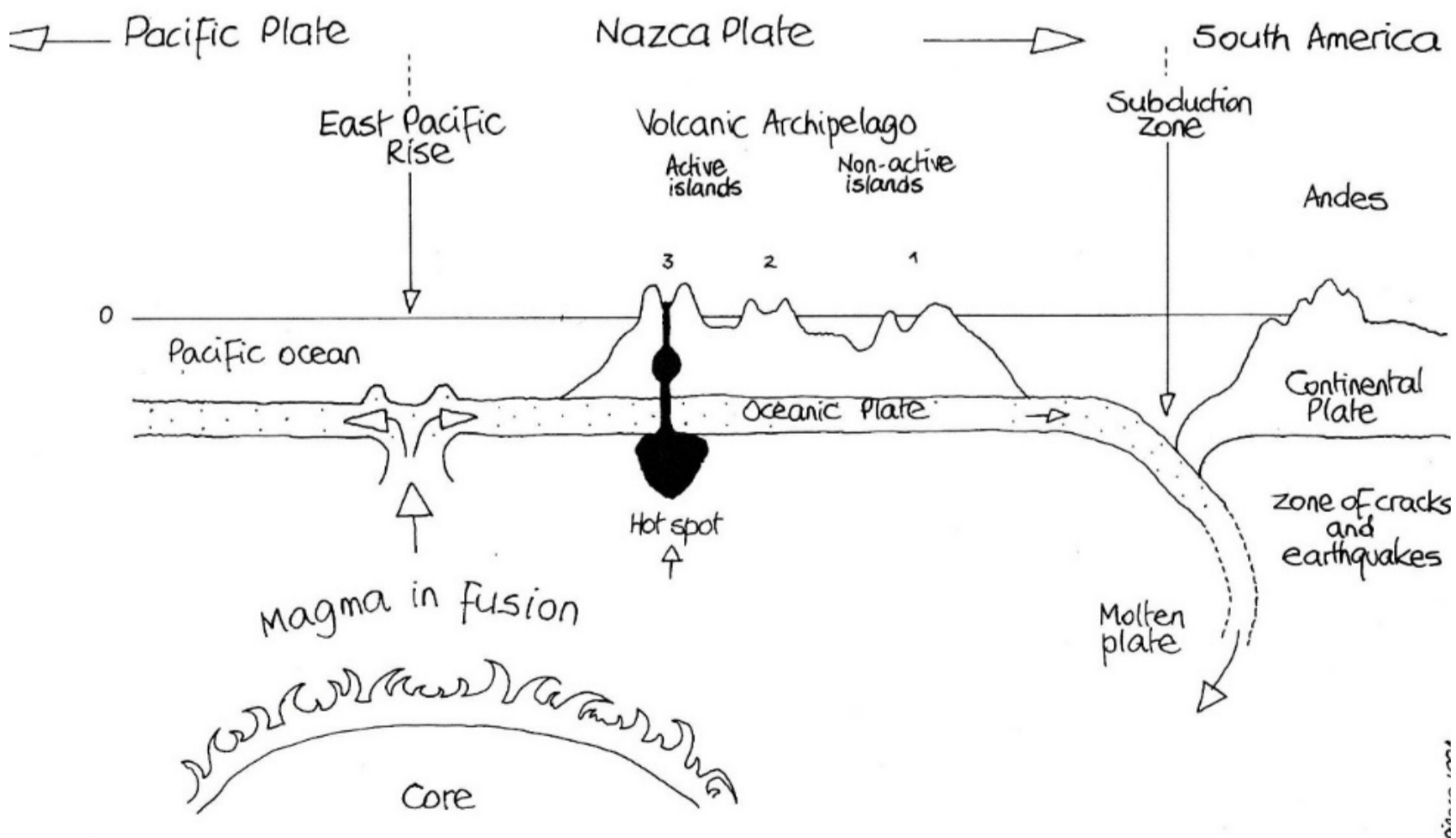
Isabela and Fernandina Islands as part of the Galápagos archipelago, are about 0.7 million years (700 000 years) old. In 1968 the crater floor of Fernandina Island sank about 300 meters, followed by a massive volcanic eruption. Two other important recent eruptions were Cerro Azul (1998) and Sierra Negra (2005), on Isabela Island. There were 13 volcanic eruptions in the Galápagos Islands over the past 100 years.



Sand Fynbos met *Tetradlea thermalis*, wat amper lyk soos palmiet



Tectonic ridges and Plates



Without going into too much details, the Galápagos archipelago is considered one of the largest and most active groups of oceanic volcanoes in the world.

FLORA IN THE GALÁPAGOS

The disharmony of the flora in the Galápagos is supported by the fact that the islands have never been connected to the continent (of America). There are no native gymnosperms (cone-bearing trees) and monocotyledons are poorly represented. Ferns represent a high percentage of the flora, and lichens are pioneer plants, which do not need any soil to grow. Orchids, with only 11 species in the archipelago, as opposed to 3 000 species on the continent of South America (especially Ecuador, Colombia and Peru), are poorly represented. There is also an absence of pollinating insects, which reduce the number of families and plants present on the islands.

There are 607 species of plants on Galápagos, of which 412 species are native, and 195 species (32%) were introduced by man.

Ferns, with spores dispersed by wind, are best represented in the archipelago, but endemic species

are few. Lichens, grasses and mosses are important due to their dispersal ability. Flowering plants of the *Compositae* family are very well represented. They are pioneer plants in the colonization of faraway islands.

There are seven endemic genera of plants found in the Galápagos:

- *Scalesia* (16 species)
- *Lecocarpus* (3 species)
- *Darwiniothamnus* (3 species)
- *Macrea* (1 species) – all above as part of the *Compositae* family
- *Jasminocereus* (1 species, 3 subspecies) – Cactae family
- *Brachycereus* (1 species) – Cactae family
- *Sicyocaulis* (1 species of vine) – Cucumber family

GALÁPAGOS MANGROVES

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The start of mangrove growth on the lava field



A fern creeps out between the lava rocks



Lava field and mangroves – the start of a habitat



Saltwater lagoon, Punta Moreno

The four mangroves are easily recognized by the shape of the leaves: oval in the white mangrove (*Laguncularia racemosa*) and elongated and pointed in the black mangrove (*Avicennia germinans*). The red mangrove (*Rhizophora mangle*) has bigger, arrow-shaped leaves, and stilt roots sticking out of the water. The button mangrove (*Conocarpus erectus*) is distinguished by conspicuous white buttons at the base of the leaves, at the end of the branches.

Ecuador has a total of 149 556 ha of mangroves, which include the Galápagos archipelago. The species in Ecuador include: *Achrostichum aureum*, *Avicennia germinans*, *Conocarpus erectus*, *Laguncularia racemosa*, *Pelliciera rhizophorae*, *Rhizophora harrisonii* and *Rhizophora mangle*.

The common names can be very confusing, as in South Africa, we talk about the white mangrove (*Avicennia marina*), the black mangrove (*Brugueria gymnorhiza*), and the red mangrove (*Rhizophora mucronata*), which are different from these abovementioned names, showing the importance of the scientific names!

Mangroves are common world-wide and a very important habitat in Mother Nature. They are under grave treat due to development and human population explosion. The mangroves in St. Lucia mouth, iSimangaliso Wetland Park, are all dead due to suffocation, causing the total ecosystem to be on the brink of collapse!



The origin of red mangroves (*Rhizophora mangle*)



The origin of red mangroves (*Rhizophora mangle*)



Rhizophora mangle (red mangrove) stilt roots and fruit



Rhizophora mangle at Santa Cruz Island – bigger leaves



The oval leaves of *Laguncularia racemosa* – white mangrove



Laguncularia racemosa in Puerto Ayora



The black mangrove (*Avicennia germinans*) on Rabida Island



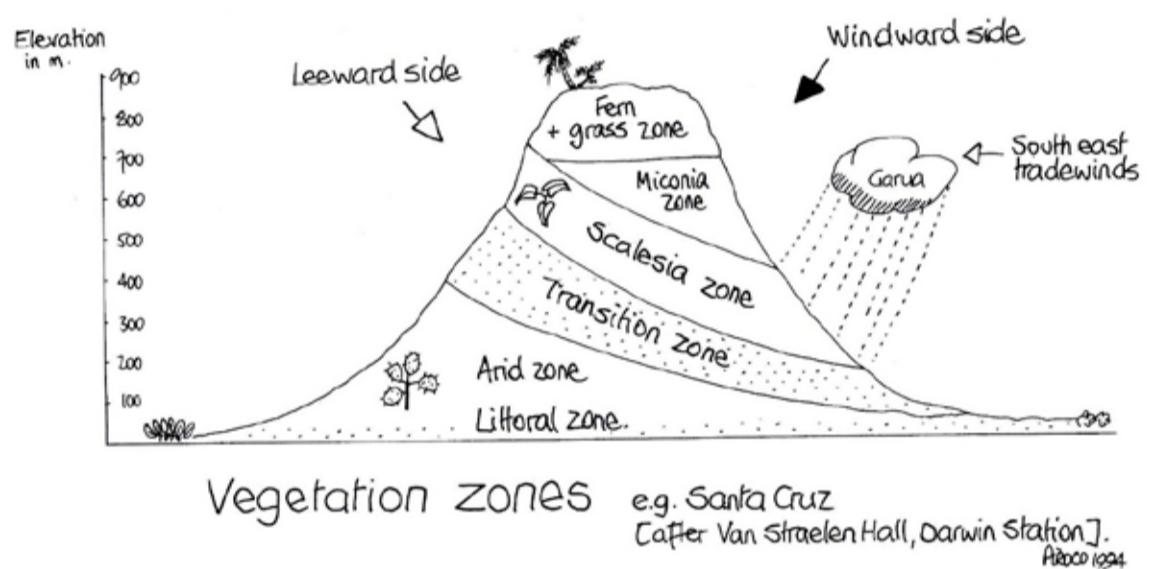
Avicennia germinans (black mangrove), with elongated, more pointed leaves



Conocarpus erectus - button mangrove

HABITATS OF THE GALÁPAGOS

The habitats of Galápagos can be divided into eight types, including the open sea and rocky islets. Six distinct **vegetation zones** are generally recognised which are broadly defined by altitude, reflecting the pattern of rainfall. The three vegetation zones which occur at the highest altitude are sometimes treated as one and termed the humid 'zone'. Some other references mention seven vegetation zones, which I will add in brackets.



Galápagos Islands (Photo: Internet)

These habitats are listed as follows:

- The open sea – characterized by vast numbers of seabirds, whales and dolphins.
- Rocky islets – there are many sparsely vegetated rocky islets in Galápagos archipelago, providing nesting sites for seabirds and some are home to marine iguanas and lava lizards.
- The shore (or littoral) zone – it includes the salt-water lagoons, rocky shores, sea cliffs and sandy beaches. Mangroves (see above), saltbush (*Cryptocarpus pyriformis*) and sea purslane, two species (*Sesuvium edmonstonei* and *Sesuvium portulacastrum*) can tolerate the saline conditions. The habitats of the shore zone support many seabirds, water birds, shorebirds as well as some land birds. The most obvious mammalian inhabitants are the Galápagos sea lions, marine iguanas and turtles. In addition, lava lizards, leaf-toed geckos and snakes can occasionally be seen.
- The arid zone – this is the most diverse and extensive of all the vegetation zones in Galápagos. It is found on all of the main islands. The plant communities are characterised by the presence of three endemic cacti species (*Opuntia*, *Jasminocereus* and *Brachycereus*) and deciduous trees such as Palo Santo (*Brusera graveolens*), Palo Verde (*Parkinsonia aculeata*) and acacias (like *Acacia rodrigiana*). There are also spiny shrubs (like *Scutia pauciflora*), and *Maytenus octogona*. These habitats are home to virtually all the species of land birds and also provide nesting sites for some seabirds, such as boobies and storm-petrels. Most of the reptiles, notably lava lizards and land iguanas, are at their most numerous in this zone. Rice rats also occur.
- The transition zone – this zone is characterised by a reduced number of trees and shrubs, and with more lichens and perennial herbs. Most of the agricultural areas occur in the transition zone. This zone climbs up between 100 and 200 metres in elevation but may rise up to 500 metres on the leeward side. The characteristic plant of this zone is pega (*Pisonia floribunda*). The local name means 'stick stick', because the leaves of this tree will 'grab' your fingers.
- The humid zone – it encompasses the three distinct broad vegetation types that occur in the higher parts of the larger islands
 - The *Scalesia* zone – from 200 to 400 metres, this is a moist, lush cloud forest-type vegetation which consists of dense shrubs dominated by *Scalesia* trees. These trees are endemic to Galápagos, can reach a height of almost 20 m, and are festooned with mosses, liverworts, ferns, bromeliads and orchids. It provides breeding sites for the dark-rumped petrel. There are 16 species of *Scalesia* (giant daisy trees) in Galápagos, with *Scalesia pedunculata* (lechoso) as the most prominent. The *Scalesia* forest climbing up the slopes of Santa Cruz volcanoes is a beautiful sight.

Some references mention the Brown zone, which is the end of the *Scaezia* zone, characterised by liverworts (brown mosses).

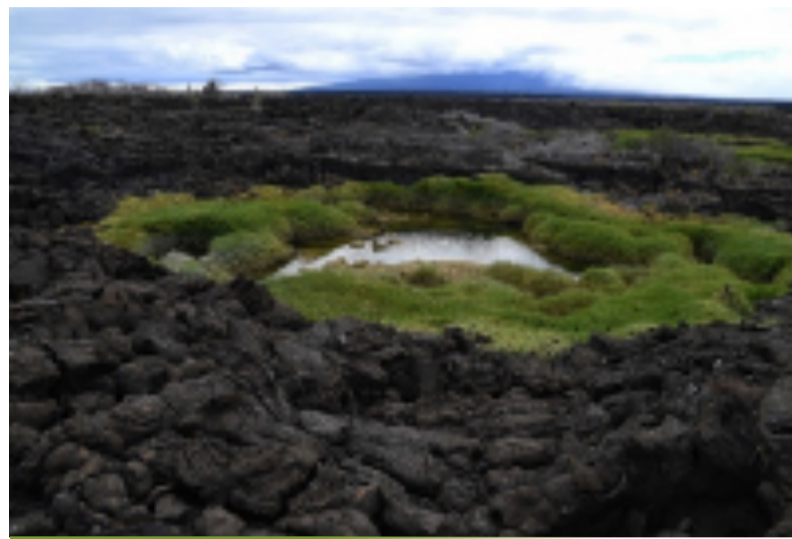
- *Miconia* zone – the very wet, high altitude *Miconia* zone is found only on the southern slopes of Santa Cruz and San Cristóbal Islands, rising up to 1000 metres. It is treeless and occurs above the *Scaezia* zone, being characterised by dense stands of the highly endangered, endemic *Miconia robinsoniana* (cacaotillo) shrub. The leaves resemble cacao, hence the common name.



The saltbush (*Cryptocarpus pyriformis*) is a bush with fat, green leaves, very common on the islands. The local name is monte salado

- The Pampa zone – the highest and wettest vegetation zone in Galápagos, dominated by grasses, sedges and ferns, including the Galápagos tree fern (*Cyathea weatherbyana*), that can grow up to 3 m.

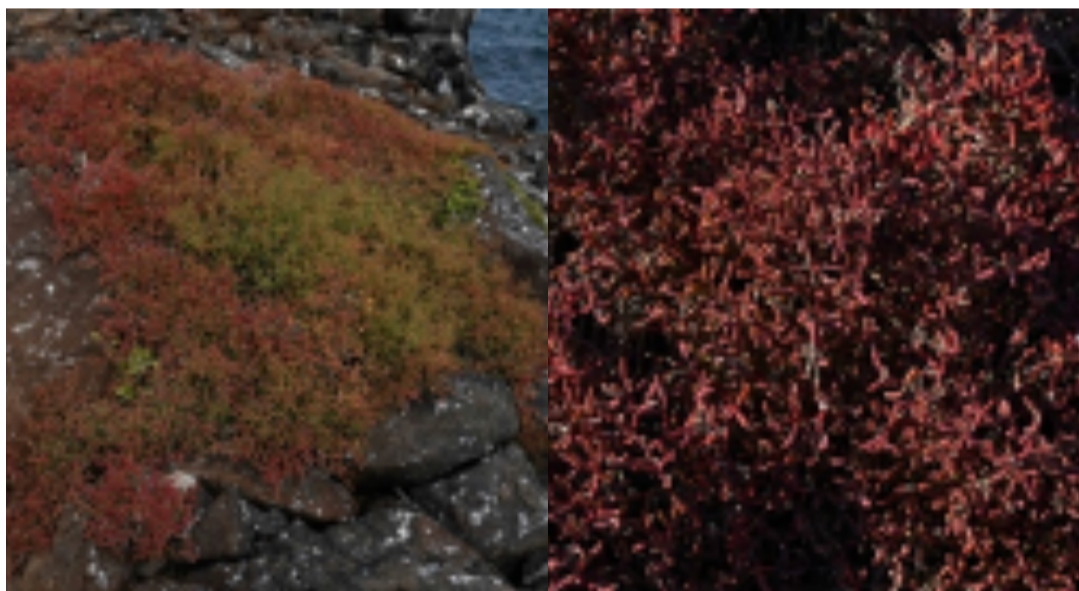
A few more endemic plants of Galápagos include *Scaezia helleri*, the shore Petunia (*Cacabus miersii*), located at Punta Espinosa, Fernandina Island; *Opuntia cacti*, *Opuntia echios* var. *gigantea*, cut leaf daisies (*Leocarpus pinnatifidus*), *Jasminocereus* spp., sea anemone, and the endemic grenadella (*Passiflora foetida galapagoensis*).



Sesuvium edmonstonei starts growing next to saltwater lagoons

Both sea purslane species are very colorful succulents. They are pioneer-type saline species. Flowers are pink or white, according to the species: *Sesuvium edmonstonei* (white flowers) and *Sesuvium portulacastrum* (pink flowers). *Sesuvium edmonstonei* is also known as the Galápagos carpet weed.

The arid zone is home to the Palo Santo tree (*Bursera graveolens*). It is a tree with white bark, which has leaves only during the wet season. It belongs to the Burseraceae family. In South Africa all our *Commiphora* species belong to the Burseraceae family. The bark is very aromatic. Our guide called the Palo Santo tree the 'Holy Stick'. The bark smells like cannabis, possibly the reason for the local name 'holy'.



Sesuvium edmonstonei



Bursera graveolens (Palo Santo trees), leafless



New leaves appearing on *Bursera graveolens*

Three dominant plants, very much associated with, occur on Galápagos Islands, namely *Opuntia*, *Jasminocereus* en *Brachycereus*. They are very prominent on North Seymour Island, Rabida Island and Santa Cruz Island, but are fairly widespread. The town of Puerto Ayora is on Santa Cruz, most likely the most inhabited island of the archipelago.

Opuntia echios var. *gigantea* is a large and beautiful cactus in the archipelago setting. (I never thought I will call these cacti 'beautiful', for sure not in South Africa where they are declared invader weeds!), but the number of cacti are interesting and they are very important food sources for both the land iguana and giant tortoises. They have a xerophytic adaptation, by having small leaves and succulent branches.

The candelabra cactus (*Jasminocereus thoarsii*) has edible fruits and grow easily between the lava rocks. Another resident at home between the lava rocks is the lava cactus (*Brachycereus nesioticus*). There are also other *Opuntia* species, like our invader species, with edible and delicious fruits. The scientific name is interesting. In Zululand we have a serious invader cactus, called *Cereus jamacaru*, also known as *Cereus peruvianus*, the queen-of-the-night, originating from the Atacama Desert regions of Peru and Chili.



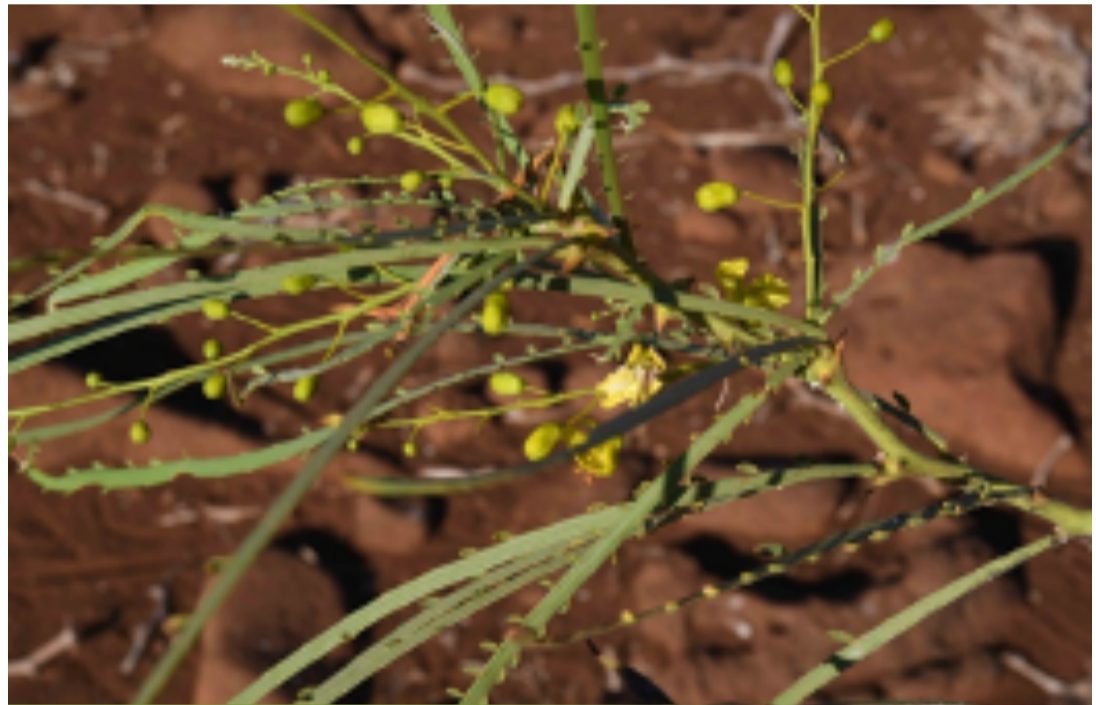
Here are two cacti species: *Jasminocereus thoarsii* (left) and *Opuntia echios* (on the right)

The words *Brachy* means short (arms) and *Jasmino* means Jasmin-like.

A xerophytic adapted tree with deep roots is the Jerusalem thorn (*Parkinsonia aculeata*). It does not have many leaves.



Jasminocereus thouarsii
(Candelabra cactus)



Jerusalem thorn (*Parkinsonia aculeata*)

I name a few more plants from Galápagos: the salt wort (*Batis maritima*), Galápagos club leaf (*Nolana galapagensis*), Galápagos purslane (*Portulaca howellii*), beach morning glory (*Ipomoea pes-caprae*), *Polygala sancti-georgii*, *Piscidia carthagenensis*, *Solanum cheesemaniae*, *Passiflora suberosa*, *Thornefortia pubescens*, *Waltheria ovata*, Galápagos bromelia (*Racinaea insularis*), Galápagos mistletoe (*Phoradendron henslowii*), Galápagos guava (*Psidium*

galapagejium), Galápagos orchid (*Epidendrum spicatum*), Quinine (*Cinchona pubescens*), Galápagos tree fern (*Cyathea weatherbyana*), a common fern (*Pteridium arachnoideum*) and the *Scalesia* species.

At Puerto Egas I saw *Croton scouleri* (the Galápagos Croton), a shrub with grey stems, orange to yellow-green leaves and fruit like capsules. It is locally known as Chala.



Leafless *Croton scouleri* on Santiago Island



The leaves of *Croton scouleri*



Hippomane mancinella (poison-apple tree)

A poisonous tree at the Darwin Breeding Centre on Santa Cruz is the Manzanillo, or poison-apple (*Hippomane mancinella*). Our local guide informed us that this tree is highly toxic, and you cannot even touch its leaves (some superstitious wrong ideas, like our same *Erythrophleum lasianthum* or *Euphorbia cupularis* (syn. *Synadenium cupulare*). The toxic white



Hippomane mancinella (poison-apple tree) with fruits

sap may burn the skin and the eyes. If the fruit are eaten, very painful stomach cramps may result.

A beautiful tree with yellow flowers, which is common, is *Cordia lutea* (Muyuyo). The arid zone blooms with 'annual plants' during the wet season.



Cordia lutea with yellow flowers



Cordia lutea in fruit

Whereas *Psidium guayaba* is introduced to Galápagos, we find the indigenous guayabillo (*Psidium galapageium*), fairly spread out and conspicuous. The bark of this tree is soft and pinkish grey.

Beautiful furniture and ornaments are made of the lovely aromatic wood of the Cuban cedar tree (*Cedrela odorata*). It originates from Central America and Cuba. It is an invader species in Galápagos.

The most prominent tree in the *Scalesia* zone is *Scalesia pedunculata*. This is in the very humid zone with constant precipitation. A few other species are *Scalesia dentatae*, *Scalesia lobatae* (or *Scalesia helleri*), and *Scalesia foliosae*. Santa Cruz Island is the best place to look at these vegetation zones.

Unfortunately, time and bad weather restricted my visit to the *Miconia* and *Pampa* zones, where we find *Miconia robinsoniana* (cacaotillo), the leaves resemble cacao, and the Galápagos tree fern (*Cyathea weatherbyana*). The moist pampa is a microclimate in itself. One can easily spend a few days on Santa Cruz or San Cristóbal to explore these extreme habitats.



The canopy of *Scalesia pedunculata* (Photo - Internet)



Miconia robinsoniana (Photo - Internet)

Cyathea weatherbyana (the Galápagos tree fern) (Photo: Ana Mireya Guerrero, iNaturalist)

The thread leaf Darwin bush (*Darwiniothamnus tenuifolius*) has beautiful white flowers, appearing between the pahoehoe lava.

A beautiful species is the Galápagos cotton (*Gossypium barbadense* var. *darwinii*), with its yellow flowers and

cotton-like fruits. One prominent tree in the transitional zone is the Matazamo (*Piscidia carthagenensis*). One also gets *Erythrina velutina* and a few *Acacia* species, like *Acacia rorudiana*, *Acacia macracantha*, *Acacia insulae-iajobi*, and even our own *Acacia nilotica* (*Vachelia nilotica*), as an exotic invader!



Darwiniothamnus tenuifolius appears between the lava rocks



Gossypium barbadense var. *darwinii* in flower



Gossypium barbadense var. *darwinii* in fruit



Acacia rorudiana, one of a few *Acacia* spp. on the islands

A must visit in the Galápagos archipelago is **Tagus Cove**, with a steep hike through dry Palo Santo trees (*Bursera graveolens*) and its aromatic cannabis smell. Tagus Cove and Darwin Lake is situated on the west coast of Isabela Island, between the two craters of Vulcan Darwin and Vulcan Alcedo.

On Rabida Island, known for its beautiful red volcanic beaches, we found *Portulaca howellii* and *Maytenus octogona*. The saltwater lagoons are incredibly beautiful.



A hiking map of the area around Tagus Cove and Darwin Lake



Portulaca howellii



Maytenus octogona



A type of lichen, *Mollugo crockeri*



Brachycereus nesioticus (lava cactus)

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Frost damage observed in Pretoria after very cold weather in July 2024

Isak Lombard – Magaliesberg Branch

BACKGROUND

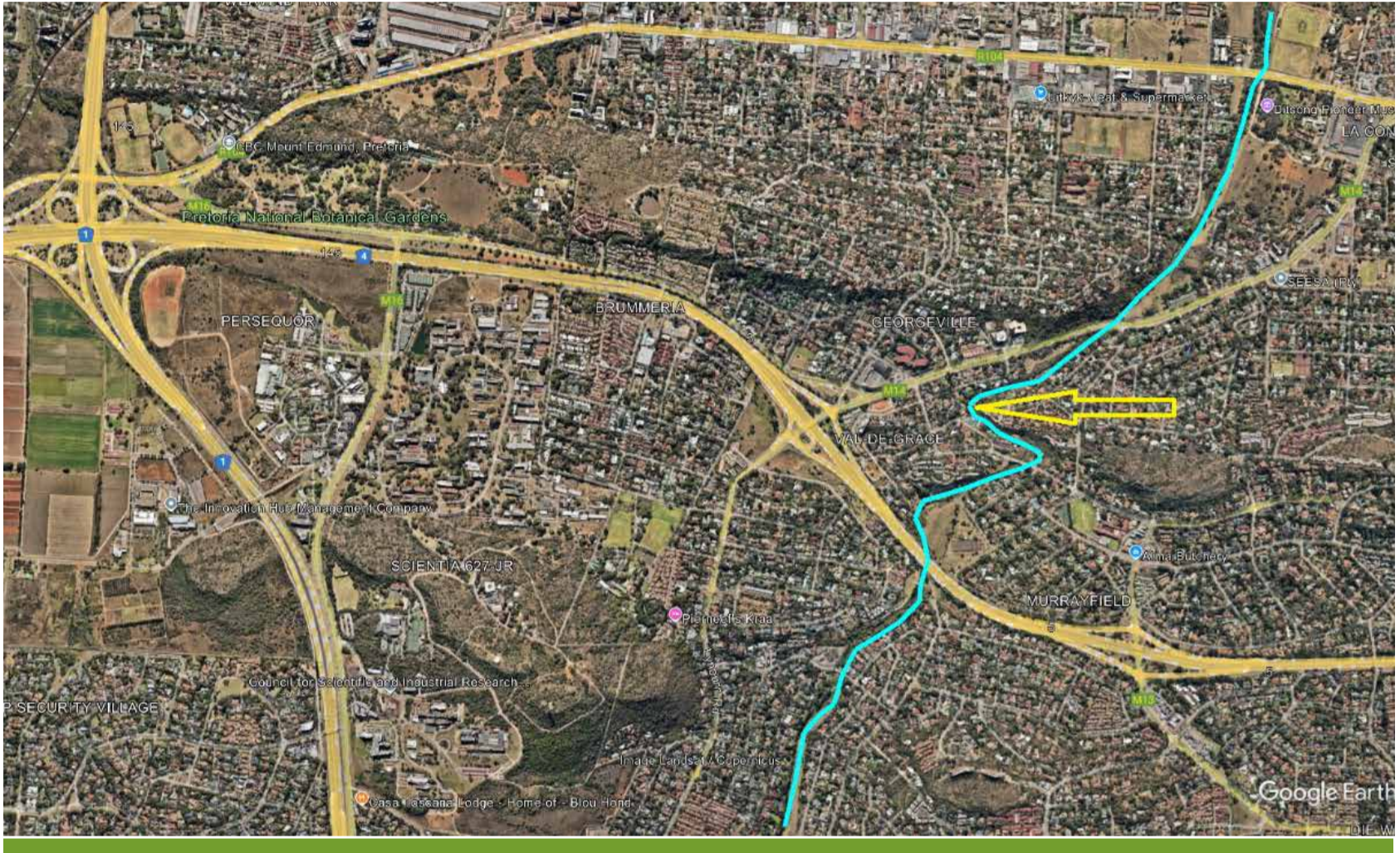


Figure 1 - Location

During July, a few days after we had an exceptionally cold night, we noticed many scorched plants in our garden. I also noticed different degrees of damage to different species and started to note my observations. We live on the banks of the Moreleta Spruit in Pretoria, about 1 300 m above sea level.

Normally we experience minimum temperatures of about 3°C lower than the minimum of the Pretoria forecast. The river course is below the surrounding areas and provides a channel for cold air movement. The night of 9 July 2024 was one of the coldest in the season. I managed to obtain the minimum temperature of the Irene weather station for confirmation:

During the cold night there was a slight breeze. It appears that buildings offered little protection against the penetrating coldness.

Just as you need heat to melt ice the opposite happens when water freezes. Energy of 334 kJ/kg (also called

the latent heat of fusion) is released when water at 0°C changes to ice at 0°C. Water “protects” the plant when the temperature drops because the temperature remains at 0°C during the freezing process and only after all the water has frozen does the temperature drop further. The same is true when water vapour freezes (it releases 2837 kJ/kg), the opposite of sublimation. The morning of 10 July was extremely dry with a humidity of about 20% (records from the Irene weather station) with very little water vapour to protect the plants. I believe that this dry air contributed to the low temperatures that damaged the plant cells. Some people also refer to this phenomenon as black frost.



Figure 2 - Minimum temperature Irene weather station

OBSERVATIONS

I grouped the trees in my area in 3 categories depending on the effect caused by the cold:

Category A – no visible damage

The following plants were observed as part of Category A, where no visible damage could be seen: *Vachellia karoo*, *Searsia lancea*, *Vepris lanceolata*, *Buddleja salviifolia*, *Buddleja auriculata*, *Combretum imberbe*, *Euclea crispa*, *Mystroxylon aethiopicum*, *Olinia emarginata*, *Calpurnia aurea* and *Bolosanthus speciosus*.

Fellow members of the Dendrological Society added the following to the list: *Afrocanthium gilfillianii*, *Searsia pyroides*, *Heteromorpha arborescens*, *Dodonea viscosa* and *Apodytes dimidiata*, *Buddleja saligna* and *Freylinia tropica*.

Note that it was difficult to categorize plants without leaves, for example *Celtis*, but generally they were in Category A. The following shows some pictures taken after the cold night:



Figure 3 - *Buddleja auriculata*



Figure 4 - *Combretum imberbe*
The leadwood (hardekool) was surprisingly resistant and showed no signs of cold damage, contrary to many beliefs that it only grows in hot areas.



Figure 6 - *Calpurnia aurea*

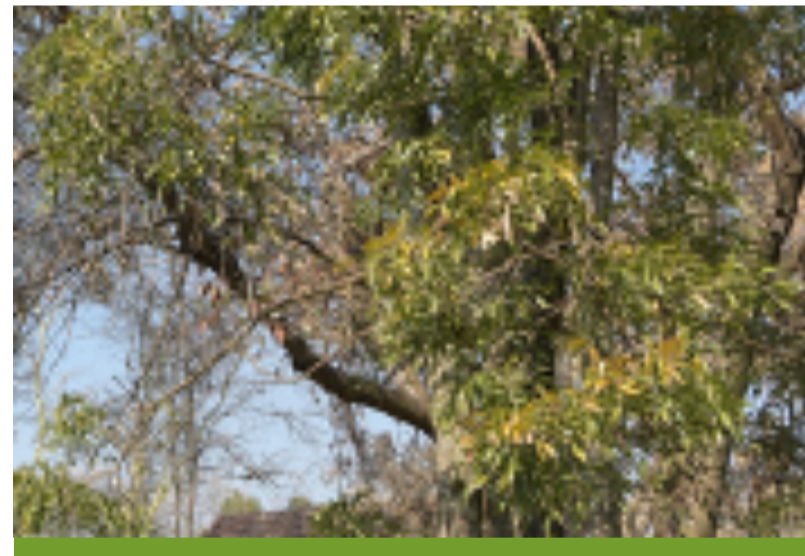


Figure 5 - *Bolosanthus speciosus* (vanwykshout) had very slight damage at the top



Category B - Partial damage (e.g. dry leaves on the tree edges)

These trees showed partial damage, especially along young shoots and higher branches. The following

is a list of observed trees in this category: *Ekebergia capensis*, *Halleria lucida* (new shoots), *Schotia brachypetala*, *Carissa macrocarpa*, *Combretum kraussii* and *Kraussia floribunda*. The few pictures depicting the partial damage:



Figure 7 - *Schotia brachypetala*
Note the damage on the upper branches



Figure 8 - *Strelitzia nicolai*

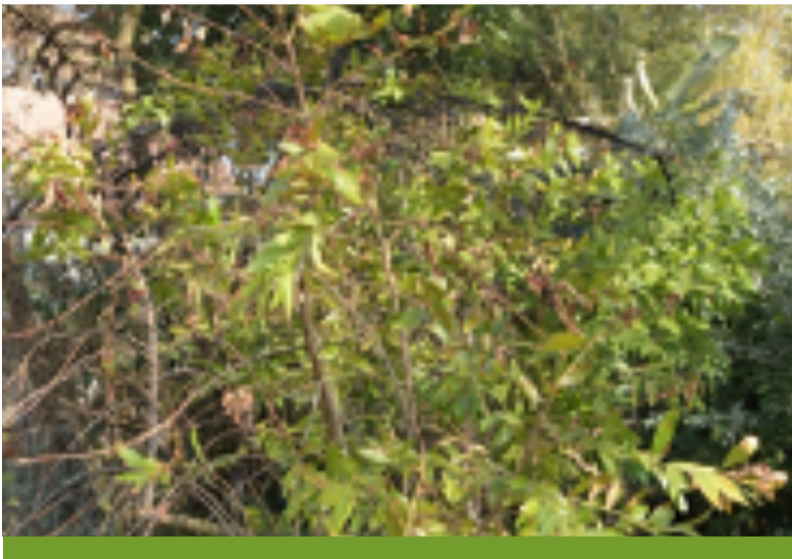


Figure 9 - *Kraussia floribunda*



Figure 10 - *Halleria lucida*

Damage was seen on the new leaves and new vertical shoots of *Halleria lucida*. After about 4 months it fully recovered and is growing fast.



Figure 11 - *Carissa macrocarpa*

Category C - total damage with all leaves dry

Total damage was observed in the following species: *Kigelia africana*, *Mackaya bella*, *Vachellia sieberiana* subsp. *woodii* and *Cussonia spicata*. Fellow Dendrological society members added *Harpephyllum*

affrum, *Heteropyxis natalensis*, *Bauhinia natalensis* and *Portulacaria afra* to the list.

The following are examples of plants that suffered the most, with all green leaves and branches damaged by the frozen plant cells:



Figure 12 - *Vachellia sieberiana* subsp. *woodii*



Figure 13 - *Kigelia africana* - New leaves, against the main branches, only appeared about 10 weeks after the cold spell.

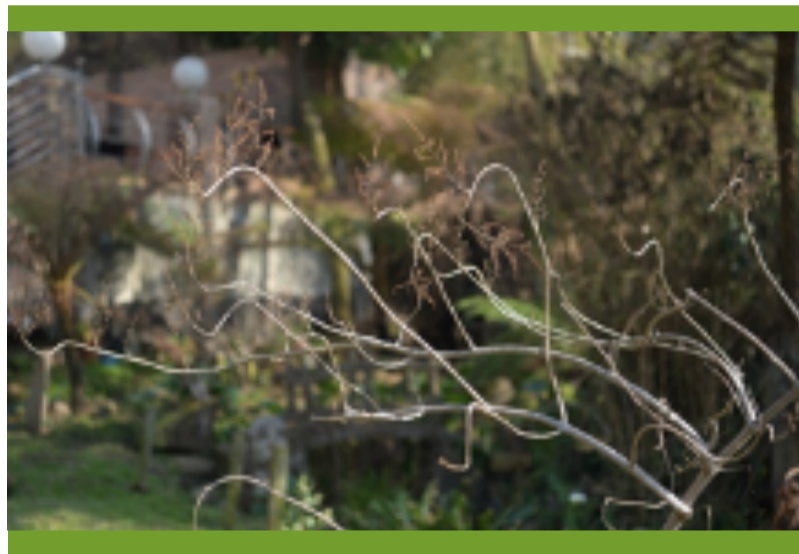


Figure 14 - *Tetradenia riparia* - The *Tetradenia* damage was severe. Smaller branches were totally dead. Some new leaves emerged from the bottom of the tree against its trunk 3 months later.



Figure 15 - *Mackaya bella*
This was the first time in 30 years that the *Mackaya bella*'s damage was this bad.

CONCLUSION

In summary, species of the 3 categories are listed in table below:

Category A (no damage)	Category B (Partial damage)	Category C (total damage)
<i>Afrocanthium gilfillanii</i>	<i>Carissa macrocarpa</i>	<i>Bauhinia natalensis</i>
<i>Apodytes dimidiata</i>	<i>Combretum kraussii</i>	<i>Harpephyllum affrum</i>
<i>Bolosanthus speciosus</i>	<i>Ekebergia capensis</i>	<i>Heteropyxis natalensis</i>
<i>Buddleja auriculata</i>	<i>Halleria lucida</i>	<i>Kigelia africana</i>
<i>Buddleja saligna</i>	<i>Kraussia floribunda</i>	<i>Mackaya bella</i>
<i>Buddleja salviifolia</i>	<i>Schotia brachypetala</i>	<i>Portulacaria afra</i>
<i>Calpurnia aurea</i>		<i>Tetradenia riparia</i>
<i>Combretum imberbe</i>		<i>Vachellia sieberiana</i> subsp. <i>woodii</i>
<i>Dodonea viscosa</i>		
<i>Euclea crispa</i>		
<i>Freylinia tropica</i>		
<i>Heteromorpha arborescens</i>		
<i>Mystroxylon aethiopicum</i>		
<i>Olinia emarginata</i>		
<i>Searsia lancea</i>		
<i>Searsia pyroides</i>		
<i>Vachellia karoo</i>		
<i>Vepris lanceolata</i>		

The above categorization may be helpful when selecting garden plants that could withstand exceptionally cold temperatures.

Die ionakanniedood (*Commiphora omundomba*), 'n nuwe boomspesie vanuit Angola en Namibië

Wessel Swanepoel

Posbus 21168, Windhoek, Namibië | Selfoon: +264 811246174 | e-pos: wessel@kaokosafari.com

Kanniedoodbome (*Commiphora*-spesies) is 'n bekende gesig in die Die Kaokoveld van noordwes Namibië en suidwes Angola. Dië bome verleen dikwels die enigste groen skynsel in 'n andersinds barre landskap. Kenmerkend van die Kaokoveld is die uitgestrekte landskappe wat wissel van duineveld en kaal woestynvlaktes in die weste (die Namib-woestyn) en verder oos die Groot Eskarp van suider-Afrika met die gepaardgaande berge en die mopanie-savannas van die Himba-hoogland in Namibië. In Angola is die mopanie-savanna deels wes en oos van die eskarp met die Angola-hoogland wat oos van die eskarp lê. Tesame met die talle seisoenale rivierlope en die standhoudende Kunenerivier wat die internasionale grens tussen Angola en Namibië vorm, huisves die uiteenlopende landskappe dan 'n hele aantal kanniedood-soorte. Die Kaokoveld is 'n Sentrum van Endemisme vir die genus en tydens die laaste 60 jaar is 11 nuwe endemiese soorte beskryf vanuit die Kaokoveld waarvan 6 die afgelope 20 jaar. Die syfers gee 'n aanduiding van hoe afgeleë en bio-diversiteitsgewys onder-ondersoek die deel van suider-Afrika steeds is. Die opspoor van nog 'n nuwe, endemiese kanniedood uit die gebied was dus nie heeltemal onverwags nie.

Tydens talle botaniese ekspedisies in die Kaokoveld in beide Angola en Namibië, is 'n kanniedood opgemerk met ligkleurige, gladde bas en 3-ledige blare. Soos meeste kanniedoodbome het die pit 'n rooi of oranje pseudo-aril gehad. 'n Taai, witkleurige aromatisiese melksap het die boom in 'n groep geplaas met soortgelyke sap en bas waaronder spesies soos *Commiphora dinteri*, *C. kaokoensis* en *C. namaensis*.



Kuskrans noord van Mossamedes, Angola

Aangesien *C. dinteri* van wes-sentraal Namibië ook 3-ledige blare het, is vir 'n lang tyd geglo dat die Kaokoveld-plantte juis *C. dinteri* verteenwoordig. Daar was egter ook verskille: die blaarrand van die Kaokoveld-plantte was minder getand of selfs gaafrandig in plaas van getand en die blomme het dikwels net drie kroonblare en drie pare helmstrate – 'n eienskap wat a-tipes is van *Commiphora* waar 4 kroonblare en 4 of 8 helmstrate die norm is.



Effens getande blaarrand



Gaafrandige blare



Pit met pseudo-aril

Analise van DNS-data deur Dr Andrea Weeks van Virginia in die VSA het toe aan die lig gebring dat die Kaokoveld-plantte 'n nuwe spesie verteenwoordig met die naasverwante spesie *Commiphora buruxa* van die Oranjeriviervallei in die suide van Namibië! *Commiphora omundomba* is dus in 2022 as nuut beskryf en gepubliseer in die botaniese joernaal *Phytotaxa**, deur die skrywer en kollegas Prof. Braam van Wyk -- die bekende plantkundige van Pretoria, asook Dr Andrea Weeks.

Die spesifieke epiteton "*omundomba*" is die Ovahimba naam vir die nuwe spesie. As Afrikaanse en Engelse name is ionakanniedood en Iona corkwood onderskeidelik voorgestel aangesien die Iona Nasionale Park in suidwes-Angola die digste bevolking van die nuwe spesie huisves. Iona (uitgespreek ie-jō-na), is die naam van 'n vorige Himba-hoofman van die gebied en sy tuiste was by die huidige nedersetting met dieselfde naam.

Die ionakanniedood (*Commiphora omundomba*), 'n nuwe boomspesie vanuit Angola en Namibië

Op seevlak aan die Angolese kus is die ionakanniedood 'n laaggroeiende vetplantagtige struik met spreidende relatief lang 'seekatagtige' takke, maar verder die binneland in, soos ook in Namibië, 'n struikagtige boom tot van 2.5 m hoog met 'n kort dik stam of veelstammig van net bokant grondvlak. Soos al die ander kanniedoodbome in die Kaokoveld kry die ionakanniedood nuwe blare in die lente en tydens winter verkleur en verdroog die blare met die gevolg dat die plante vir die grootste deel van die jaar blaarloos is.



Kort, dik stam en vertakking naby grondvlak



Ronde struik, suidwes van Roodrom, Namibië

Die ionakanniedood se verspreidingsgebied strek in 'n relatief nou strook vanaf die kusstreek Santa Maria in Angola suidwaarts oor die Kunenerivier verby Orupembe tot naby Puros in Namibië op hoogtes van tot 1 300 m bo seevlak. Die boom kan die maklikste gesien word op die woestynroete (wes van die Hartmannberge) tussen Orupembe en Roodrom op 'n reis na en van die Marienfluss en groei op die walle van of langs droë rivierloopies of teen heuwels en berghange.

* Vir meer inligting kan die artikel gratis van die internet afgelaai word: "*Commiphora omundomba* (Burseraceae), a new species from Angola and Namibia" [Commiphora omundomba \(Burseraceae\), a new species from Angola and Namibia | Phytotaxa](#)



Laaggroeiend met spreidende seekatagtige takke, kuskrans noord van Mossamedes, Angola



Seekatagtige spreidende takke met blare



Struikagtige boom, Iona Nasionale Park, Angola



SOUTHERN BEECH FORESTS, with special reference to the temperate rain forests of New Zealand

Dr. Francois du Randt

The Southern Beech forests refer to the genus *Nothofagus*, with 35 to 40 species of trees and shrubs, in the family Nothofagaceae, formerly part of the worldwide family of Fagaceae (beeches). They occur natively in the cooler regions of the Southern Hemisphere, in South America (southern Argentina and Chile, the region called Patagonia), southern Australia, New Zealand, New Caledonia and the mountains of New Guinea.

They have an unusual distribution (see map) cited as evidence of the continental drift after the breakup of the single large continent of Gondwana, more than 145 million years ago. Their fruits are highly susceptible to damage by seawater. The plants could occur where they do only by rafting of the continents, or by the very unlikely event that their seeds were transported by birds across vast distances of open ocean.

They do not occur in Southern Africa, which was part of Gondwana, but was situated more to the drier centre of the continent. The beeches occurred in the colder and wetter southern areas of Gondwana.

Nothofagus was first described in 1850 by Carl Ludwig Blume. It must be clearly distinguished from the beeches (*Fagus*) native to Eurasia and North America, with 13 species of which the European beech (*Fagus sylvatica*) is regarded as the most common species.

The most important species are *Nothofagus antarctica* and *Nothofagus obliqua*, both taller than 30 m and native to Patagonia (Argentina & Chile), *Nothofagus moorei* (Australian beech) in New South Wales, *Nothofagus cunninghamii* (Tasmanian myrtle, or red myrtle), growing up to 60 m tall in Tasmania, the 30 m tall *Nothofagus fusca* * (red beech) and the silver, or southland beech (*Nothofagus menziesii*)* in fiord land, New Zealand.

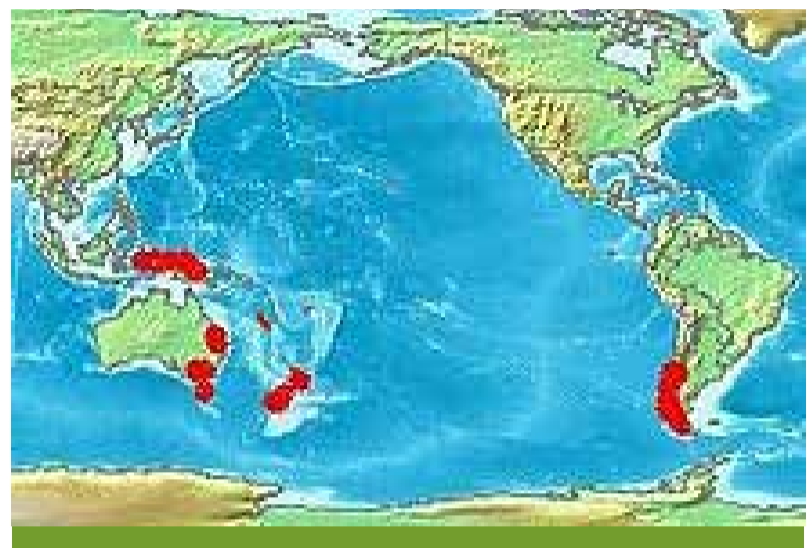
The name *Nothofagus* means 'false beech', from *noto-* and *fagus* (beech). They are very important in the timber industry, second only to that of the eucalypts.

*The scientific name *Nothofagus* is now used as synonym for *Fuscospora* or *Lophozonia* in New Zealand, highlighting the differences in opinion between the evolutionists (or man-in-the-veld opinion) and molecular DNA phylogenetic (the office-taxonomists). In New Zealand *Nothofagus* is regarded as the older name, but it was changed to *Fuscospora* or *Lophozonia* – even in my reference books these names are controversial.

In short, according to iNaturalist (fossils show that the genus originated on Gondwana) there are 43 species of *Nothofagus*, and Plants of the World Online (POWO) accepted the New Zealand species as of April 2023 as: *Nothofagus cliffortioides* (mountain beech), *Nothofagus fusca* (red beech), *Nothofagus menziesii* (silver beech), *Nothofagus solandri* (black beech) and *Nothofagus truncata* (hard beech).

However, 4 subgenera are recognised, based on morphology and DNA analysis:

- Subgenus: *Fuscospora* – 6 species (in New Zealand: *cliffortioides*, *fusca*, *solandri* and *truncata*)
- Subgenus: *Lophozonia* – 7 species (in New Zealand: *menziesii*)



- Subgenus: *Nothofagus* – 5 species (all in Patagonia, South America)
- Subgenus: *Brassospora* or *Trisyngyne* – 20 species

Peter Brian Heenan and Rob D. Smitsen proposed splitting the main genus (*Nothofagus*) into these four subgenera, but keeping the South America's species as *Nothofagus*, but this was not accepted at the World Checklist of Selected Plant Families (Royal Botanic Gardens in Kew). (I will use the Heenan-Smitsen names for the New Zealand species). Interesting to note that 33 species of *Nothofagus* are already listed as extinct.

As mentioned there are five species of southern beech trees in New Zealand. 25% of New Zealand is covered in native forest (about 6.4 million ha). Of them (4 million ha) have some beeches in the forests, and ½ (2 million ha) is only just beeches.

Generally the forests in New Zealand are classified as beech forests, Podocarp broadleaved forests and Kauri-podocarp-broadleaved forests. They are all classified as Temperate rain forests. These are wet and cold forests, with an annual precipitation of 3500 to 4000 mm. This fact results in massive trees. Temperate rain forests (in comparison to Tropical rain forests) only occur in New Zealand, mostly Tasmania and south-eastern Australia, Patagonia (southern Argentina and Chile), north-western United States (Olympic National Park, in Washington State), western British Columbia (Canada) and southeast Alaska.

I was most fortunate to visit a large part of these forests, including the tropical, equatorial rain forests, and want to concentrate in this article on the beech forests of New Zealand.

A large part of the beech forests of New Zealand occur on South Island, mostly around Te Anau – Hollyford – Milford Sound – Fiordland, Haast Pass, Arthur's Pass, Lewis Pass and some on North Island.





Beech distribution in New Zealand

Beeches, mostly *Fuscopora* (previously known as *Nothofagus*, see comment above*) is divided into two groups, one with serrated leaf margins, and one with entire leaf margins.

DISTINGUISHING FEATURES

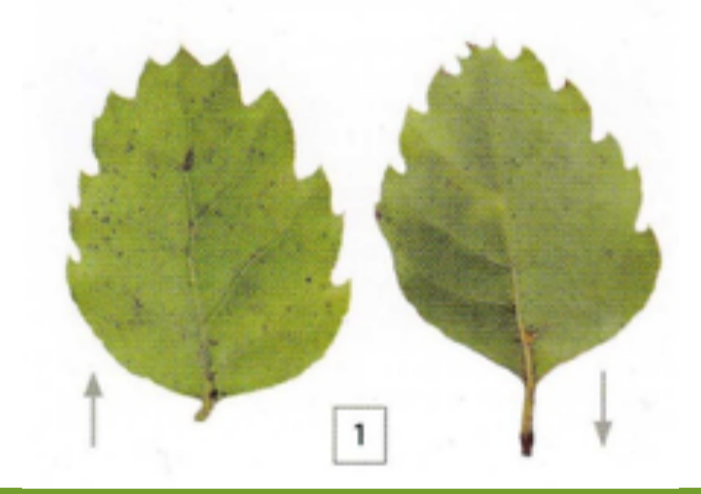
- Leaves have 3–4 pairs of secondary veins.
- Domatia are present in axils of leaf veins on the underside.
- Marginal teeth: 6–8 on each side, long, pointed and strongly curving towards the leaf tip.

Fuscopora fusca



Beech Forest

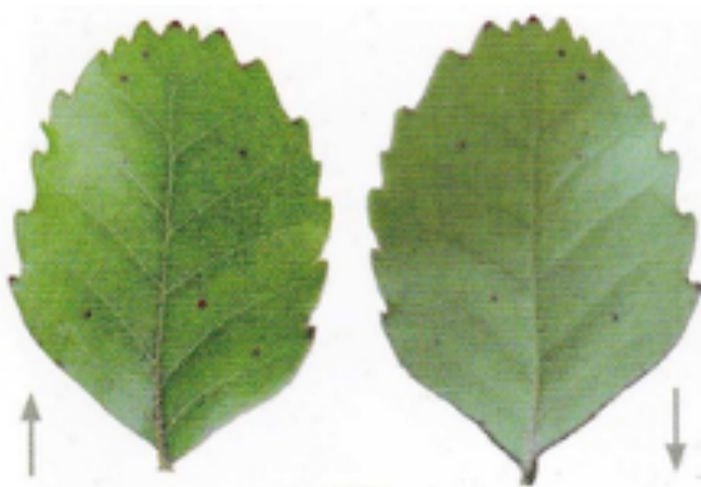
The serrated leaf species are the red beech (*Fuscopora fusca*), locally known as tawhairaunui, common in the wet mountainous regions; and the hard beech (*Fuscopora truncata*), mostly on Northland, North Island and the northern parts of South Island.



DISTINGUISHING FEATURES

- Leaves have 5–6 pairs of secondary veins.
- Leaves lack domatia.
- Marginal teeth: 8–12 each side, blunt and uncurved.

Fuscopora truncata

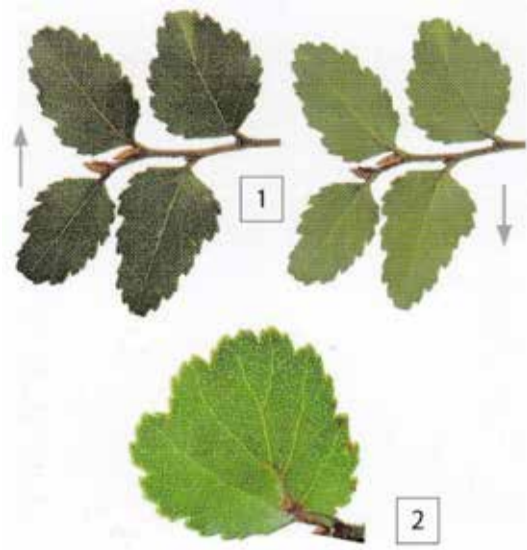


The silver beech (*Lophozonia menziesii*), locally known as tawhai, is common in wet mountainous areas of

both North and South Islands. The silver beech has smaller leaves, with serrated leaf margins.

DISTINGUISHING FEATURES

- Trunk doesn't have sooty mould.
- Leaves are smaller than *Fuscospora fusca* and *F. truncata*, with double, blunt-ended marginal teeth.
- The only native beech that may support beech strawberry fungus.



Lophozonia menziesii

The entire leaf species are the mountain beech (*Fuscospora cliffortioides*), locally known as tawhairauriki, common at high altitudes from

Coromandel on North Island to South Island; and the black beech (*Fuscospora solandri*), with the same difficult Maori name, common at lower altitudes.

DISTINGUISHING FEATURES

- Found in upland habitats.
- Leaves are narrowed to the tip, not toothed.



Fuscospora truncata

DISTINGUISHING FEATURES

- Found in lowland habitats.
- Leaves are rounded at the tips and not toothed.



Fuscospora solandri

The wet and wild West Coast of South Island, New Zealand, is connected to the eastern part of South Island by three mountain passes, namely Haast Pass, Arthur's Pass and Lewis Pass. The coast is filled with lakes and large glaciers, fast-flowing rivers and virgin rain forests. The rainfall at Franz Josef Glacier is 5092 mm per annum.

The principal towns are Greymouth and Westport. There is a railway connection between Greymouth and Christchurch. In the deep south is Westland Tai Poutini (and Fiordland) as well as Mount Aspiring National Parks. In the north is the very scenic Paparoa National Park and Victoria Forest Park.



Haast Pass



Beech Rain Forest in Haast Pass

The main west-east pass on South Island is Arthur's Pass, a beautiful pass with a tar road and large viaduct at death's corner. I spent long hours exploring the forests in intermittent, pouring rain – I do not believe in the average visitor's outlook of *veni, vidi, vici* ... you cannot just walk from Point A to Point B without learning your surroundings! Conservation is knowledge.

The western side of Arthur's Pass is covered with Podocarp-broadleaved forest, replaced by alpine vegetation at the top of the pass. Even the magnificent New Zealand tree ferns (*Cyathea* and *Dicksonia* species) are rare on top of the pass.

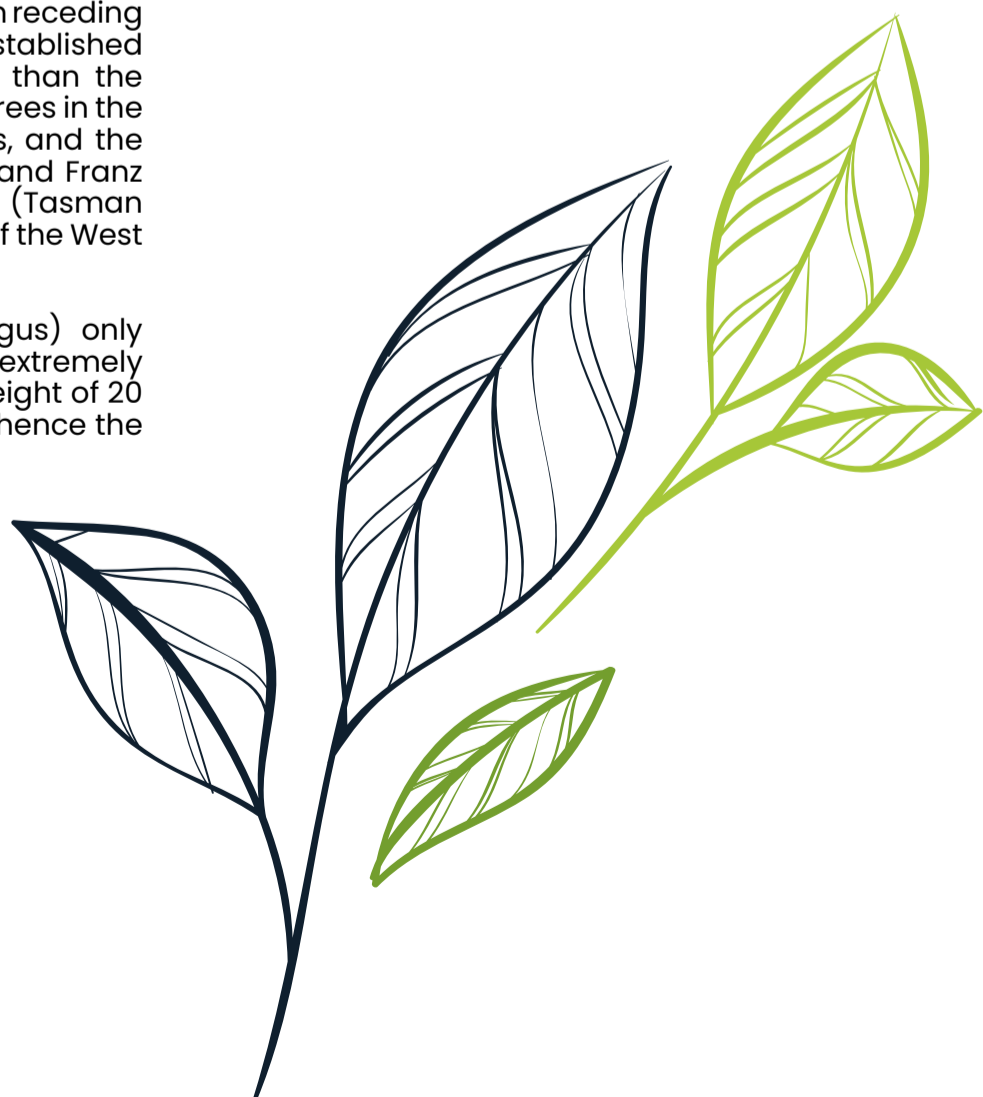
The eastern side of Arthur's Pass is again purely covered with beech forests, without any tree ferns. There are no broadleaved forests on the eastern side. The most common beech is the mountain beech (*Fuscospora cliffortioides*). Lewis Pass is situated further north, with a similar composition of beech species.

Very prominent on the central of the West Coast of South Island, New Zealand, is the so-called Beech Gap. The reason for this is found in the last Ice Age. During the last Ice Age all the trees and vegetation were destroyed and covered by glaciers. As the planet warmed up (and is still warming globally) with receding glaciers, the dominating podocarp trees established themselves first because they grow faster than the beech trees, hence the reason for no beech trees in the glacier region (Fox and Franz Josef glaciers, and the glaciers east of Mount Cook). Both the Fox and Franz Josef glaciers were connected to the ocean (Tasman Sea), 18 000 years ago, and the central part of the West Coast region was covered with ice!

The beech trees (*Fuscospora* or *Nothofagus*) only produce seed every 3 to 5 years, and grow extremely slowly. Seedlings take 20 years to reach a height of 20 cm! The podocarps dominate the beeches, hence the reason for the Beech Gap.



The general differences between *Cyathea* and *Dicksonia* tree ferns





An interesting picture at these two glaciers is the “growth of a forest”, depicting the floral history of Te Wahipounamu (the West Coast)

The pioneer plants established themselves first as the glaciers started retreating, very visible at both Fox and Franz Josef glaciers today. These pioneers include lichens and mosses, followed by willow herbs, grasses and scab weeds (tutahuna). *Poa novae-zelandiae* and indigenous brooms started growing. It took the pioneers 8 years to establish themselves. Just walk from the terminal moraine of these glaciers towards the ocean, and you will see how the forests started growing!

These were followed by pioneer shrubs, 14 years since glacier receding, like the tree daisy (akeake), koromiko (*Veronica salicifolia* and *Veronica stricta*) and the tutu (*Coriaria arborea*). The tree daisies (Asteraceae) include the beautiful *Olearia* and *Brachyglottis* species.

The first ‘low’ forest started appearing 50 years after glacier retreating, with tree seedlings of kamahi (*Weinmannia racemosa*) and rata (*Metrosideros umbellata*). The main forest, consisting of these tree species, only established themselves 120 to 200 years after glacier retreating.



Massif *Podocarpus* forests near Ohakune

The real podocarp forests only become established 500 years after glacier retreating. These species are *Dacrydium cupressinum* (rimu), *Dacrycarpus dacrydioides* (kahikatea), *Prumnopitys taxifolia* (matai), *Prumnopitys ferruginea* (miro), *Podocarpus totara* (totara), all of them existing canopy trees; and kamahi (*Weinmannia racemosa*) and rata (*Metrosideros umbellata*) as sub-canopy trees. Tree ferns, other ferns and mosses cover the forest floor.

There are more complex forests on North Island, New Zealand, to include the endangered kauri forests (*Agathis australis*) and other interesting conifers.

It is also interesting to follow the vegetation zones to the south-western side of the Turoa ski-field, Mount Ruapehu, on North Island, to summarize:

It starts with tall *Podocarpus* broad leaf forests, at the village of Ohakune, following the tar road (SH4) to the National Park Village.



Cordyline indivisa in the podocarp forests

The main components of the podocarp forests are *Dacrydium cupressinum*, *Dacrycarpus dacrydioides*, *Prumnopitys taxifolia* and *Prumnopitys ferruginea*. They form the canopy of the forest. The sub canopy consists of kamahi (*Weinmannia racemosa*) and black maire (*Nestegis cunninghamii*), with climbers, ferns and tree ferns. The mountain cabbage tree, *Cordyline indivisa*, is very prominent.

These podocarp forests occur only up to 1000 meters above sea-level. The next vegetation zone is the manuka-kanuka forest, consisting of *Leptospermum scoparium*, the tea tree (manuka), and *Kunzea ericoides* (kanuka). Both belongs to the Myrtaceae family, and can be difficult to separate in identification.

These two zones are followed by beech forest, firstly the red beech (*Fuscospora fusca*), secondly the silver beech (*Lophozonia menziesii*), and lastly by the mountain beech (*Fuscospora cliffortioides*) (old name: *Nothofagus solandri* var. *cliffortioides*) and black beech (*Fuscospora solandri*). The beeches stretch to the tree line at about 1530 meters above sea-level.

The beech forest are fairly uniform, but the canopy can be interrupted by kaikawaka, or mountain cedars (*Libocedrus plumosa*), and intermittent *Cordyline indivisa*, the largest 'lily' in the world.

Two semi-parasitic climbers decorate the mountain beeches with beautiful red flowers in Spring, namely *Peraxilla tetrapetala* and *Alepis flavida*, both from the Loranthaceae family, endemic in New Zealand. These climbers eventually destroy the beeches, but the invader possums (a pest in New Zealand) love these parasites, and therefor protects the beeches! Another pest under the beeches is the *Platypus* beetle, which sucks the stems of the beeches, causing them to die.



Beech forest

Beautiful orchids in these beech forests are *Corybas macranthus*, the spider orchid.

The next few vegetation zones are smaller beech forest-shrub land, tussock land (just known as tussocks) and the boulder field. These are alpine vegetation zones. Tussocks are special grasses in the *Chionochloa* family, especially the red tussock (*Chionochloa* sp.). Many other daisies, mosses and herbs occur, examples are the North Island edelweiss (*Leucogenes leontipodium*) and alpine flowers like *Ranunculus carsei*, *Parahebe hookeriana* and *Drosera arcturi*. These areas are covered with snow in the Winter. The boulder-, gravel- and stone fields are the highest alpine zones. The volcanic craters are filled with crater lakes. We also get swamps and bogs between the beeches in the beech vegetation zone.



Prominent beech forests at Waitonga Falls parking-area



Fuscospora solandri (black beech)



Alpine Vegetation

TO CONCLUDE:

Nothofagus do also occur in Tierra del Fuego (South America), the 'land of fire', especially *Nothofagus pumilio* (the lenga, or southern beech, as the local name), *Nothofagus dombeyi* (coihue, or evergreen

beech), *Nothofagus antarctica* (nire, or low deciduous beech), and *Nothofagus detuloides* (white beech). They are essentially part of temperate rain forests.

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PIONIERSJAG - 'n Dendrologiese perspektief

Dr Willie Barnard - Manketti-tak
(teorie komponent ter gedeeltelike voltooiing van die Dendroloog Vlak III eksamen)

Die 1885 jagekspedisie is 'n jaarlikse gebeurtenis, waar 'n groep jag- en kultuurentoesiaste met outydse gewere op 'n outydse manier jag. Vir 'n week woon hulle in die veld, en herleef die aktiwiteite in 'n jagkamp in 1885. Daar word geskiet met voorlaaiergewere, biltong word in die kamp gemaak en opgehang, Tente lyk soos die ou delwerstente wat rondom Kimberley opgeslaan was.

Hierdie jagters sê hulle gaan vir 'n week in die tydmasjien wat hulle terugvoer na 1885. Wapens wat gebruik word moet in 1885 reeds bestaan het, of replikas van sulke gewere. Kamptoerusting moet sover moontlik ook uit daardie era kom. Sels die jag metodes moet gevolg word, waar die jagters hulle trofee op hul rug terug dra kamp toe vir bewerking.

Daar word nie net gejag nie. Kampaktiwiteite sluit in: smee van messe, maak van velskoene, giet van koeëls, en brei van rieme. Dan natuurlik ook biltongsny en wors maak. Hierdie aktiwiteite gee vir ons 'n kykie in die lewe van ons pionier voorouers. Dit wys ons ook hoe hulle moes planne maak om met dit wat die natuur voorsien is, te kan klaarkom.

'n Dendrologiese perspektief

Bome het 'n belangrike rol gespeel om die noodsaaklike te voorsien in die lewens van ons voorouers, en op hierdie pionierjag ekspedisies word hierdie deel van ons geskiedenis weer lewendig.



JONG JAGTER BY OSSEWA - Antonie Minnaar
[Mondelinge toestemming van die kind se vader Hansie Minnaar om foto te plaas]



Tipiese oggend kamptoneel

Vuurmaakhout

Kom ek begin by die ooglopende: watter bome maak goeie vuurmaakhout? Geen kamp kan funksioneer sonder 'n kampvuur nie. Vuur word gebruik vir koffiewater kook, kosmaak, om stortwater en skottelgoed water warm maak, lood te smelt vir koeëls giet, en ysters warm te maak vir smeewerk.

Daar is gevind dat vir kookvure die sagter houtsoorte, soos vaalboom, huilboom en wildesering meer bruikbaar is. Vir braaikole moet die hout bietjie digter wees, hier werk sekelbos, swarthaak, knoppiesdoring en wag-'n-bietjiedoring (*Senegalia affra*) goed. Vir smeewerk sal net die digste swaarste hout soos rooibos, hardekool en kameeldoring deug, en die vuur moet natuurlik met 'n blaasbalk aangejaag word.

Vir die smelt van yster, volgens my bronne, is dit net sebrahout (*Dalbergia melanoxylon*) wat warm genoeg brand. (Ek was nog nooit in 'n situasie waar sebrahout so volop is dat dit as brandhout gebruik is nie! - Dit klink na heiligskenis!)

Skuiling en skaduwee

Bome voorsien skuiling en skaduwee vir ons tente, asook ophangplek vir die vleis. In die bosveld, kan daar selfs in die jageisoen baie warm dae wees, dan is dit beter dat jou tent onder 'n boom is. Nog belangriker, vleis van die wild wat gejag is moet in die koelte hang. Wanneer 'n groot karkas, soos 'n blouwildebees aan 'n boom gehang word vir slagdoeleindes, moet die takke hoog genoeg en sterk genoeg wees vir die doel.

Bome wat in Mei maand nog koelte gee, sluit in huilboom, (*Peltophorum africanum*), kameeldoring (*Vachellia erioloba*), olienhout (*Olea europea* subsp. *africana*), witgat (*Boscia albitrunca*) asook boekenhout (*Faurea saligna*).

Kampgereedskap en toerusting

Bome en ander plante is tradisioneel gebruik om verskeie soorte kampgereedskap en toerusting van te maak. 'n Paar voorbeelde van hierdie gebruike is:

Bosveldbloubos (*Diospyros leucoides* subsp. *guerkei*)

'n Takkie van die bosveldbloubos, word met 'n hamer of knuppel op 'n klip geslaan dat die vesels uitrafel. Die takkie word dan as 'n tandeborsel gebruik. Wit hardekoolas gemeng met tafelsout maak 'n goeie tandepasta. Dikker takke van die bosveldbloubos kan op dieselfde manier voorberei word om 'n skropborsel vir ysterpotte te maak.

Bobbejaanstert (*Xerophyta retinervis*). 'n Stingel van die plant, se proksimale einde word uitgerafel om as handbesem te dien.

Kierieklapper (*Combretum hereroense*)

Die bitterhoutjie (hefboom) van die handpomp wat water aan die kamp voorsien het gebreek. Niks beter as om kierieklakker te gebruik om 'n nuwe bitterhoutjie te maak nie!

Bosveldsaffraan (*Eleaodendron transvaalense*)

Een van die kamplede het 'n pragtige papelepel gekerf uit bosveldsaffraan. Onthou die boom behoort aan die CELASTRACEAE-familie en die boslepelhout (*Cassine peragua* subsp. *peragua*) en lepelhout (*C. schinoides*) wat in die Wes-Kaap voorkom, behoort aan dieselfde familie.

Die stampblok en stamper gereedskap wat tydens die kampe gebruik word is 'n familie-erfstuk wat onontbeerlik is vir die voorbereiding van koffiesubstitute in die kamp. Die blok is vermoedelik maroela (*Sclerocarya birrea* subsp. *affra*), en die stamper skurweblaarbos (*Ehretia amoena*).



HANDPOMP met sy kierieklapperhefboom onder die tambotiebome



Hier hang 'n waterbukkarkas aan 'n pragtige boekenhoutboom in die kamp



Johan Greyling besig om 'n besem te maak van bobbejaanstert



Blok en stamper. Witgatwortels (*Boscia albitrunca*) word in die stamper gemaal vir koffie

Koffiesubstitute

Koffie is altyd belangrik in 'n jagkamp en vroegoggendkoffie se ritueel is soos volg:

Die persoon wat eerste opstaan (gewoonlik so 2 ure voor sonop), kry die vuur aan die gang van gisteraand se gloeiende kole. 'n Ketel word oorgehang. Dan word geroosterde koffiebene in die koffiemeule gemaal en in die koffiesakkie in die ketel gesit. Dan kom die jagters so een-een by die vuur aan en drink hulle oggendkoffie by die gloed van die vuur.

Maar hoe gemaak as die voorraad koffiebene uitgeput is? Dit is 'n vraag waarop ons voorouers dikwels moes antwoord.

Die bekendste koffiesubstituut is waarskynlik die wortels van die witgatboom (*Boscia albitrunca*). Die wortels word uitgegrawe, in stukkie gekerf en in die son gedroog. Die stukkie wortel word op 'n braaiplaat gebrand, soos koffiebene, en dan in die stampblok gemaal. Hierdie "koffiemoer" word in 'n koffiesakkie in die ketel gesit en laat trek net soos koffie. Die jagters se kommentaar op die witgatkoffie was meestal positief, maar Johan, wat gewoonlik sy koffie bitter drink het gesê dat dit te soet is vir hom.

'n Ander koffie wat ons probeer het, was gemaak van die pitte van die kameeldoring, (*Vachellia erioloba*). Die peule word in die stampblok gebreek, en die pitte met die hand uitgesoek. Die pitte word soos koffiebene gebrand, en in die koffiemeule gemaal. Hierdie moer word dan net soos koffie getrek. Kommentaar was dat dit heel smaaklik is, en 'n interessante springmielie smaak het!

'n Vorige jaar het ons koffie gemaak van die sade van die toepaslik benaamde koffiebauhinia (*Bauhinia petersiana*). Hierdie koffie word net soos die kameeldoringkoffie voorberei. Hierdie struik kom in die sandveld wes van Ellisras (Lephalale) voor, en moet spesifiek in Maart ge-oes word, voordat die peule aan die boom oopspring. Ongelukkig het nie een van die jagters hierdie jaar vroegtydig by die oes uitgekom nie. Hierdie koffie is baie lekker, maar daar is nie elke jaar so 'n goeie oes nie.

Medisinale gebruike van plante

Daar is baie medisinale toepassings van plantdele wat deeglik beskryf is. Wanneer mens hiermee wil eksperimenteer, is versigtigheid die wagwoord. Daar is twee plante waarvan die jagters wel dele daarvan as medikasie gebruik het.



Wildesering stompe, na hulle eerste draai op die groot draaibank



Laventelkoorsbessie se blare word gekerf, om in die ketel getrek te word as medisyne

'n Treksel van die gekookte blare en blommetjies van die koorsbossie (koorstee), (*Lippia javanica*) is met sukses teen hoofpyn gebruik.

Die aftreksel van gekookte blare van die laventelkoorsbessie (*Croton gratissimus* var. *gratissimus*) is al deur een van die jong jagters suksesvol gebruik in die behandeling van sinusitis. Volgens die jongman het hy rapporteer dat hy beter voel, maar dit is moontlik dat hy bang was hy kry dalk nog van die mengsel om te drink!

Die ossewa

Die ossewa het 'n sentrale rol gespeel in die pionierslewe van toentertyd. Nie net tydens die Groot Trek nie, maar ook in die daaglikse lewe op die plaas en in die veld. Die pionierjagters is bevoorreg om in hul geledere 'n wamaker te hê, wat ervare is in die ambag van wamaak. Voor die Groot Trek, was wamakers bekend met die beskikbare houtsoorte, inheems aan die destydse Kaapkolonie, wat geskik was om waens van te bou. Verskillende dele van die wa stel verskillende eise, en daarom is verskillende houtsoorte aan die wa gebruik.

Toe die Voortrekkers die binneland intrek, moes hulle leer om van die ander spesies bome in hulle nuwe tuiste, geskikte hout te kry vir die maak van wa-onderdele. Ek het by Hans Nel, wamaker gaan kers oosteek oor die houtsoorte wat gebruik word by die bou van ossewaens. (Die verskillende houtsoorte gebruik vir die ossewa verdien 'n artikel in eie reg).

Ek wil hier net noem dat die wamakers van die Kaapkolonie in die binneland 'n houtsoort ontdek het wat ideaal is vir die maak van wa-nawe. So gesog was hierdie hout, dat die Kaapse wamakers later vragte hiervan uit die binneland gebring het. Ek praat van ons beskeie wilde sering (*Burkea africana*). Kabinetmakers wat die hout gebruik het, rapporteer dat dit moeilik werk a.g.v. die dwarsdradigheid. Dit is hierdie einste dwarsdradigheid wat dit so geskik maak vir wa-nawe. Dit bring mee dat die naaf kragte in alle rigtings kan absorber, soos die wawiel vorentoe rol en die krag deur die speke aan die naaf oorgedra word.

Dit is goed om te weet dat die wildesering geskik is vir wa-makery, maar in die praktyk is dit 'n 'n hele proses om die hout in wa-nawe te omskep. Dit is tydens hierdie Pioniersjagekspedisies dat dit duidelik gemaak word hoeveel ons voorvaders van die natuur afhanklik was om hul daaglikse take te doen. Deesdae is ons geneig om die nuttige aspek van bome oor die hoof te sien en bloot hul skoonheid te bewonder. Ek sou voorstel dat enige boomliefhebber in Suid-Afrika 'n naweek moet neem om terug te reis in tyd in met die tydmasjien na 1885 om die praktiese toepassing van ons wonderlike inheemse natuur ten volle te ervaar en te waardeer. Indien u belangstel om hierdie unieke geleentheid te ervaar kontak Willie Barnard geo@lantic.co.za

CHANGES TO THE LIST OF SOUTHERN AFRICAN INDIGENOUS TREES

Dr T Morgenthal (Convener of the Tree Name Committee), SP Bester & RR Klopper

A comprehensive dictionary of common names was published by van Wyk *et al.* (2011), which can be used as the terms of reference for vernacular names in Afrikaans and English. The publication also offers a detailed account of regional vernacular names in various other languages. The latest printed version of *The List of Southern African Indigenous Trees* appeared in 2014 (Von Dürkheim *et al.*, 2014). Since then, significant changes in scientific names have occurred. These changes were published in two articles in 2021 and 2022 in *Dendron*, the official publication of the Dendrological Society of South Africa (Von Dürkheim, 2021; Tree Names Committee of the Dendrological Society, 2022).

Following a vote by members of the Dendrological Society, it was decided to discontinue the use of the national tree numbers from the *Flora of South Africa*. This decision is due to substantial taxonomic changes at both order and family level. For example, the former Flacourtiaceae family, a large polyphyletic group initially classified under the order Violales, was recently restructured into several families within the order Malpighiales according to the APG IV system (The Angiosperm Phylogeny Group, 2016). Genera from the original Flacourtiaceae are now grouped with trees associated with plant families with tree numbers below 100, whereas their original range was between 491 and 512. The addition of new numbers for taxonomic updates further complicates the list.

Due to prohibitive costs, the publication of a new list has been deemed unfeasible for now. Consequently, any changes and additions to *The List of Southern African Indigenous Trees* will be published in *Dendron*, in future. This report details recent updates in scientific names from Kew's *Plants of the World Online* (POWO, 2024) and the *World Checklist of Vascular Plants* (WCVP) by Govaerts (2024). Although changes to scientific names continue to be published, they require verification to confirm their acceptance, a process discussed on the POWO website.

The Dendrological Society and the Dendrological Foundation's long-established role in recording vernacular names is well documented (Van Wyk *et al.*, 2011), tracing back to Von Breitenbach's *The List of Southern African Indigenous Trees* (Von Breitenbach, 1965). A standardised list of vernacular names was first proposed by Von Breitenbach (1974), and by the time the Dendrological Foundation was established, a standard list of tree names had been developed and was published in the first *Pocket List* in 1986 (Von Breitenbach, 1986).

The widely distributed third version, published in 1995, included 1 073 species (including infraspecific taxa), spanning 97 families and 370 genera. The introduction to the third version (Von Breitenbach, 1995) provides a historical account of the origins of *The List of Southern African Indigenous Trees*. Since its inception in 1986, the vernacular names in *The List of Southern African Indigenous Trees* remained largely consistent, although some names have changed due to taxonomic changes, new species descriptions, or the need to replace offensive terms.

The International Code of Nomenclature, the current version being the *Shenzhen Code* (Turland *et al.*, 2018), which will be replaced by the *Madrid Code* in 2025, for algae, fungi, and plants (ICN) [loosely referred to as *The Code*] regulates the application of scientific names. In contrast, vernacular names develop naturally within societies, often varying by region, language or ethnicity and different names may exist for a specific plant species or group of plants. Standardising these names helps to reduce confusion. Standardising is not unique to the Dendrological Society but has also been observed, for example, in the global ornithological community. Nonetheless, culturally significant vernacular names should be preserved. Although only a few common or culturally and economically significant species have widely recognised vernacular names, trees in South Africa typically have names within different communities. Within African culture subtle taxonomic differences are not recognized and visually similar species will often have the same vernacular name. Newly described or rare species often lack universally recognized vernacular names. The need exists to continuously develop and find socially accepted vernacular names.

To address these needs, the Dendrological Society has established a Tree Naming Committee, guided by principles published by Van Wyk *et al.* (2011), to record but also to standardise vernacular names for newly identified species. While vernacular names enhance accessibility and enjoyment for enthusiasts, the only universally recognised names remain the scientific ones. As many experienced amateur botanists will attest, learning scientific names becomes more intuitive with time, much like learning personal names. Like a person's name and surname a tree's scientific name provides insights into its phylogenetic relationship and shared characteristics to other related species.

Herewith a record of changes since the last update by the Tree Naming Committee (2022) to *The List of Southern African Indigenous Trees*.

UPDATES IN SPECIES STATUS

Maytenus deflexa is now regarded as a synonym of *Maytenus undata*.

Tricalysia: *Tricalysia galpinii* and *Tricalysia capensis* taxonomic status has changes to varieties of *Tricalysia capensis* (see further details for identification).

PROPOSAL TO REMOVE INAPPROPRIATE EPITHETS

Smith and Figueiredo (2021) proposed the permanent and retroactive removal of certain epithets containing *cafer* / *caffer*, *cafferiana*, *cafra* / *caffra*, *caffraria*, *caffrorum* and *caffrum* due to their offensive origins. The suggestion was that all species with these epithets in their scientific name be treated as orthographical variants (similar to “spelling errors”) by removing the “c” and second “f”, where relevant. The proposal, was accepted by the Nomenclature Section of the 20th International Botanical Congress (Madrid, July 2024) and the decision was ratified by the final plenary session of the congress, after which it came into

effect immediately. The resulting changes are already reflected in the POWO and WCVF databases, as well as the updated *List of Southern African Indigenous Trees*. In total, the scientific names of 23 tree taxa within *The List of Southern African Indigenous Trees* were amended. The Dendrological Society have removed related offensive or derogative vernacular names from their list within previous publications of *The List of Southern African Indigenous Trees* (Van Wyk *et al.*, 2011; Von Dürckheim *et al.*, 2014; Von Dürckheim, 2021; Tree Names Committee of the Dendrological Society, 2022).

CHANGES IN SCIENTIFIC NAMES

The following is an account of known changes since the update of *The List of Southern African Indigenous Trees* in 2022 by the Tree Names Committee of the Dendrological Society (2022) in *Dendron*.

Carissa spinarum: *Carissa edulis* is now regarded a synonym of *Carissa spinarum*.

Cyanthillium wollastonii: Considerable changes in the genera *Vernonia* took place, although 336 *Vernonia* species are still accepted. Most *Vernonia* species with a tree habit in South Africa have been renamed under the genus *Gymnanthemum*, *Orbivestus* (*Orbivestus cinerascens*), *Distephanus* and *Cyanthillium*. The accepted species for *Vernonia wollastonii* is now *Cyanthillium wollastonii* (Robinson *et al.*, 2016).

Entada: The genus *Elephantorrhiza* has been incorporated within the genus *Entada* (O'Donnell *et al.*, 2022).

Eugenia capensis: POWO and WCVF proposed significant changes in the treatment of *Eugenia natalitia*, *Eugenia simii*, and *Eugenia zeyheri*. Van Wyk and Boon (Prof AE Van Wyk pers. com, 2024) are, however, working on a taxonomic revision and description of new species in the Genus. The inclusion of, amongst others, *Eugenia zeyheri* as a subspecies of *Eugenia capensis* is also not supported by a molecular phylogenetic analysis of *Eugenia* by Van der Merwe *et al.* (2005).

Ficus: In the World Checklist of Vascular Plants (WCVF), *Ficus burkei* and *Ficus petersii* are considered synonyms within the *Ficus thonningii* complex. However, the Dendrological Society retains them as accepted species following Burrows and Burrows (2003).

Hippocratea: All species within the genus *Hippocratea* have been split into four very closely related genera. Only four species are accepted within the genus *Hippocratea*, none of which occurs within the southern African region.

- *Loeseneriella africana* var *richardiana* and *Loeseneriella crenata* are accepted taxa.
- *Pristimera delagoensis* var *delagoensis*, *Pristimera longipetiolata*, and *Pristimera peglerae* are accepted taxa.
- *Reissantia buchananii*, *Reissantia indica* var *orientalis* and *Reissantia parviflora* are accepted taxa.
- *Elachyptera pavifolia* is an accepted taxon.

Marijordaania filiformis: The new combination *Marijordaania filiformis* has been published for *Gymnosporia filiformis* in a new monotypic genus (Van Wyk & Boon, 2024).

Neocussonia: *Schefflera umbellifera* was changed to *Neocussonia umbellifera*. The genus *Neocussonia* is limited to southern and southeastern Africa, and Madagascar while *Schefflera* is confined to the island of New Zealand, Samoa Vanuato, Fiji, and New Caledonia (Lowry *et al.*, 2017).

Microcos: The synonymised genus *Microcos* has been

reinstated from *Grewia* (Czarnecka *et al.* 2006). *Grewia microthyrsa* name therefore is updated to *Microcos microthyrsa*, No other species in the genus *Grewia* in Southern Africa are affected.

Noronhia: Species previously under the genus *Chionanthus* within Africa have been incorporated within the genus *Noronhia* (Hong-Wa & Besnard, 2013). *Chionanthus* is now confined to the Americas and Southeast Asia, while *Noronhia* is an exclusive African and Malagasy genus.

Olea europaea: Bernard *et al.* (2024) has reinstated *Olea europaea* subsp. *africana* as a subspecies of *Olea europaea*. Seven subspecies are recognised by WCVF (Govaerts, 2024). Subspecies *cerasiformis* distribution is limited to the island of Madeira, subspecies *guanchica* is limited to the Canary Islands, subspecies *laperrinei* is native to the Sahara Desert (Algeria, Niger & Sudan) and subspecies *maroccana* is limited to the southern Atlas Mountains in Morocco. Subspecies *europaea*, the olive, has an original distribution around the Mediterranean Sea. Subspecies *cuspidata* distribution stretches from the Arabian Peninsula, Persian region, Southern Himalayas, and south-central China. Subspecies *africana* distribution is limited to Central East Africa and Southern Africa, from around Sudan and Somalia southwards.

Olinia huillensis: *Olinia rochetiana* is misapplied in South Africa (Sebola & Balkwill, 2009). *Olinia huillensis*, which was thought to only occur in Angola, has a much wider distribution in Southern Africa. *Olinia huillensis* has also been divided into three subspecies of which two occur in South Africa (see discussion below).

Pseudophyllanthus: The species *Andrachne ovalis* has been reclassified in a monotypic genus as *Pseudophyllanthus ovalis*. The genus *Andrachne* thus no longer occurs in southern Africa (Vorontsova & Hoffmann, 2008).

Psoralea: The genus *Otholobium* has been incorporated into *Psoralea* (Bello *et al.*, 2022).

Psydrax species: The following species names within the genus *Psydrax* have been grammatically corrected: The specific epithet ending changes from “-a” to “-us” due to misapplication of gender endings.
Psydrax livida becomes *Psydrax lividus*
Psydrax fragrantissima becomes *Psydrax fragrantissimus*
Psydrax obovata subsp. *obovata* becomes *Psydrax obovatus* subsp. *obovatus*
Psydrax obovata subsp. *elliptica* becomes *Psydrax obovatus* subsp. *ellipticus*

Scepocarpus: The genus *Scepocarpus* was resurrected for Afrotropical nettle taxa, with *Urera* now regarded as only Neotropical. The name for *Urera trinervis* has thus been changed to *Scepocarpus trinervis* (Wells *et al.*, 2021).

Sesamothamnus leistneri: *Sesamothamnus leistneri* is a new species described by Swanepoel and Van Wyk (2023) and is confined to the Kunene River Valley, Kaokoveld, in Namibia and Angola.

Sylvainia. The species *Cephalanthus natalensis* is now treated in a new monotypic genus as *Sylvainia natalensis*. The genus *Cephalanthus*, however, remains valid with five described species occurring in the America's and southern Asia (Romero *et al.*, 2023).

Terminalia: The genus *Pteleopsis* have been incorporated into the genus *Terminalia* (Maurin *et al.*, 2017).

Thespesia: *Azanza* and *Thespesia* is now regarded as separate genera (Areces-Berazain & Ackerman, 2016). *Azanza garckeana* is therefore now *Thespesia garckeana*. The genus *Azanza* is now confined to Southeast Asia-Oceania.

Tricalysia capensis: The following varieties are now recognized under *Tricalysia capensis*:

<i>Tricalysia capensis</i>		
1	Tufted domatia absent or few, Eastern Escarpment (Limpopo, Mpumalanga and Swaziland). Schmidt <i>et al.</i> (2004) indicate that leaves are thickly leathery and held upright. Habitat is mostly rocky outcrops in grassland	var. <i>galpinii</i>
	Tufted domatia abundant Habitat mostly understory of forest or forest margins	2
2	Leaf blades less than 2 times longer than wider, leaves oblanceolate (widest part on the upper part of the leaf), associated with Indian Ocean Coastal Belt and immediate interior (Eastern Cape and KwaZulu-Natal).	var. <i>capensis</i>
	Leaf blades more than 3 times longer than wider, leaves more lanceolate, Distribution Eastern Escarpment (Limpopo, Mpumalanga and Swaziland).	var. <i>transvaalensis</i>

Note: *Empogona* and *Tricalysia* are notoriously difficult to distinguish. Differentiating characteristics is mainly associated with flower morphology. The fruit of *Empogona* is mostly black whereas the fruit of *Tricalysia* is red when ripe.

Vangueria: All species within the genera *Pachystigma* and *Lagynias* have been incorporated under *Vangueria* (Lantz & Bremer, 2005).

Vepris: All species within the genera *Oricia*, *Toddalliopsis* and *Teclea* have been incorporated under the genus *Vepris* (Morton, 2017).

Xylopi gracilipes: *Xylopi parviflora* is misapplied in South Africa. Studies on the plants belonging to the genus *Xylopi* has shown that the South Africa plant populations does not belong to *Xylopi holtzii* (*Xylopi parviflora*) but is better described by *Xylopi gracilipes* (Johnson and Murray, 2018).



PROPOSALS TO ADD NEW SPECIES TO THE LIST OF INDIGENOUS NAMES

Euclea polyandra, baviaanskersghwarrie, baviaan candle guarri
Euclea polyandra, a woody shrub growing in the Fynbos Biome as far east as Olifantskop pass near Patensie, is herewith included into the *List of Southern African Indigenous Trees*. The name baviaan is a Khoikhoi name for baboon. The shrub is endemic to the Western Cape and Eastern Cape.

Olinia huillensis rotshardepeer, rock hardpear
Olinia huillensis was divided into three subspecies of which two occur in South Africa. The original vernacular name for *Olinia huillensis* is rock hardpear or rotshardepeer. The three known subspecies needed vernacular names and therefore the original name was retained but by appending a vernacular name that describes the habitat or geographical distribution.

Olinia huillensis subsp. huillensis	rotshardepeer	rock hardpear
Olinia huillensis subsp. burttdavii	platorandrots- hardepeer	escarp rock hardpear
Olinia huillensis subsp. discolor	skeurvalleirots- hardpear	riftvalley rock hardpear



The following key was adapted from Sebola and Balkwill (2013) to distinguish the subspecies of *Olinia huillensis*. Further information can be found within the publication of Sebola and Balkwill (2013).

<i>Olinia huillensis</i>		
1	Slender trees up to 6m, branchlets slender, leaves papery, inflorescence axes and peduncle narrow and slender	subsp. <i>huillensis</i>
	Shrub, terminal branches short and thick, leaves leathery, inflorescence compact	2
2	Leaves obovate, apex distinctly notched with a mucro, concolorous, restricted to eastern escarpment around from around Lydenburg to Tzaneen	subsp. <i>burtdavii</i>
	Leaves broadly elliptic apex emarginate, discolorous, occurring in northeastern Malawi and southern Zambia	subsp. <i>discolor</i>

Olinia huillensis can be confused with *Olinia emarginata* but its leaves have secondary veins that are branching at an angle of 40° or less (shallower angle) from the midrib and loops once before the margin, tertiary net veining is not clearly visible on the upper surface. In contrast *Olinia huillensis* leaves have secondary veins that are branched at an angle of more than 40° from the midrib (more perpendicular) and loops more than once before the leaf margin, tertiary net veining is clearly visible on upper surface.

Tricalysia capensis* var. *transvaalensis
noordelike boskoffie, northern forest bush-coffee
Tricalysia capensis previously known as boskoffie or forest bush-coffee has been divided into three varieties. *Tricalysia capensis* var. *capensis* refers to the existing taxon which will retain the original vernacular name boskoffie / forest bush-coffee. *Tricalysia capensis* var. *galpinii* retains the original name for *Tricalysia galpinii*; klipboskoffie / rock bush-coffee. A newly described variety, *Tricalysia capensis* var. *transvaalensis* will be assigned the vernacular name noordelike boskoffie / northern forest bush-coffee.

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APPENDIX A: CHANGES TO THE LIST OF SOUTHERN AFRICAN INDIGENOUS TREES

Scientific Name	Name	English Name
Existing Woody Species Added to List		
<i>Euclea polyandra</i>	bobbejaankersghwarrie	baboon candle guarri
Changes in the Taxonomic Status of Species		
<i>Tricalysia capensis</i> var. <i>capensis</i>	boskoffie	bush-coffee
<i>Tricalysia capensis</i> var. <i>galpinii</i>	klipboskoffie	rock bush-coffee
Correcting Mis-applied Species in South Africa		
<i>Olinia huillensis</i> subsp. <i>huillensis</i>	rotshardepeer	rock hardpear
<i>Xylopia gracilipes</i>	bosrooivingers	forest redfingers
Grammatical Correction of Scientific Names		
<i>Combretum afrum</i>	Kaapse vaderlandsboswilg	Cape bushwillow
<i>Cordia afra</i>	septeeboom	septee-tree
<i>Dovyalis afra</i>	keiappel	Kei-apple
<i>Encephalartos afer</i>	Oos-Kaapse dwergbroodboom	Eastern Cape dwarf cycad
<i>Erica afra</i> var. <i>afra</i>	waterboomheide	water tree erica
<i>Erythrina afra</i>	Kaapse koraalboom	Cape coraltree
<i>Grewia afra</i>	rankrosyntjie	climbing raisin
<i>Harpephyllum afrum</i>	wildepruim	wildplum
<i>Jubaeopsis afra</i>	pondopalm	Pondo palm
<i>Maerua afra</i>	witbos	spiderbush
<i>Mimusops afra</i>	kusrooimelkhout	coastal red-milkwood
<i>Monanthes afra</i>	dwababessie	dwababerry
<i>Psoralea afra</i>	breëblaarvlieëkeurtjie	broad hookleaf-pea
<i>Protea afra</i> subsp. <i>afra</i>	gewone suikerbos	common sugarbush
<i>Protea afra</i> subsp. <i>falcata</i>	kromblaarsuikerbos	curved-leaf sugarbush
<i>Psydrax fragrantissimus</i>	tongakwar	Tonga quar
<i>Psydrax lividus</i>	groenkwar	green quar
<i>Psydrax obovatus</i> subsp. <i>ellipticus</i>	platokwar	plateau quar
<i>Psydrax obovatus</i> subsp. <i>obovatus</i>	kwar	quar
<i>Rauvolfia afra</i>	kinaboom	quininetree
<i>Sclerocarya birrea</i> subsp. <i>afra</i>	maroela	marula
<i>Senegalia afra</i>	wag- -bietjedorning	common hook thorn
<i>Tinospora afra</i>	kuswonderstok	coastal marvel-creeper
<i>Uvaria afra</i>	kleinvrugtrospeer	small-fruited clusterpear
<i>Ximenia afra</i> var. <i>afra</i>	suurpruim	sourplum
<i>Ximenia afra</i> var. <i>natalensis</i>	gladdesuurpruim	smooth-twigged sourplum
Newly Described Species Added		
<i>Marijordaania filiformis</i>	rooibloemvalssybas	red-flowered false silkybark
<i>Olinia huillensis</i> subsp. <i>burttdavii</i>	platorandrotshardepeer	escarp rock hardpear
<i>Olinia huillensis</i> subsp. <i>discolor</i>	skeurvalleirotshardepeer	riftvalley rock hardpear
<i>Sesamothamnus leistneri</i>	grootblaarsesambos	large-leaved sesamebush
<i>Tricalysia capensis</i> var. <i>transvaalensis</i>	noordelike boskoffie,	northern forest bush-coffee
Scientific Name Changes		
<i>Carissa spinarum</i>	ranknoemnoem	climbing numnum
<i>Cyanthillium wollastonii</i>	bosbloutee	forest blue-tea
<i>Loeseneriella africana</i> var. <i>richardiana</i>	rankspaanvrug	climbing paddlepod
<i>Loeseneriella crenata</i>	touspaanvrug	twine paddlepod
<i>Microcos microthyrsa</i>	sandrosyntjie	sand raisin
<i>Noronhia battiscombei</i>	waterpokysterhout	water pock-ironwood
<i>Noronhia foveolata</i> subsp. <i>foveolata</i>	pokysterhout	pock-ironwood

Scientific Name	Name	English Name
Scientific Name Changes – continue		
<i>Noronhia foveolata</i> subsp. major	bospokysterhout	forest pock-ironwood
<i>Noronhia foveolata</i> subsp. tomentella	Kaapse pokysterhout	Cape pock-ironwood
<i>Noronhia peglerae</i>	reusepokysterhout	giant pock-ironwood
<i>Olea europaea</i> subsp. africana	olienhout	wild olive
<i>Psoralea arborescens</i>	renosterveldvlieëkeurtjie	renosterveld hookleaf-pea
<i>Psoralea polysticta</i>	vlieër-vlieëkeurtjie	kite hookleaf-pea
<i>Psoralea spicata</i>	langaarvlieëkeurtjie	candle hookleaf-pea
<i>Psoralea wilmsii</i>	grasveldvlieëkeurtjie	grassland hookleaf-pea
<i>Pristimera delagoensis</i>	maputalandspaanvrug	Maputaland paddlepod
<i>Pristimera longipetiolata</i>	helikopterspaanvrug	helicopter paddlepod
<i>Pristimera peglerae</i>	bosspaanvrug	forest paddlepod
<i>Pseudophyllanthus ovalis</i>	valsbliksembos	false-lightningbush
<i>Reissantia buchananii</i>	fluweelblaarspaanvrug	velvet-leaved paddlepod
<i>Reissantia indica</i> var. orientalis	mopaniespaanvrug	mopane paddlepod
<i>Reissantia parviflora</i>	ribspaanvrug	ribbed paddlepod
<i>Scepcarpus trinervis</i>	boomranknetel	tree climbing-nettle
<i>Sylvainia natalensis</i>	witaarbeibos	strawberrybush
<i>Terminalia anisoptera</i>	stekelblaarstinkboswilg	spine-leaved stink-bushwillow
<i>Terminalia myrtifolia</i>	stinkboswilg	stink-bushwillow
<i>Thespesia garckeana</i>	slymappel	azanza
<i>Vangueria bowkeri</i>	boskroonmispel	forest crowned-medlar
<i>Vangueria dryadum</i>	bosveldslapmispel	bushveld pendent-medlar
<i>Vangueria lasiantha</i>	gladdeslapmispel	smooth pendent-medlar
<i>Vangueria macrocalyx</i>	kroonmispel	crowned-medlar
<i>Vangueria monteiroi</i>	duineslapmispel	dune pendent-medlar
<i>Vangueria triflora</i>	waterbergkroonmispel	Waterberg crowned-medlar
<i>Vepris bachmannii</i>	tweelingbessie	twinberry
<i>Vepris bremekampii</i>	wildenartjie	wild-mandarin

DISCUSSION AND CONCLUSION

Although the changes of plant names follow those of POWO and WCVF the following changes are, within the 2024 version of *The List of Southern African Indigenous Trees* **not** implemented:

- a) The WCVF (Govaerts, 2024) supports the inclusion of the genus *Morella* as a synonym of *Myrica*. Prof AE Van Wyk (pers. com, 2024), however, cautioned against the re-inclusion of the genus *Morella* in *Myrica*.
- b) Reinstating *Ficus thonningii* is not supported
- c) The inclusion of various *Eugenia* species as subspecies of *Eugenia capensis* is not supported.
- d) The inclusion of species of *Rapanea* under *Myrsine* is not supported.
- e) The inclusion of *Brachylaena rotundata*, and *Brachylaena transvaalensis* as varieties of *Brachylaena discolor* are, for now, not implemented. The resurrection of the variety *Brachylaena discolor* var. *mossambicensis* needs further investigation.
- f) The use of a hyphen for the specific epithet within the scientific name *Ficus burtt-davyi* needs reconsideration since it is discouraged in Art. 23.1 and 23.3 of the Code (Turland et al 2018). This will be clarified with the South African National Biodiversity Institute (SANBI).

The current list of indigenous tree species now comprises 1 694 taxa within 115 plant families. This update includes 26 grammatical corrections, 34 scientific name updates following POWO (2024) and recommendation to include five newly described taxa. Three changes in taxa status are recorded. Two tree species scientific names were found misapplied within Southern African flora. The taxonomic status of three species changed which led to one taxon not recognised as an accepted species and is therefore removed, while one woody species is added to *The List of Southern African Indigenous Trees*.

The Dendrological Society encourages members to report scientific names changes to the Tree Names Committee administration@dendro.co.za. A review is planned to include woody shrubs and lianas (woody creepers) especially if related species or subspecies are already included within *The List of Southern African Indigenous Trees*. A separate list for underground trees, suffrutex species with their existing vernacular names are planned. The working list of woody suffrutex species will be published in *Dendron*.

The National Register of Big Trees in South Africa® - Annual Report

Dr. Theunis Morgenthal

INTRODUCTION

The National Register of Big Trees in South Africa - NRB TSA® is a national initiative of the Dendrological Society to locate and record the biggest tree specimens with the aim of conserving indigenous tree heritage in South Africa. The register was established by Dr Fried von Breitenbach in 1981.

This report provides a current, annual account of the register's status. Basic statistics from specimens added during the reporting period from 2024-01-10 to 2025-01-09 are presented. A list of species, and the measurement details for the largest specimen for that species in the register are presented in Table 1.

BASIC STATISTICS CONCERNING THE DATABASE

The number of records in the NRB TSA® is 503 representing 142 species. During the reporting period 23 records were added to the register representing 15 species. The contributions were made by 7 people. Le Grange, W. was the biggest contributor to the register

during the reporting period. He contributed 8 specimen records to the database. The largest specimen added to the register during the reporting period was *Adansonia digitata* with a size index of **462.2**.

SIGNIFICANT SPECIES SURVEYED DURING THE PAST YEAR

Several noteworthy specimens were measured during 2024. The Sagole baobab (Madifha Tree) was remeasured. A magnificent shepherd's tree near Gamagara was added to the register. The largest nyala trees on the bank of the Limpopo near the

border barracks in the Mapungubwe National Park are also nominated as Champion trees. We are still looking for the biggest moepel in the Magaliesberg, but for now the biggest specimen grows on the farm Magatashoek.



Sagole baobab (Madifha Tree)

The Sagole Baobab with a stem girth of 33.9m, crown diameter of 38.1m, and tree height of 22.8m. The size index is calculated as 462. The tree was remeasured on 10 August 2024.



Gamagara Shepherd Tree

The Gamagara shepherd's tree with a stem girth of 4.7m, crown diameter of 18.8m, and height of 15.4m. The size index is calculated as 81.2m. The tree was remeasured on 11 April 2024.



Mapungubwe Barracks Nyala Trees

In the Mapungubwe National Park along the M11 river loop road at the old barracks a collection of large nyala trees occurs more or less of the same size. A particular specimen measured to be the largest.

The Mapungubwe Barracks Nyala tree with a combined stem girth of 8.9m, crown diameter of 34.6m and height of 28.5m. The size index is calculated as 284. The tree was measured on 12 August 2024.



Magatashoek moepel

The Magaliesberg is known for its beautiful moepel trees. The largest moepel so far measured is located on the farm Magatashoek on the southern slopes of the Magaliesberg near Rustenburg.

The Magatashoek moepel with a combined stem girth of 6.12, crown diameter of 23m and tree height of 13m. The size index is calculated as 87.7. The tree was measured on 25 November 2023.

SPECIES SIZE RECORDS

The list of measurements below per species also indicates the total number of specimens recorded. The table also shows the basic measurements for the largest specimen for each species measured and recorded in the NRBTSAs®.

Table 1. List of tree species and the biggest measurements associated for each species sorted based on size index within the NRBTSAs.

Scientific name	Measurements					Nr of specimens
	Trunk girth	Trunk diameter	Crown diameter	Tree height	Size Index	
<i>Adansonia digitata</i>	33.9	10.8	38.1	22.8	462.2	26
<i>Faidherbia albida</i>	11.1	3.5	36.5	34.3	389.1	14
<i>Ficus salicifolia</i>	16.8	5.3	56.0	22.0	380.1	1
<i>Afrocarpus falcatus</i>	8.7	2.8	33.6	39.0	376.4	18
<i>Breonadia salicina</i>	7.7	2.4	32.3	41.0	363.9	12
<i>Ficus sycomorus</i> subsp. <i>sycomorus</i>	11.8	3.8	39.4	29.7	361.0	12
<i>Senegalia galpinii</i>	9.5	3.0	41.0	30.0	333.3	10
<i>Cussonia spicata</i>	11.7	3.7	22.0	35.0	316.3	2
<i>Xanthocercis zambesiaca</i>	6.8	2.1	33.5	35.0	297.2	9
<i>Prunus africana</i>	5.8	1.8	28.9	40.0	290.9	4
<i>Ficus burkei</i>	10.4	3.3	31.9	28.0	287.6	10
<i>Diospyros mespiliformis</i>	6.8	2.2	36.5	28.2	250.7	14
<i>Ptaeroxylon obliquum</i>	4.0	1.3	22.7	45.0	243.4	1
<i>Ekebergia capensis</i>	7.7	2.5	30.2	27.3	234.9	13

Scientific name	Measurements					Nr of specimens
	Trunk girth	Trunk diameter	Crown diameter	Tree height	Size Index	
<i>Ficus ingens</i>	24.3	7.7	33.4	14.0	225.1	8
<i>Ficus cordata</i>	15.0	4.8	32.0	17.0	210.2	1
<i>Celtis africana</i>	4.6	1.5	19.7	39.0	209.9	3
<i>Ficus natalensis</i> subsp. <i>natalensis</i>	9.5	3.0	30.0	22.0	209.3	2
<i>Cussonia sphaerocephala</i>	6.3	2.0	22.1	30.0	200.3	5
<i>Vachellia xanthophloea</i>	4.3	1.4	33.2	27.4	184.1	2
<i>Ficus sansibarica</i> subsp. <i>sansibarica</i>	6.3	2.0	32.3	22.0	177.6	3
<i>Sclerocarya birrea</i> subsp. <i>afra</i>	4.6	1.4	34.5	24.0	169.6	13
<i>Ficus glumosa</i>	8.0	2.5	32.0	18.5	166.9	1
<i>Cordyla africana</i>	6.1	2.0	37.4	19.0	162.4	4
<i>Anthocleista grandiflora</i>	4.0	1.3	22.6	30.0	160.7	3
<i>Ficus polita</i> var. <i>polita</i>	3.9	1.2	26.8	27.0	155.7	1
<i>Newtonia hildebrandtii</i> var. <i>hildebrandtii</i>	7.1	2.3	26.2	18.0	138.8	31
<i>Combretum erythrophyllum</i>	5.2	1.6	28.2	20.0	136.4	2
<i>Combretum imberbe</i>	4.3	1.4	30.3	21.0	135.6	12
<i>Schotia brachypetala</i>	5.6	1.8	24.8	20.1	133.5	9
<i>Harpephyllum affrum</i>	3.8	1.2	18.5	28.0	133.0	2
<i>Albizia adianthifolia</i>	4.6	1.4	33.6	19.0	132.6	3
<i>Trichilia emetica</i> subsp. <i>emertica</i>	5.6	1.8	26.8	19.2	132.6	9
<i>Kigelia africana</i>	5.7	1.8	21.8	20.4	128.6	3
<i>Rauvolfia affra</i>	5.0	1.6	26.0	20.0	128.1	4
<i>Podocarpus henkelii</i>	4.5	1.4	19.1	24.0	125.4	1
<i>Ficus lutea</i>	7.5	2.4	32.0	14.0	122.2	1
<i>Trichilia dregeana</i>	4.1	1.3	21.5	22.0	116.7	1
<i>Brachylaena transvaalensis</i>	2.9	0.9	15.4	30.0	112.9	1
<i>Azelia quanzensis</i>	4.1	1.3	25.4	19.6	112.8	3
<i>Sideroxylon inerme</i> subsp. <i>inerme</i>	10.0	3.2	20.0	14.0	111.7	3
<i>Albizia forbesii</i>	3.3	1.0	22.0	23.1	110.7	1
<i>Phyllogeiton discolor</i>	3.7	1.2	22.3	21.0	107.8	2
<i>Erythrophleum lasianthum</i>	4.3	1.4	27.5	17.6	107.7	1
<i>Olinia radiata</i>	7.0	2.2	8.3	25.0	107.3	4
<i>Ziziphus mucronata</i>	3.2	1.0	20.7	22.5	103.5	3
<i>Senegalia burkei</i>	4.3	1.4	24.3	17.8	102.2	3
<i>Albizia versicolor</i>	4.0	1.3	24.9	18.0	101.2	5
<i>Guibourtia conjugata</i>	4.5	1.4	20.0	18.6	99.3	1
<i>Philenoptera violacea</i>	3.1	1.0	25.8	19.4	98.7	3
<i>Vachellia karroo</i>	2.5	0.8	15.6	27.0	94.2	1
<i>Kirkia acuminata</i>	4.0	1.3	21.2	18.0	93.0	6
<i>Spirostachys africana</i>	5.0	1.6	18.0	16.5	88.2	9
<i>Mimusops zeyheri</i>	6.2	2.0	23.1	13.0	87.7	9
<i>Ficus sur</i>	3.9	1.2	10.7	24.0	87.7	1
<i>Parinari curatellifolia</i>	3.2	1.0	18.5	20.0	87.2	3
<i>Colophospermum mopane</i>	4.1	1.3	16.9	18.6	87.2	4
<i>Dialium schlechteri</i>	6.5	2.1	22.8	12.7	87.0	2
<i>Scolopia mundii</i>	2.7	0.9	15.5	23.0	83.9	1
<i>Boscia albitrunca</i>	4.7	1.5	18.8	15.4	81.2	5
<i>Entandrophragma caudatum</i>	3.0	1.0	22.2	17.5	81.1	2
<i>Vachellia sieberiana</i> var. <i>woodii</i>	3.9	1.2	24.0	14.8	80.7	7
<i>Vachellia robusta</i> subsp. <i>clavigera</i>	2.4	0.8	22.0	19.6	79.6	2

Scientific name	Measurements					Nr of specimens
	Trunk girth	Trunk diameter	Crown diameter	Tree height	Size Index	
<i>Chaetachme aristata</i>	8.5	2.7	19.0	11.0	79.0	2
<i>Olea europaea</i> subsp. <i>africana</i>	4.8	1.5	20.3	14.0	78.4	12
<i>Noronhia peglerae</i>	2.0	0.6	9.6	32.0	78.1	1
<i>Vachellia erioloba</i>	5.9	1.9	24.7	11.3	77.1	3
<i>Vachellia tortilis</i> subsp. <i>heterocantha</i>	2.8	0.9	21.9	17.0	75.5	4
<i>Lannea schweinfurthii</i> var. <i>stuhlmanii</i>	3.5	1.1	25.1	14.0	73.5	2
<i>Vachellia hebeclada</i> subsp. <i>hebeclada</i>	6.1	1.9	55.6	7.0	72.5	1
<i>Senegalia nigrescens</i>	2.3	0.7	22.4	17.6	71.3	6
<i>Burkea africana</i>	3.0	0.9	23.5	15.0	70.8	1
<i>Pterocarpus rotundifolius</i> subsp. <i>rotundifolius</i>	3.7	1.2	18.8	15.0	70.3	3
<i>Schinziophyton rautanenii</i>	5.4	1.7	21.1	11.6	69.9	4
<i>Searsia chirindensis</i>	2.1	0.7	17.7	20.0	68.8	1
<i>Balanites maughamii</i>	2.6	0.8	15.6	18.5	67.0	5
<i>Mimusops affra</i>	2.6	0.8	16.8	18.0	66.7	1
<i>Nuxia congesta</i>	3.2	1.0	15.0	16.9	66.6	1
<i>Strychnos henningsii</i>	2.4	0.8	16.2	19.0	66.1	2
<i>Heteropyxis dehniae</i>	2.7	0.9	14.1	18.0	62.7	2
<i>Heteropyxis dehniae</i>	2.7	0.9	14.1	18.0	62.7	2
<i>Heteropyxis canescens</i>	1.9	0.6	6.8	30.0	60.5	1
<i>Cleistanthus schlechteri</i> var. <i>schlechteri</i>	2.8	0.9	14.8	15.9	58.0	2
<i>Olinia emarginata</i>	3.2	1.0	10.2	18.0	57.7	1
<i>Zanthoxylum davyi</i>	1.9	0.6	11.4	22.0	57.0	1
<i>Faurea saligna</i>	2.6	0.8	10.6	19.0	56.4	3
<i>Ilex mitis</i> var. <i>mitis</i>	1.0	0.3	15.0	25.0	54.6	1
<i>Pterocarpus angolensis</i>	2.0	0.6	18.6	15.6	52.9	4
<i>Peltophorum africanum</i>	2.2	0.7	16.2	15.6	52.6	3
<i>Strychnos decussata</i>	2.5	0.8	10.2	18.0	51.4	1
<i>Kirkia wilmsii</i>	2.4	0.8	12.3	16.6	50.8	3
<i>Combretum zeyheri</i>	2.9	0.9	14.6	13.1	48.2	2
<i>Searsia lancea</i>	4.0	1.3	16.2	10.5	48.0	1
<i>Pseudolachnostylis maprouneifolia</i> var. <i>glabra</i>	2.5	0.8	17.1	12.6	46.4	2
<i>Aloidendron barberae</i>	4.2	1.3	10.0	12.7	46.1	1
<i>Sterculia murex</i>	1.3	0.4	13.4	19.8	45.8	2
<i>Senegalia polyacantha</i> subsp. <i>campylacantha</i>	1.5	0.5	11.8	19.0	45.7	1
<i>Maerua angolensis</i>	2.5	0.8	14.2	13.3	44.5	2
<i>Lydenburgia cassinoides</i>	2.5	0.8	14.2	13.0	44.0	1
<i>Heteropyxis natalensis</i>	1.4	0.5	10.2	20.0	43.4	1
<i>Gymnosporia harveyana</i> subsp. <i>harveyana</i>	1.8	0.6	8.7	19.0	41.9	1
<i>Bolusanthus speciosus</i>	1.8	0.6	14.2	14.5	41.5	3
<i>Erythrina latissima</i>	3.5	1.1	14.8	10.0	40.3	1
<i>Phyllogeiton zeyheri</i>	1.6	0.5	11.6	16.0	39.5	3
<i>Searsia pyroides</i> var. <i>pyroides</i>	2.1	0.7	13.6	13.0	39.1	2
<i>Senegalia goetzei</i>	2.1	0.7	17.6	11.0	37.9	1
<i>Terminalia sericea</i>	1.7	0.5	18.3	12.0	37.8	1
<i>Warburgia salutaris</i>	1.8	0.6	12.5	13.5	35.7	1
<i>Elaeodendrum transvaalense</i>	2.2	0.7	12.9	11.0	33.1	2
<i>Croton megalobotrys</i>	1.7	0.5	10.7	13.2	31.7	1
<i>Albizia anthelmintica</i>	2.3	0.7	13.1	10.0	31.0	1
<i>Gardenia volkensii</i> subsp. <i>volkensii</i> var. <i>volkensii</i>	2.4	0.8	11.3	10.5	31.0	2

Scientific name	Measurements					Nr of specimens
	Trunk girth	Trunk diameter	Crown diameter	Tree height	Size Index	
<i>Leucosidea sericea</i>	2.3	0.7	10.3	11.2	30.6	1
<i>Noronhia foveolata</i> subsp. <i>foveolata</i>	1.1	0.4	9.3	16.0	29.4	1
<i>Ochna pulchra</i> subsp. <i>pulchra</i>	1.7	0.5	11.2	12.0	29.2	3
<i>Cussonia natalensis</i>	2.0	0.6	11.1	10.5	28.0	1
<i>Vachellia natalitia</i>	1.6	0.5	12.6	11.0	27.9	1
<i>Garcinia livingstonei</i>	1.6	0.5	10.2	12.0	27.4	2
<i>Combretum molle</i>	1.5	0.5	11.7	11.0	26.3	1
<i>Dalbergia melanoxylon</i>	1.7	0.5	11.5	10.4	26.0	2
<i>Erythrina lysistemon</i>	2.2	0.7	8.9	10.2	25.4	1
<i>Dovyalis zeyheri</i>	1.6	0.5	11.5	10.0	24.4	2
<i>Leucadendron argenteum</i>	1.6	0.5	6.1	13.0	23.1	1
<i>Dovyalis affra</i>	2.5	0.8	10.3	8.0	23.0	1
<i>Senegalia mellifera</i> subsp. <i>detinens</i>	1.4	0.4	14.9	8.8	22.7	1
<i>Sterculia rogersii</i>	1.9	0.6	10.4	8.9	22.5	2
<i>Phyllogeiton trachybasis</i>	1.2	0.4	11.8	10.2	21.9	1
<i>Combretum hereroense</i>	1.3	0.4	11.8	9.8	21.7	1
<i>Cassia abbreviata</i> subsp. <i>beareana</i>	1.5	0.5	12.2	8.9	21.6	1
<i>Wrightia natalensis</i>	1.2	0.4	5.7	13.1	19.6	1
<i>Androstachys johnsonii</i>	1.4	0.4	8.6	9.9	19.5	1
<i>Securidaca longepedunculata</i>	1.2	0.4	7.8	9.9	17.4	1
<i>Dichrostachys cinerea</i> subsp. <i>africana</i>	2.1	0.7	11.6	6.0	16.7	2
<i>Bauhinia galpinii</i>	0.9	0.3	8.8	9.4	15.4	1
<i>Schrebera alata</i>	1.0	0.3	6.9	10.0	15.1	1
<i>Diospyros lycioides</i> subsp. <i>sericea</i>	1.9	0.6	7.8	4.5	9.9	1
<i>Eugenia woodii</i>	0.7	0.2	4.4	9.0	8.8	1
<i>Gymnosporia buxifolia</i>	1.3	0.4	6.4	5.0	8.3	1
<i>Maerua afra</i>	1.2	0.4	6.0	5.0	7.5	1
<i>Aloe marlothii</i> subsp. <i>marlothii</i>	0.9	0.3	1.5	9.8	6.5	1
<i>Zanthoxylum capense</i>	0.4	0.1	3.3	7.1	4.4	1

Pilanesbergtak, Rustenburg

Henry Francis – Voorsitter Jaarverslag 2024

1. Ledesake

a. Ledetal

Daaristans 76 lede wat 53 gesinne verteenwoordig op ons ledelys (soos op 31 Oktober 2024).

Nuwe lede: Wilma Barret, Jan Steenekamp, Pieter Malan, Hermine Loots, Daleen Stickling, Gideon Wentink, James en Anina Breedt (oorplasing van Mankettitak), Ingrid en Walter Kolzing, Daniel Malan.

b. Takbestuur 2024

Voorsitter – Henry Francis
Sekretaris / Finansies – Clive Richter
Addisionele lid – Naas Grové
Beplanning en organisering van uitstappies – Dweenie Bester

c. Pilanesbergtak: Toekennings 2023

Familie trofee – Johan en Dweenie Bester
Grootboom trofee – Wikus Burger
Arbor Scientia (kennis) trofee – Bernd Wenhold

Toekennings vir 2024

Familie trofee – Jacob en Elmarie van Pairen
Grootboom trofee – Sarel van Wyk
Arbor Scientia (kennis) trofee – Hermine Loots en Wilma Barret
Boomgom trofee – Glen Haefele
Bokdrol spoeg trofee – Belinda Cornelius

d. Dendroloogboomkenniseksamens

Ons moedig lede aan om hul graad 1, 2 of 3 boomkennis eksamens te doen. Die volgende lede is tans besig met hul boomkennis eksamens:

Bernd Wenhold vlak II
Santa Wenhold vlak II
Clive Richter vlak II

Johan Bester het sy teoretiese en praktiese vlak II eksamens suksesvol afgeleë. Baie geluk.

2. Pilanesbergtak uitstappies 2024

a. 27 Januarie 2024 – Dag uitstappie na Twin Oaks. Die lede verken die terrein. Die uitstappie word

baie goed bygewoon (36 persone) en daar word lekker saam gekuier by Naas se huis na die tyd.

- b. 24 Februarie 2024 – Dag uitstappie na Jan Steenekamp se plaas op die Magaliesberg. 26 persone woon dit by en ons kuier heerlik na die tyd op die berg by Jan se huis.
- c. 21 – 24 Maart 2024 – Hierdie naweek uitstappie vind plaas op n plaas naby Tzaneen en by die ATKV Eiland oord. Lede van Magaliesstak en Pilanesbergtak woon die uitstappie by. Baie bome wat ons nie ken nie word hier gesien en geïdentifiseer. 7 lede woon dit by.
- d. 20 April 2024 – Die Dendrologiese Vereniging se Algemene Jaarvergadering vind plaas by Cycad World te Pretoria-Noord.
- e. 01 Mei 2024 – Die uitstappie vind op n publieke vakansie dag (Woensdag) plaas by Maretlwane naby Mooiooi. Dweenie Bester reël die uitstappie en 26 lede woon dit by.
- f. 22 Junie 2024 – Ons vervang ons aandbyeenkomste, as gevolg van gevaar op die paaie, na Saterdagoggend byeenkomste. Dankie aan Larry en Clive wat vir ons n lokaal by die Rustenburgse skougronde reël. Yvonne sorg vir heerlike sop voor die byeenkoms, dankie dit word waardeer. Die eerste byeenkoms word goed bygewoon en Naas lewer n praatjie oor die ontstaan, geologie en bome van die Vredefortkoepel. Na die tyd word daar lekker gebraaai. 20 Lede woon die byeenkoms by.
- g. 19 – 21 Julie 2024 – Naweek uitstappie na Leeupoort vakansiedorp. 8 Lede woon dit by. Verskeie groot bome word die naweek opgemeet. Sommige van die bome haal die Nasionale Grootboom Register as die grootste of naas grootste bome in Suid-Afrika.
- h. 17 Augustus 2024 – Die tweede oggend byeenkoms vind by die skougronde plaas. 14 lede woon dit by. Naas doen 'n aanbieding en n verduideliking oor die verskillende blaartipes. Die byeenkoms verdaag vroeg sodat almal kan gaan rugby kyk.
- i. 14 September 2024 – Dag uitstappie na Aasvoëlbad, naby Brits. Jacob en Elmarie van Pairen is ons gashere. Ons verken die plaas en kuier lekker saam na die tyd op hul stoep. 17 lede woon die dag by.
- j. September 2024 – Nasionale Boomplantmaand





- k. 26 Oktober 2024 – Dag uitstappie na Kranskloof in die Magaliesberg. 15 lede woon die uitstappie by en nuwe boom spesies word tot die bestaande boomlys gevoeg. Daar word lekker na die tyd gekuier.
- l. 26 November 2024 – Jaar afsluiting en uitstappie by Milhoro Lodge. Naas Grové en Iain Gilbert reel die uitstappie. Baie dankie Iain vir die beskikbaarstelling van die fasiliteite. Willem Frost se nuwe boek word aan Iain geskenk as n blyk van waardering vir die gebruik van die fasiliteite. Die Pilanesbergtak se Algemene jaarvergadering word ook hier gehou. Dit is ook die Pilanesbergtak se 22ste bestaansjaar. Johan en Dweenie skenk n varkie wat Johan vir ons op n spitbraai gaar maak. Dankie Johan.

3. Gemeenskapsbetrokkenheid

- Op 25 Julie 2024 het Henry, Johan en Dweenie Bester n uitstalling en voorlegging by die Hoërskool Wagpos se Landboudag gedoen. Ongeveer 30 bome op die terrein is ook gemerk. Die Dendrologiese Vereniging van Suid-Afrika is bemark en verskeie persone het kom navraag doen.
- Henry Francis skryf op 'n gereelde basis boom artikels vir die plaaslike koerant asook 'n berig oor die groot bome wat opgemeet is by Leeupoort vakansiedorp wat in die plaaslike koerantjie en sosiale media platvorms opgeneem is.
- **Naas Grové is betrokke by die volgende projekte:**
- Laerskool Sliwerkrans Landsdiens – *Bewaring & beskerming vir oorlewing*
- Aanbieding oor *Die plantegroei van die Vredefort Koepel* – University³ Age (U³A) – Potchefstroom
- Vroue Landbou Unie, Mosaïktak, boompraatjie oor die *Koolstofdrempel*
- Gasspreker – Vroue Landbou Unie – Overvaalstreek jaarlikse kongres. *Ongemaklike waarheid van menslike impak op die omgewing*
- Weeklikse radiopraatjie oor inheemse bome –

- Waterberg Stereo
- Maandelikse rubriek oor inheemse bome
 - Noordwes AgriPulse (Afrikaans en Engels)
 - Gyskrag
- MENSA Pretoria, Pretoria Botaniese Tuin, begeleide boomtoer en boompraatjie *Native VS Exotic – good or bad?*
- Dien saam met Sarel van Wyk (Sameroeper) en Francois van Wyk op die Kgaswane Advisory Committee wat die bestuur van die reservaat van kundige advies voorsien mbt tot verskeie omgewings- en bestuurskwessies
- Vergroeningsprojek by die die Rustenburg Hoërskool Arboretum
- Verskeie bome opgemeet vir die Nasionale Register van Grootbome in Suid-Afrika
- Lid van die Waterberg Tree Specialist Group
- Sarel van Wyk wat die inisiatief geneem het om 'n adviserende komitee op die been te bring en as sameroeper op te tree, wat die Kgaswane Natuurreservaat se bestuur van raad en advies bedien met betrekking tot verskeie kwessies rakende die volhoubare voortbestaan van die reservaat
- Johann de Bruin reel n uitstappie na Pilanesberg Natuurreservaat saam met die "Friends of Pilanesberg" om bome in hul kamp en die piekniek area te identifiseer.

4. Opsomming

Ons het goeie bywoning gehad by die uitstappies aan die begin van die jaar maar ongelukkig het die deelname namate die jaar gevorder het ietwat afgeneem.

Daar is 'n verskeidenheid van opsies vir moontlike uitstappies vir 2025 en ons hoop dat dit sal realiseer en goed bygewoon word. Die 2025 jaarprogram sal so spoedig moontlik gefinaliseer word en deurgegee word aan lede.

Jaarverslag: Waterbergtak

Andries van Niekerk – Voorsitter



Die Waterbergtak het tans 103 lede, is baie aktief en daar is meer as 50 boomliefhebbers wat gereeld die uitstappies bywoon. Besoekers word nie bygetel nie. Ons hou maandelikse uitstappies in ons streek (Mokopane, Moogophong, Vaalwater, Modimolle en Bela-Bela). Daar is gewoonlik een 4-dag uitstappie (kamp) per jaar. Voor elke uitstappie word slegs een aspek van boomidentifikasie deur een van die lede bespreek.

Gedurende Januarie het ons die plaas Ezingweni, suid van Modimolle besoek. Hier het ons swartbas raakgeloop wat vir sommige lede onbekend was. Shakamapruim, pypsteelboom, fluweelsoetbessie, horingpeultjieboom en poerabesie was besonder.

Met Februarie se uitstappie is die plaas Bufland, noord van Mookgophong besoek. Lede het heerlik by die dam gekuier en besonderse bome geïdentifiseer, onder andere smalblaarwasbessie, boesmangif, kurkdoringklipels en rotskiepersol. Hier het Andries van Niekerk en sy seun, Wynand, 'n buitengewoon groot karee en 'n platkroon opgemeet. Dié twee bome is deur die Nasionale Register van Groot Bome as rekordbome aanvaar.

Maart se uitstappie is op die plaas Driefontein gehou. Interessant waarnemings was umzimbeet, tontelhout en bosveldwaterbessie.

Die takbestuur was vir 'n naweek na 'n plaas naby Baltimore genooi om bome te identifiseer. Daar was 'n groot verskeidenheid kanniedood-bome. 'n Baie groot hardeboom is daar deur Andries van Niekerk opgemeet.

Andries van Niekerk en Gertie Oosthuizen het die Algemene Jaarvergadering op 2 April in Pretoria bygewoon. Toekennings vir van ons lede wat die boomkennis eksamen geslaag het, is uitgedeel.

Die tak het met die Meimaanduitstappie die plaas van Anita Verwey anderkant Modimolle besoek. Voor die uitstappie het André Weideman 'n baie oulike praatjie oor blaarvorme gelewer.

Nico en Marna Möller het saam met dr Theunis Morgenthal 25 Mei se naweekuitstappie op 'n plaas naby Bakkerspaskloof (Thabazimbi-omgewing), meegemaak. Dit was vir die Möllers 'n ongelooflike ervaring om saam met kundiges in 'n pragtige kloof met 'n groot verskeidenheid bome, struik en ander plante te stap. Die uitsig was ook asemrowend. Dit was 'n wonderlike belewenis om in 'n gebied te kom wat normaalweg nie toeganklik vir die publiek is nie.

Juniemaand het ons Intaba-Indle, 'n wilderness-landgoed besoek. Op een plot het ons 146 aangeplante inheemse bome gesien. Die witstamdoring en die doringolm was besonder. Die bosveldsaffraan het vrugte aangehad. 'n Harige rotsvyg groei oor 'n klippilaar wat deur Italiaanse krysgevangenes op

Intaba-Indle gebou is. 'n Besproeiings-pyplyn het bo-op die pilare gerus.

Saterdag 13 Junie het van ons lede saam met die Magaliestak in Modimolle na bome gaan kyk en daarna gesellig by Lilies & Lime verkeer.

Gedurende Julie het ons Oupa se Plaas anderkant Modimolle besoek. Lede het die dag daar baie geniet en onder andere smalblaarhwarrie en nanabessie geïdentifiseer.

Augustusmaand het ons by Hoërskool Nylstroom besoek afglê. Wie sou kon dink dat daar soveel inheemse bome by die skool aangeplant is. Om maar net 'n paar interessante bome te noem: Besemkaree en pruimvingerblaar. Dr Carel Pretorius en Wynand van Niekerk, ons jongste lid, het 13 jaar gelede 3 witpere by die hoërskool geplant en hulle is nou reeds groot bome.

Gedurende September het ons na Leopard Rock Estate gegaan. Ons was bevoorreg dat dr Theunis Morgenthal die uitstappie kon meemaak. Besonderse bome was krinkhout, horingpeultjieboom, grysappel, koraaltaibos en smalblaarlepelbos. Die dikbas het vrugte aangehad.

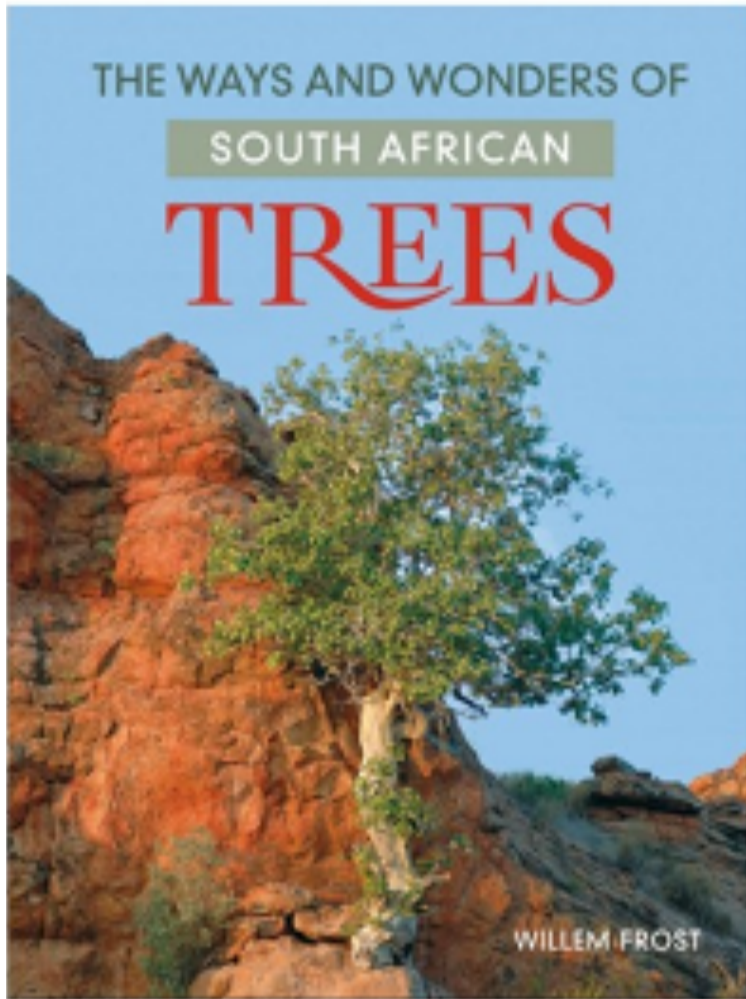
Daar is beplan om met Oktober se uitstappie die plaas Moorddrift naby Mokopane te besoek.

Die jaarlikse afsluitingsgeleentheid in November, gaan by die lapa van Kokanje Aftree-oord plaasvind. Tydens die geleentheid sal daar ook na bome gekyk word.

Hartlike dank aan al die eienaars wat hul eiedomme beskikbaarstel vir besoek deur die Waterbergtak, aan Pieter en Christine Rossouw wat die uitstappies reël. Die werksaamhede en ondersteuning van die Takbestuur word ook baie waardeer.



New publications



The Ways and Wonders of South African Trees

FROST, WILLEM

ISBN 9781775848875

Format Paperback

Recommended Price R480.00

Published August 2024

About the book:

A celebration of the rich diversity and beauty of indigenous trees, *The Ways and Wonders of South African Trees* uncovers the fascinating world of trees and how they function.

Presented in two parts, the first explores the physiology and behaviour of trees and the second the grandeur of a select number of species, richly supported by photographs. A comprehensive introduction focuses on the complex life of trees, uncovering how they grow, compete for water, defend themselves and make use of photosynthesis to survive; their role in pollination; and the symbiotic relationships they have with each other and other life forms. Record-breakers such as the oldest, tallest and biggest trees are also featured.

The second half of the book showcases some 160 conspicuous species, including the iconic baobab, sausage tree and mopane tree, as well as lesser-known but interesting trees such as baboon's breakfast. These accounts describe the unique traits of different trees and their various parts, and discuss how they are used by animals and birds, and by humans.



THE BOOK: [Trees and Shrubs of the Waterberg](#)

Warwick and Michèle Tarboton, well known conservationists and authors of several nature books, led a formidable team of tree and nature enthusiasts to compile this beautiful, informative and user-friendly field guide. As a follow-up to the *Wildflowers of the Waterberg* book, it uses the same formula.

Two years of work included the collection of comprehensive field information including a data base of ± 35 000 images), creating a concise, user-friendly format of every plant. Many of the 318 species are addressed on a full page. The majority were illustrated in support of easier identifying and discerning between plants.

Afrikaans

Michèle and Warwick Tarboton is welbekende natuurbewoorders en outeurs van verskeie natuur boeke. hiel 'n formidabele span van boom en natuur entoesiaste gelei om die pragtige kennisvolle en gebruikersvriendelike veldgids saam te stel. As 'n opvolg van die boek *Wildflowers of the Waterberg*, is dieselfde formule gebruik.

Twee jaar se werk van inligting insamel vanuit die veld, in boeke, webwerwe, ongeveer 35 000+ foto biblioteek, hiel geneem om 'n bondige, gebruikersvriendelike formaat van elke plant saam te stel. baie van die 317 spesies hiel sy 'n eie bladsy vol inligting. Die meerderheid is geïllustreer om identifikasie en onderskeiding tussen plante te vergemaklik.

Linda

0728591512

lindawillemse@gmail.com / wtarbotn@africa.com

Meg Coates Palgrave Eulogy

Tony Coates Palgrave



Meg Coates Palgrave: Flora of Zimbabwe (Photo BT Wursten)

Meg and Paul have always been incredibly interested in natural history of all types and they have gone into a world of different projects.

Some of the things they did when living in Umtali were:

1. Hunting for semi-precious stones in the lowveld, meaning tramping through, dry riverbeds, and in the bush, then prepared the stones in a tumbler the dad made, and were successful at producing jewellery and other ornaments.
2. They were always interested in photography and converted one of the bedrooms into a dark room with enlarger to print photographs, they entered many competitions to test their skills, winning numerous prizes.
3. Meg was particularly interested in tortoise beetles and loved her Barberton daisies.
4. They produced a film called *Pattern of Life* that was based on the circle of life – predominantly of butterflies..... which took up of huge amount of time and effort. Capturing all the images themselves, doing the narration and editing. While tidying up Megs stuff we found a letter from MGM saying that unfortunately the film was 40 minutes long and their analysis of people's attention span was 30 minutes, so they couldn't broadcast it
5. Both Meg and Paul were involved in doing the photographs for the Bundu book series on Snakes and of course the one on Trees. All the snake photographs were taken of live specimens, except the black mamba. The snakes were cooled down in the fridge and then positioned correctly on the dining room table. One evening when they were taking the

green mamba (live), there was a power failure, and all was dark. 1st thing was to get the children and the dog out onto the veranda and then to find some light. Fortunately, the snake was still on the table and disaster was averted.

Paul and Meg moved up to Harare in 1971, as Paul's job took him there and it was in the mid-70's that work on the first tree book started. The first edition was obviously a joint effort by Paul, Meg and Keith and was published in 1977. From Paul and Meg's perspective, this involved many, many trips into the bush to take photographs of trees. Sometimes these were emergency trips when a tip came in that a certain tree was in flower and everything was dropped, fill the car with all the photographic equipment and hit the road to go and collect a specimen for photographing when we got home. You will notice that the illustrations are the specimen adjacent to a drawing of the tree, these were all taken on the lounge floor.

For those that aren't aware, this passion for trees stemmed from Olive Coates Palgrave (Paul's Mom) who produced all the illustrations for a book in that was published in 1956. The text was done by Kieth Coates Palgrave and photographs by Paul and Derek. It covered approx. 110 species whereas the Trees of Southern Africa covered approx. 1 500 different species. Meg donated the original illustrations, 111 of them to Kew gardens as they are an early scientifically current illustration of those trees.

This was what rekindled Meg's love for the trees that lasted right up to the point that she passed away. I

say rekindled because she started studying botany, amongst other subjects in Rhodes university in 1953 but had to give that up due to family money pressure. She was a keen hockey player, selected for Rhodesia as goalie.

After moving to Harare, Shirley and Tony had grown up and could look after themselves, Meg went back to work in the accounts team for an insurance company Etna, and then Stewart Scott and partners, a structural engineering company in Harare. This didn't satisfy her love for the natural world, and she wanted to combine both her working life and free time concentrating on this so in around the mid-90s, she left her job and re-trained as a safari guide. Parts of the training was to demonstrate that she could defend herself and any visitors while out on Safari and to do this, she had to shoot an elephant and a buffalo. Mom resisted this as it didn't sit comfortably with her conservation values.

This was followed by a spell on a farm in Rafangora where she catalogued and identified their trees and set a conservation area.

We are not 100% sure but it was while she was here that she decided to focus on trees, Meg started working on the revision to the book and this was published in 2001, it was a huge task and Meg spent hours and hours re-researching the latest technical information to get the update correct. When she visited Shirley in South Africa or Tony in the UK, the laptop when with her and she would work in the book at every opportunity.

In 2004 Meg sold her house in Kariba Crescent for a whopping ZWD 12bn and moved to Blue Kerry. She always remarked that this was the best move ever made and the support and friends she made here were wonderful and was the reason she didn't want to move to South Africa or the UK (apart from there being 6 indigenous trees in the UK)

Meg was also developing her series of 'know your trees' guides that were area focused and would assist



people in identifying trees in the area, she was running tree courses and was involved in a forestry company in Mozambique called Katapu to identifying and conserving indigenous trees to help with their sustainability initiatives. She actually set up a local herbarium in a shipping container to store specimens of the local trees.

Due to her expertise and reputation, she was asked to join several EU and WHO studies that looked at the impact of various man-made interventions. One that Tony remembers was an area down stream of Kariba Dam where a study was taking place to investigate the impact to the flora and fauna of there being no seasonal flooding since the dam wall had been built.

Always keen to share her knowledge and engage with more people, Meg collaborated with an app developer to help with the identification of trees in a modern platform. This app was available on both iPhone and Android and was based on the 'Know your Tree' booklets but supplemented with photographs. As always, Meg believed that the start of identifying a tree was a leaf because 'we're not always as lucky to have a flower or fruit.

Towards the end and with Megs eyesight failing but her mind still sharp, she was so determined to update Trees of Southern Africa one last time she enlisted the help of Mark Hyde and Jakob Rath to put together the distribution maps, Penguin had organised someone to update the text for Mom.

Meg was greatly admired and loved by all who knew her, and she has left a 'Meg' sized hole in many hearts and her friends, children, grandchildren and great grandchildren will miss her dearly

[Meg Coates Palgrave was an honorary life-long member of the Dendrological Society of South Africa and served for many years on the Society's Tree Names Committee – Ed]



Postal: Postnet 2054, Private Bag 82234, Rustenburg, 0300
Telephone • 082 575 4244 • Fax: 086 670 7715
Web: www.dendro.co.za • E-mail: secretary@dendro.co.za
Facebook: www.facebook.com/DendroSA

Posadres: Postnet 2054, Privaatsak 82234, Rustenburg, 0300
Telefoon: 082 575 4244 • Faks: 086 670 7715
Web: www.dendro.co.za • secretary@dendro.co.za
Facebook: www.facebook.com/DendroSA