Journal of the Cycad Society of South Africa

ENCEPHALARTOS

Tydskrif van die Broodboom Vereniging van Suid-Afrika

No. 109 September 2012 ISSN 1012-9987

CYCAD SOCIETY OF SOUTH AFRICA
BROODBOOM VERENIGING VAN SUID-AFRIKA

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Journal of the Cycad Society of South Africa

ENCEPHALARTOS

Tydskrif van die Broodboom Vereniging van Suid-Afrika

On the cover:

Macrozamia fraseri in the so-called *kwongan* heathland of the Western Australian coastal sandplain of Lesueur National Park, showing a fire-blackened trunk and surrounded by flowering "smoke bushes" (*Conospermum*, Proteaceae). A full treatment of *M. fraseri* will appear in the December issue of ENCEPHALARTOS as part of our "Focus On..." series. Photo: Roy Osborne.

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No. 109 September 2012 ISSN 1012-9987

NUUS VANUIT DIE LAEVELD STREEK: *ENCEPHALARTOS LEBOMBOENSIS* EN *E. UMBELUZIENSIS* UITSTAPPIE

Ina Vermaak

Die Laeveld streek het 'n naweek uitstappie gereel om die *E. lebomboensis* en *E. umbeluziensis* in die veld te gaan besigtig.

Ons was 'n klein groepie dapper stappers wat die Lebomboberge aangedurf het.

E. lebomboensis groei in 'n reservaat gebied en ons was opgewonde om die plante hoog op teen die berg te sien met ons verkykers Gelukkig het ons die gids raak geloop wat ingestem het om ons berg op te neem. Wat 'n stap!

Die berg is baie klipperig en aan die onderste gedeelte is die gras meters lank wat die klim nogal bemoeilik. Dit lyk aanvanklik nie so ver nie maar na 'n uur se stap kom jy agter jy is nog nie eers halfpad nie. Uitgeput en moeg het ons die gedeelte bereik waar *E. lebomboensis* al vir dekades gevestig is. Hulle groei almal op groot klip plate aan die boonste gedeelte van die berg en is baie weliger aan die weste kant. Dit is nogal merkwaardig dat daar nie juis kleiner plante voorkom in die grasvelde nie. Dit lyk asof net die plante oorleef wat beskut is teen vuur, want geen vuur kan by die plante kom wat op die klipplate groei nie. Sommige plante is meters lank.

Na ‘n goeie rus en ’n paar mooi foto’s het ons die terug tog aangedurf.

Ons het oornag in Swaziland en die volgende oggend na die Mlawula Natuur reservaat gery om *E. umbeluziensis* te besigtig. Hier het ons nie ’n gids gehad nie en het op instink gestop en die veld ingevaar. Die terrien is makliker om te stap as die vorige dag. Tussen die Lebombo ysterhout bome het ons *E. umbeluziensis* gekry. Hulle was maar yl en daar was nie groot kolonies nie, miskien is daar verder die bosse in groter kolonies. Hulle groei in die skadu en het groot breë donker groen blare, nogal maklik om te sien in die winter tussen al die bruin blare.

NUUS VANUIT DIE LAEVELD STREEK: JAARLIKSE LAEVELD BROODBOOM VERKOPING

Ina Vermaak

Die jaarlikse Laeveld Broodboom Verkoping het plaasgevind by Halls Gateway in Nelspruit vanaf Vrydag 31 Augustus to Sondag 2 September.

Dit is die derde jaar wat ons die verkoping in Nelspruit hou en dit was ’n baie groot sukses. Ons toon ’n 25% groei per jaar wat vir ons merkwaardig is.

Ons het sowat 800 plante wat deur 9 lede voorsien is, gehad om te verkoop. Die warm Laeveld weer het mense lus gemaak vir die buitelug.

Dit is nogal interesant dat die verkoping baie tuin entoesiaste trek en dat baie van verlede jaar se kopers terug is hierdie jaar vir nog plante. Dit is ’n goeie manier om die broodboom mark te vergroot en meer mense betrokke te kry by die vereniging en ’n liefde vir broodbome te kweek.

Nico Combrink, een van ons lede, wat organiese plant voedings vervaardig, (Soiltech) het van sy produkte saam met die broodbome bemark. Hy was self teenwoordig en het mense van raad bedien t.o.v. sy produkte. Dit het goed ingeval saam met die broodboom verkope.

Die orgidee en clivia klubs het saam met ons uitgestal en volgens hulle organiseerders groei hulle ook van jaar tot jaar. Die plante was besonder mooi en kleurvol.

Die naweek was gekenmerk deur heerlike saam kuier en harde werk.

Ons sien uit na die volgende verkoping wat gehou sal word van 30 Augustus tot 1 September 2013.

SENTRAALTAK BESOEK 'N PAAR TUINE OP 18 EN 19 AUGUSTUS IN POLOKWANE

Dit was vroeg opstaan vir party van ons om 9h00 uur by die eerste tuin te wees.

Dr. Gerrie de Haas se tuin was 'n prentjie gewees met soveel besonderse plante.

Die volgende tuin was die van Mnr. Smit met sy versameling Afrika plante waarvan baie al langer as 30 jaar in sy tuin is.

Hierna is ons na Dr. Xander de Kock om sy tuin te besoek. In sy versameling is *E. brevifoliolatus* en hy help gereeld die bewaringsowerhede met die rehabilitasie van veldplante. Dit was werklik 'n voorreg om sy versameling plante te sien.

Ons is daarna na die tuin van Johan van der Merwe waar daar werklik aan beide kante van die teerpad tuin uitgelê is, ons glo dit is omdat daar nie meer plek in sy erf oor was nie. Pragtig is al wat ons kon sê.

Die Saterdagaand is ons op eg Suid-Afrikaanse skaapbraai getrakteer. Die skaap was heerlik gewees en al die slaaie daarby. Daar is heerlik gekuier en daarna is elkeen na sy slaapplek toe.

Ons is Sondag oggend na Dr. Diekie de Klerk se tuin en kwekery toe waar ons kon sien dat daar

'n groot liefde vir sy tuin en veral die *Encephalartos* plante bestaan. Hier het die klomp besoekers van die geleentheid gebruik gemaak om van sy duisende saailinge te koop.

Die pad is ver terug na Gauteng toe en ons is toe huiswaarts met 'n gevoel dat die besoek besonders was veral met die vriendelikheid en hartlikheid waarmee ons ontvang is.

WES-KAAP TAK: PLANT VERKOPING EN JAAREIND FUNKSIE

Die Wes-Kaap tak van die Broodboom Vereniging hou 'n opedag op 17 November 2012 wat sal saamval met die jaareind funskie van die tak.

Verskeie skaars broodboom soorte en ander skaars plante sal te koop wees. Die dag bied 'n uitstekende geleentheid aan tuiskwekers om deel te wees van 'n georganiseerde plantverkoping. Nie net lede van die vereniging neem deel aan die verkoping nie maar enige tuiskweker van enige ander plante is welkom om ook plante te verkoop. Toegang tot die verkoopperseel is gratis. Lede van die vereniging word toegelaat om plante gratis te verkoop. Nie-lede is verplig om 10% van hul omset aan die vereniging te betaal.

Broodboome word streng volgens wet beskerm en beheer. Slegs permithouers met die nodige dokumentasie in plek sal toegelaat word om broodbome te verkoop.

Die verkope begin 10:00 die oggend en word om 16:00 afgesluit met 'n veiling van verskillende plante. Daar sal 'n inligtingstalletjie wees waar 'n broodboomuitstalling gehou word, mense kan hier die geleentheid kry om by die vereniging aan te sluit.

Om plante te verkoop of vir enige ander navrae kontak Johan Kotze (021 9192434), Frikkie Conradie (084 9510550), Andy Naudé (082 900 8624) of Michael Koopman (084 4082189).

FIRST ANNOUNCEMENT: 10TH INTERNATIONAL CONFERENCE ON CYCAD BIOLOGY

August 16-21, 2015
Medellín, Colombia

The International Conference on Cycad Biology is held every three years, bringing together scientists, students, and dedicated enthusiasts to present their latest findings about this remarkable group of plants. The Cycad Specialist Group, under the auspices of the IUCN, also holds their regular meeting at this conference.

The main themes will include: (1) Conservation, (2) Ecology, (3) Genetics and Genomics, (4) Taxonomy and Phylogeny, (5) Economic Botany, (6) Horticulture, (7) Toxicology, and (8) Information Management.

About Medellín, Colombia:

Medellin, the second largest city in Colombia, is a vibrant business-oriented and well-organized city. Located at 1500 m (5000 ft) in elevation, it has a very pleasant climate that has earned it the title of "City of eternal spring". From Medellin it is easy to visit several highly biodiverse natural areas. For more tourist information on Medellin please visit: http://www.medellin.travel/en.

Medellin has an international airport with direct flights to and from Miami, New York, Madrid, Panama, Lima, and Caracas. Citizens from North America, Europe, Australia, and Mexico do not require a visa to enter Colombia. For information on immigration to Colombia please visit: http://www.colombia.travel/en/international-tourist/practical-information/travel-to-colombia-information-and-advice/before-coming

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Organizing committee:

Universidad de Antioquia (Colombia)
Montgomery Botanical Center (USA)
New York Botanical Garden (USA)
IUCN Cycad Specialist Group

FINANCIAL REPORT

THE CYCAD SOCIETY OF SOUTH AFRICA

ANNUAL FINANCIAL STATEMENTS

FOR THE YEAR ENDED 28 FEBRUARY 2011

The report and statements set out below comprise the annual financial statements presented to the members of the Society.

Contents

Approval of annual financial statements

The annual financial statements for the year ended 31 December 2011 recorded on pages 3 to 9 have been approved and signed on 4 April 2012.

PRESIDENT

TREASURER

Alan Soley
Chartered Accountant (S.A.)

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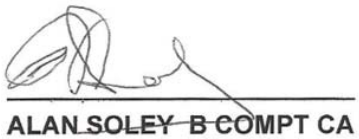
THE CYCAD SOCIETY OF SOUTH AFRICA

REPORT OF THE AUDITOR TO THE MEMBERS

I hereby declare that I am not a member of the Cycad Society of South Africa, and I have no interest in its financial affairs. These financial statements have been compiled from information and explanations received from the Treasurer and Officials of the Society.

I hereby certify the the Annual Financial Statements for the year ended 31 December 2011 are in accordance with the accounting records.



ALAN SOLEY B COMPT CA (SA)

Pretoria
4 April 2012

THE CYCAD SOCIETY OF SOUTH AFRICA

STATEMENT OF FINANCIAL POSITION AT 31 DECEMBER 2011

	Notes	2011 R	2010 R	2009 R
ASSETS				
Non-current assets				
Property, plant and equipment	2	5,307	3,610	617
Current assets				
Inventories	3	64,183	54,026	40,058
Cash and cash equivalents	4	687,648	607,161	632,635
		751,831	**661,187**	**672,693**
Total assets		**757,138**	**664,797**	**673,310**
EQUITY AND LIABILITIES				
Capital and reserves				
Accumulated reserves		666,583	585,700	551,986
Current liabilities				
Trade and other payables	5	90,555	79,097	121,324
Total equity and liabilities		**757,138**	**664,797**	**673,310**

THE CYCAD SOCIETY OF SOUTH AFRICA

DETAILED INCOME STATEMENT FOR THE YEAR ENDED 31 DECEMBER 2011

	Notes	2011 R	2010 R	2009 R
Income		**282,189**	**254,716**	**275,387**
Subscriptions		215,589	195,354	202,438
Donations	6	24,423	14,625	19,619
Sales	7	9,613	7,398	8,954
Interest received on bank balances		32,214	32,869	42,751
Advertisements		350	4,470	1,625
Less: Expenses		**201,306**	**221,002**	**194,674**
Auditor's remuneration		500	500	500
Assets under R5 000		2,698	-	2,583
Bank charges		4,727	2,455	2,931
Board meeting costs		18,093	-	13,103
Branch transfers		11,920	14,426	1,573
Costs - grow cycads		158	2,549	3,772
Costs - grow clivias		-	788	-
Costs - cycads of Vietnam		2,744	1,132	-
Depreciation		3,587	1,487	367
Encephalartos' publication and printing costs		61,464	125,843	81,352
Goode's prints purchased		-	-	2,586
Internet costs		2,387	1,983	1,730
Legal expenses		-	-	40,106
Postage and photo copies		37,946	52,106	36,687
Refreshments		-	-	38
Repairs		1,915	-	1,680
Sponsorships		39,800	8,500	-
Stationery		8,272	4,988	3,359
Telephone		2,697	2,345	2,307
Translation fees		-	1,900	-
Travel expenses		2,398	-	-
Net surplus for the year		**80,883**	**33,714**	**80,713**
Accumulated reserves at beginning of year		585,700	551,986	471,273
Accumulated reserves at end of year		**666,583**	**585,700**	**551,986**

1. Presentation of Annual Financial Statements

The annual financial statements have been prepared on the historical cost basis, and incorporate the principal accounting policies set out below. They are presented in South African Rands.

These accounting policies are consistent with the previous period.

1.1 Property, plant and equipment

Property, plant and equipment are tangible items that:

are held for administrative purposes, and
are expected to be used during more than one financial period.

Costs include costs incurred initially to acquire or construct an item of property, plant and equipment and costs incurred to add to, replace part of, or service it. If a replacement cost is recognised in the carrying amount of an item of property, plant and equipment, the carrying amount of the replaced part is derecognised.

Property, plant and equipment is carried at cost less accumulated depreciation and any impairment losses.

Depreciation is provided using the straight-line method to write down the cost, less estimated residual value over the useful life of the property, plant and equipment, which is as follows:

Item	Average useful life
Equipment	6 years
Computer software	2 years

The residual value, depreciation method and the useful life of each asset are reviewed at each annual reporting period if there are indicators present that there is a change from the previous estimate.

Gains and losses on disposals are determined by comparing the proceeds with the carrying amount and are recognised in the income statement in the relevant financial period.

1.2 Financial instruments

Financial instruments at amortised cost

Financial instruments may be designated to be measured at amortised cost less any impairment using the effective interest method. These include trade and other receivables, loans and trade and other payables. At the end of each reporting period date, the carrying amounts of assets held in this category are reviewed to determine whether there is any objective evidence of impairment. If so, an impairment loss is recognised.

1.2 Financial instruments continued

Financial instruments at cost

Equity instruments that are not publicly traded and whose fair value cannot otherwise be measured reliably are measured at cost less impairment. This includes equity instruments held in unlisted investments.

All financial assets whose fair value cannot otherwise be measured reliably, and which do not meet the criteria to be designated as instruments measured at amortised cost, are measured at cost less impairment.

Financial instruments at fair value

All other financial instruments are measured at fair value through the income statement.

1.3 Revenue recognition

Subscriptions received from members are recognised in the income statement in the financial period to which they belong. Any amounts received in advance are carried over to the financial period to which they belong.

Revenue from donations, sales and advertisements are recognised in the income statement in the financial period in which they are received.

Interest is recognised, in the income statement, using the effective interest rate method.

	2011	2010	2009
	R	R	R

2. Property, plant and equipment

	2011			2010		
	Cost	Accumulated depreciation	Carrying value	Cost	Accumulated depreciation	Carrying value
Equipment	6,908	(6,905)	3	6,908	(6,658)	250
Computer software	9,765	(4,461)	5,304	4,480	(1,120)	3,360
Total	**16,673**	**(11,365)**	**5,307**	**11,388**	**(7,778)**	**3,610**

	2009		
	Cost	Accumulated depreciation	Carrying value
Equipment	6,908	(6,291)	617

Reconciliation of property, plant and equipment - 2011

	Opening balance	Additions	Disposals	Depreciation	Total
Equipment	250	-	-	(247)	3
Computer software	3,360	5,285	-	(3,341)	5,304
	3,610	**5,285**	**-**	**(3,588)**	**5,307**

Reconciliation of property, plant and equipment - 2010

	Opening balance	Additions	Disposals	Depreciation	Total
Equipment	617	-	-	(367)	250
Computer software	-	4,480	-	(1,120)	3,360
	617	**4,480**	**-**	**(1,487)**	**3,610**

Reconciliation of property, plant and equipment - 2009

	Opening balance	Additions	Disposals	Depreciation	Total
Equipment	984	-	-	(367)	617

THE CYCAD SOCIETY OF SOUTH AFRICA

NOTES TO THE ANNUAL FINANCIAL STATEMENTS

FOR THE YEAR ENDED 31 DECEMBER 2011

	2011	2010	2009
	R	R	R
3. Inventories			
Back issues	52,604	39,998 #	38,012
Cycads of Vietnam	1,220	1,220	-
Grow clivias	865	865	691
Grow cycads	2,323	2,955	1,355
Index	3,940	4,240	-
Plastic envelopes	1,582	4,748	-
Postage stamps	1,649	-	-
	64,183	**54,026**	**40,058**
4. Cash and cash equivalents			
Cash and cash equivalents consist of:			
Bank balance - Standard Bank	11,288	1,056	15,030
Bank balance - First National Bank	85	-	-
Money Market account	665,516	-	-
Market Link account	8,989	603,450	616,851
Cash on hand	1,770	2,655	754
	687,648	**607,161**	**632,635**
5. Trade and other payables			
Subscriptions received in advance	62,506	38,940	84,437
Audit fees	500	500	500
Branch transfers	14,460	13,280	10,010
Legal fees	-	26,377	26,377
Printing costs	13,089	-	-
	90,555	**79,097**	**121,324**
6. Donations			
General	12,766	7,570	10,199
Research	11,657	7,055	9,420
	24,423	**14,625**	**19,619**

THE CYCAD SOCIETY OF SOUTH AFRICA

NOTES TO THE ANNUAL FINANCIAL STATEMENTS

FOR THE YEAR ENDED 31 DECEMBER 2011

	2011	2010	2009
	R	R	R
7. Sales			
Back issues	7,624	2,978	8,014
Cycads of Vietnam	273	1,250	-
Grow clivias	516	140	-
Grow cycads	1,200	3,030	940
	9,613	**7,398**	**8,954**

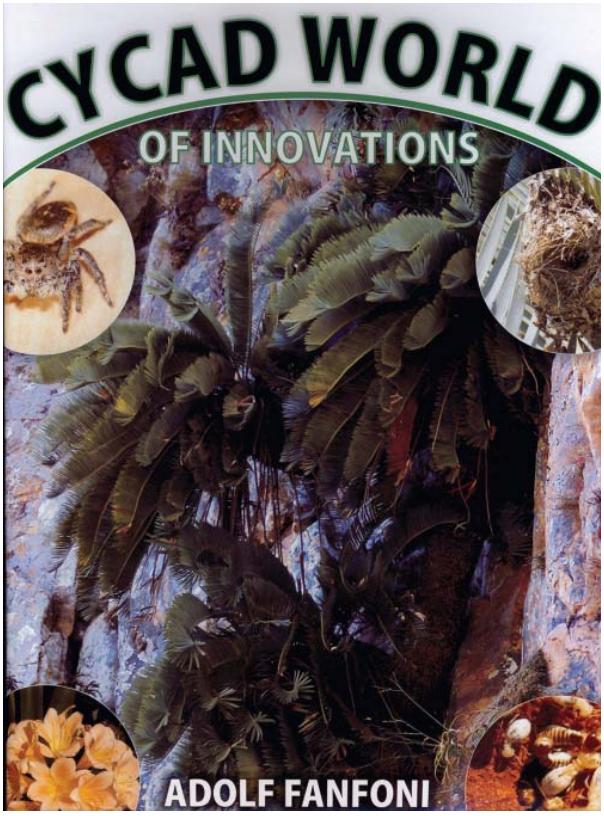
8. Public Benefit Organization

The Society has been registered as a Public Benefit Organization at the South African Revenue Service in terms of section 30 of the Income Tax Act under PBO Exemption number 930 037 522.

BOOK PRIZE FOR 2012

Wynand van Eeden

To encourage contributions to ENCEPHALARTOS, a book prize will be awarded for the best article submitted by a member and published each year. This year the prize is Cycad World of Innovation by Adolf Fanfoni, which he kindly donated. For more information on this publication please contact him at P.O. Box 58804, Karen Park, 0118 or telephone 082 568 9498 or look up his website www.cycadwofi.com.



NEW MEMBERS

The Society welcomes the following new members, who joined between June and September, 2012.

3937 K	LONEHILL TRADING (PTY)LTD	P. O. Box 29244, MAYTIME CENTRE, 3624
3938 G	SWART, Mr. C F	OLYMPUS, 0081
3939 M	VAN NIEKERK, Mnr. D	Posbus 253, MALELANE, 1320
3940 G	HUGO, Me C	Posbus 32197, TOTIUSDAL, 0134
3941 G	VORSTER, Mr. R H	P. O. Box 14808, SINOVILLE, 0129
3942 G	MURRAY, Mr. M	BLAIRGOWRIE, 2194
3943 G	HAM, Mr. T G	P. O. Box 3421, GLENVISTA, 2058
3944 G	NAIDOO, Mr. D	P. O. Box 3423, CRAMERVIEW, 2060
3945 F	VILJOEN, Mr. R G	PINETOWN, 3610
3946 M	GROBLER, Mr. N J	P. O. Box 673, SABIE, 1260
3947 G	INGOLDBY, Mr. M	RANDPARK RIDGE Ext 6, 2169

CYCAD SPECIES IDENTIFICATION WORKSHOP

A workshop is scheduled to be held in the Pretoria area over a number of weekends commencing on Saturday, 6th October. For further details please access the website www.cycadwofi.com or contact the convener, Adolf Fanfoni, on info@cycadwofi.com or 082 562 9498.

Your invoice for the 2013 membership fees is included in this journal. Please ensure that payment is made by the end of January, 2013.

U faktuur vir 2013 ledegeld is ingesluit by hierdie uitgawe. Maak asseblief seker dat betaling geskied voor die einde van Januarie 2013.

NEW PUBLICATIONS

Philip Rousseau

Based on new methods to retrieve publications a new section is included on studies that have not used cycads as their primary investigative subjects, but whose inclusion of cycads as comparative subjects have yielded some notable results.

Studies on cycads

ASMUSSENA, B. & MCINNESC, P. In Press. Assessing the impact of mid-to-late Holocene ENSO-driven climate change on toxic *Macrozamia* seed use: a 5000 year record from eastern Australia. *Journal of Archaeological Science*. http://dx.doi.org/10.1016/j.jas.2012.06.005

Data shows that during the mid-to-late Holocene (~12 000 years ago) eastern Australia became significantly drier. This work investigates the impact on Aboriginal societies, specifically the utilisation of toxic *Macrozamia* (cycad) seeds at seven archaeological sites. Results show an extremely close correlation between the intensity of seed use and two *El Niño phenomenon* datasets, and a weaker correlation with a third. This resulted in humans exploiting less desirable resources (such as the poisonous seeds) as other more favourable ones were affected negatively by the dried periods. They also find that these changes were significant enough to affect other wider cultural systems.

NAIR, J.J. & VAN STADEN J. 2012. Isolation and quantification of the toxic methylazoxymethanol glycoside macrozamin in selected South African cycad species. *South African journal of botany* http://dx.doi.org/10.1016/j.sajb.2012.07.011.

Cycad leaf and seed tissue was examined and quantified for the poisonous compound macrozamin. *Cycas revoluta, Cycas thouarsii, Encephalartos natalensis, E. transvenosus, E. villosus* and *Stangeria eriopus* were investigated with *Encephalartos* containing the lowest quantities. A comprehensive physical and spectroscopic characterisation for the toxin is here presented for the first time. Notably levels differing significantly from other literature sources, possibly due to environmental factors. Levels between seeds and leaves vary for *Encephalartos* and *Stangeria* but barely for *Cycas*, with no clear pattern as to which organ has the greater *quantity.*

FALLAHABADI, P.R., DAVOOD HASHEMABADI, D., ONSINEJAD, R., ZARCHINI, M. & KAVIANI, B. 2012. Improving Germination Rate of *Cycas revoluta* L. by using Different Cultivation Media and Scarification. *Annals of Biological Research* 3: 3187–3191.

Available online: http://scholarsresearchlibrary.com/ABR-vol3-iss7/ABR-2012-3-7-3187-3191.pdf

The scarification of seed, i.e. mechanical or chemical removal of some outer layers, is a well known tool to aid in seed germination. Here scarification is tested in different media (peat, cocopeat, perlite and sand) for *Cycas revoluta* seed. The earliest germinating seed were scarified in 100% peat pots, highest germination success by scarified seeds in peat 50% and sand 50%, maximum germination value was obtained in scarified seeds cultivated in pure peat. Scarification and different cultivation media had significant effect on all measured traits.

Works including cycad species

KEITH, D.A., MCDOUGALL, K.L., SIMPSON, C.C. & WALSH, J.L. 2012. Spatial Analysis of Risks Posed by Root Rot Pathogen, Phytophthora cinnamomi: Implications for Disease Management. Available online: http://escholarship.library.usyd.edu.au/journals/index.php/LIN

Flora in the Royal National Park in New South Wales (Australia), which hosts two *Macrozamia* species, were tested for susceptibility of the *Phytophtera* species. *Macrozamia spiralis* was found to be susceptible while *M. communis* was not.

GABRUK, M., GRZYB, J., KRUK, J. & MYSLIWA-KURDZIEL, B. 2012 Light-dependent and light-independent protochlorophyllide oxidoreductases share similar sequence motifs. *Photosynthetica.* DOI: 10.1007/s11099-012-0057-z

A fragment of amino acid sequence (TFT motif) has been found in two enzymes associated with photosynthesis. These enzymes are apparently phylogenetically unrelated and functionally redundant. *Cycas taitungensis* has been included in the analyses of the physicochemical properties of the amino acid residues, its spatial arrangement and a possible physiological role.

ASHIHARA, H.,YIN, Y., KATAHIRA,R., WATANABE, S., MIMURA, T. & SASAMOTO, H. 2012. Comparison of the formation of nicotinic acid conjugates in leaves of different plant species. *Plant Physiology and Biochemistry* 60: 190–195.

There are three metabolic fates of nicotinic acid in plants: (1) nicotinic acid mononucleotide formation for NAD synthesis by the so-called salvage pathway of pyridine nucleotide biosynthesis; (2) nicotinic acidN-glucoside formation; and (3) trigonelline (N-methylnicotinic acid) formation. In the present study, the metabolism of [carbonyl-14C]nicotinamide was investigated in leaves of 23 wild plant species. All species readily converted nicotinamide to nicotinic acid, and only a fraction of nicotinic acid was utilised for NAD and NADP synthesis. The remaining nicotinic acid is converted to the nicotinic acid conjugates. Only one plant species, *Cycas revoluta*, produced both nicotinic acid N-glucoside and trigonelline.

INEGBEDION, A.O., ERIYAMREMU, G.E., LOLODI, O., OKORO, I.O. & OSAGIE, O.R. 2012. Alterations in glucose-6-phosphate dehydrogenase and mitochondria oxygen consumption in rats fed with cycads, Nigerian-like and western -like folic acid supplemented diets. *African Journal of Food Science* 6: 421–426.

Rats were fed three diets, a Nigerian like diet (low protein, high carbohydrate), a western like diet (high protein, high fat), and a normal diet. Each had a cycad included variation and a folic acid supplemented treatment. These results suggest that Nigerian diet and folic acid may protect rats against colon cancer and the Western diet may enhance colon carcinogenesis.

HASSAN, N.A., RADWAN, S.G. & EL-SAHN, O.M.N. 2012. Common scale insects (Hemiptera:Coccoidea) in Egypt. *Egyptian Academic Journal of Biological Sciences* 5: 153–160.

Saissetia coffeae were recorded on *Cycas revoluta* in El-Zohreya Botanical Garden Giza Governorate.

HELMY, E.I., KWAIZ, F.A. & EL-SAHN, O.M.N. 2007. The usage of mineral oils to control insects. *Egyptian Academic Journal of Biological Sciences* 5: 167–174.

Mayonnaise oil (Alboleum) recorded the highest reduction percentage on the population of *Saissetia coffeae* (Walker) (Hemiptera:Coccidae) infesting *Cycas revoluta* Thunb (Cycadaceae) palm-like plant with 94% after 25 days from spraying.

RACHEL S. MEYER, R.S., DUVAL, A.E. & JENSEN, H.R. 2012. Patterns and processes in crop domestication: an historical review and quantitative analysis of 203 global food crops. *New Phytologist.* Avialable online: http://onlinelibrary.wiley.com/doi/10.1111/j.1469

Current knowledge on domestication of food crops is built on a few well-studied 'model' crops, many of them from the Poaceae (grass) family, e.g. maize, wheat. This paper studies a broad range of unrelated plants for their domestication information (e.g. center of domestication, plant traits, wild ancestors, domestication dates, domestication traits, early and current uses) for 203 major and minor food crops. *Encephalartos altensteinii* and *E. caffer* are included. Many typical features of domestication associated with model crops, including changes in ploidy level, loss of shattering (breaking open of fruits), multiple origins, and domestication outside the native range, are less common within this broader dataset. The overall time required to domesticate a species has decreased since the earliest domestication events. The frequencies of some domestication syndrome traits (e.g. nonshattering) have decreased over time, while others (e.g. changes to secondary metabolites, the plants defense chemicals) have increased.

ANADÓN-IRIZARRY, V., WEGE, D.C., UPGREN, A., YOUNG, R., BOOM, B., LEÓN, Y.M., ARIAS, Y., KOENIG, K., MORALES, A.L., BURKE, W., PÉREZ-LEROUX, A., LEVY, C., KOENIG, S., GAPE, L. & MOORE, P. 2012. Sites for priority biodiversity conservation in the Caribbean Islands Biodiversity Hotspot. *Journal of Threatened Taxa.* Available online: http://threatenedtaxa.org/ZooPrintJournal/2012/August/o299606viii122806-2844.pdf

The Caribbean Islands Biodiversity Hotspot is exceptionally important for global biodiversity conservation due to high levels of species endemism and threat. A total of 755 Caribbean plant and vertebrate species are considered globally threatened, making it one of the top Biodiversity Hotspots in terms of threat levels. Amongst these are two *Zamia* species in three areas of interest. Key Biodiversity Areas provide a valuable framework against which to review the adequacy of existing national protected area systems and also to prioritize which species and sites require the most urgent conservation attention.

KAMINSKI, K., BECKERS, F. & UNGER, J.G. 2012. Global internet trade of plants – legality and risks. Bulletin OEPP/EPPO Bulletin 42: 171–175.

Internet trade of plants were imported into Germany from third countries worldwide. Internet trade of plants may pose a high phytosanitary risk when commodities are infested with non-native pests including quarantine pests. One hundred and seventeen consignments of plants were purchased including banned goods, *Cycas multipinnata* was one of the plants purchased. Results show 89% of the consignments did not comply with phytosanitary import requirements. Harmful organisms were found in 13% of the consignments and 2% of these were quarantine pests.

KHOSHBAKHT, K. & HAMMER, K. 2007. Threatened and Rare Ornamental Plants. *Journal of Agriculture and Rural Development in the Tropics and Subtropics* 108: 19–39.

The application of IUCN criteria and Red List Categories was done for ornamental plants. About 500 threatened ornamental plants could be found and presented in respective lists.

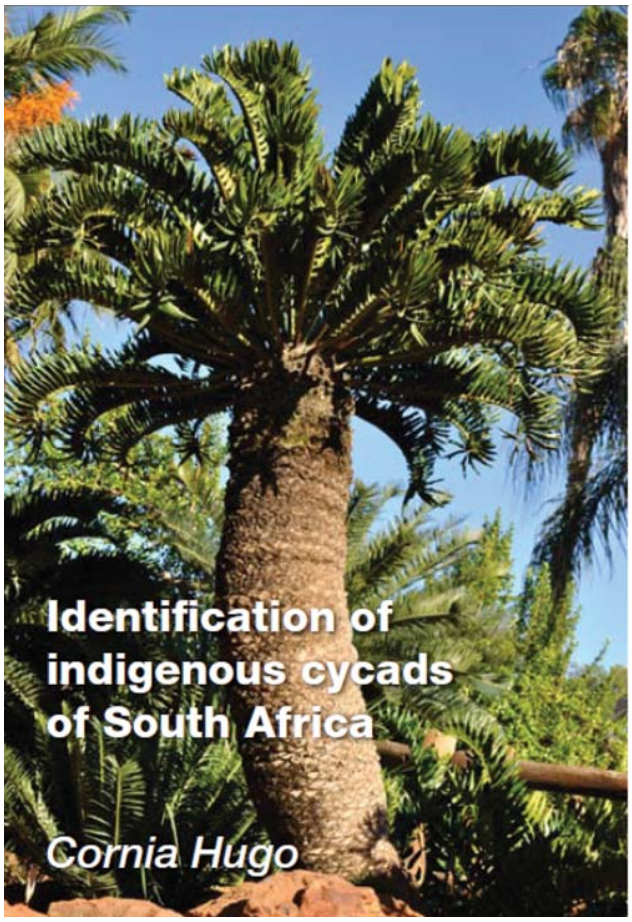
Rare ornamental plants with 209 species is the largest group followed by Vulnerable (147), Endangered (92), Indeterminate (37), and Extinct (6). Very rare ornamental plants are presented in collections and in cases such as cycads plants already extinct in the wild get well establish in collections. The Zamiaceae shows a high number of threatened species (47) readily in cultivation, though extensive collection has at least in some cases caused this rarity.

PÉREZ-FARRERA, M.A., VOVIDES, A.P., MARTÍNEZ-CAMILO, R., MARTÍNEZ-MELÉNDEZ, N., GÓMEZ-DOMÍNGUEZ, H. & GALICIA-CASTELLANOS, S. 2012. *Zamia grijalvensis* sp. nov. (Zamiaceae, Cycadales) from Chiapas, Mexico with notes on hybridization and karyology. *Nordic Journal of Botany* 30: 001–006. doi: 10.1111/j.1756-1051.2012.01453.x

BOOK REVIEW: IDENTIFICATION OF INDIGENOUS CYCADS OF SOUTH AFRICA

*Philip Rousseau

Author: Hugo, Cornia.
138 pages, full colour, soft cover, English, R390.
Available from:
Katina's Garden Nursery, 240 Veda Street, Montana, Pretoria.
Tel: 012 524 3364
E-mail: corniahugo@gmail.com
Webpage: http://cycadid-sa.co.za/



This latest book on *Encephalartos* was written by Cornia Hugo, a nature conservationist from Gauteng. She has more than 20 years of experience, identifying cycads in gardens. The book is essentially an identification key for the genus *Encephalartos* and more specific for the species indigenous to South Africa. The book includes:

- An introduction on the key and its purpose
- The conservation status of cycads
- Legal aspects of cycads in South Africa (as it stands on publication)
- A table of monetary values of cycads for the period 2011 to 2012
- Growing conditions for South African cycads
- A glossary of botanical terminology used in the key
- A short section of some of the characters employed in the key
- A dichotomous key for identifying all indigenous *Encephalartos* species (except *E. brevifoliolatus* but including *E. umbeluziensis*), with a few photographs of each species showing mostly vegetative characteristics.
- Lastly a few pages at the back are dedicated to *Stangeria eriopus* and four exotic species i.e. *E. manikensis* (representing most exotic *Encephalartos* species with the characters shown), *Cycas thouarsii, C. revoluta* and *Dioon spinulosum.*

A little background on keys is in order to aid the discussion of the book. Keys are used by botanists to identify species. Keys are constructed by specialists of a particular group to allow others not acquaint themselves with that group and to identify members without expert assistance. These keys are often very complex as they refer to very specific structures and terminology. There are essentially two types of keys, polyclave and dichotomous. A polyclave key works by selecting as many characters as possible, using computer software, which then reduces the number of possibilities. Most people familiar with *Encephalartos* completes this process in their mind to do identification of a species. A dichotomous key, as in this book, supplies the user with two contrasting statements (called leads) and each choice leads one to another set until a species is reached. The drawback of a dichotomous key is that you easily get stuck when a question demands information not at your disposal, e.g. seed characteristics when the plant is not shedding. A single wrong answer will set you on the incorrect path unless the key makes provision for such mistakes. It is very important when using a dichotomous key to read both leads fully and make a choice on which fits best. One should never only read the first as the second might fit even better.

The current work is specifically written for people with no botanical training, let alone experience with cycads. Prof. Nat Grobbelaar provides a very good key in his book (Grobbelaar 2002) but well defined terminology is troublesome to laymen and the key necessitates cones in some cases. The new key has been written with as little botanical terminology as possible unless this is unavoidable. A glossary has been given to explain the terminology used. Many practical tests are included, such as wrapping of leaflets, rubbing of wax and so on. The characters used for identification are also all vegetative which allows for sex and circumstance independent identification.

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I really enjoy the approach taken in that the first step is to group your plant into one of six very distinct and easily identifiable groups e.g. linear leaflet group (leaflets less than 10mm wide) or blue unlobed leaflet group. These groups have a manageable number of species in each, allowing for quick identification. This cuts out the many steps it would normally take to eliminate obviously incorrect species. The leads used are mostly very easy and making the correct decision is instinctive. Most species have a short description, focusing on traits that in combination, are not shared with other immediate options.

The book is neatly laid out, easy to use and aesthetically pleasing. Having said that, I would have liked page numbers at each group. Even though groups are colour coded, this is not reflected on the page where the grouping is done and makes it difficult to find your group of choice quickly. The same applies to a species when identified since no page number is given to guide you to the pages with applicable illustrations.

The following errors are also unfortunate as it detracts somewhat from a very neat piece of work. Almost right throughout the book the nomenclatural error is made of not including a space after the abbreviated generic name, e.g. *E.trispinosus* [sic]. Commendably however all specific epithets are in lower case. In terms of species names *Encephalartos eugene-maraisii* is consistently misspelled without it's hypen while other minor slipups include *E. brevifoliatus* [sic], *E. lehmanii* [sic], *E. fredeici-guillielmi* [sic], and *E. hirsitus* [sic]. All figures have species names and most photographs are of good quality depicting characteristics difficult to capture on film. In some pictures the depth of field is not enough and that lessens their usefulness to illustrate the characteristics to the level necessary to make an accurate decision in the key.

Keeping in mind the intended audience of the book, some issues are still problematic. The author admits that the book does not provide support for all the variation found in a species treated. It also only makes provision for the identification of plants exhibiting adult characteristics. I still feel that the book is too formal and much of the terminology could have been done away with, e.g. incubous and succubous could have been restated as overlapping from the bottom up or top down respectively. The measure of a good key however is in it's robustness, i.e. does it cover all possibilities and can it absorb user errors and still deliver a correct identification.

Having personally used the key I frankly do not consider it very robust. Species are only listed once, i.e. one mistake and you arrive at the wrong option, very little variation is included, some species are absent from the key and only listed under *E. lebomboensis* (*E. aemulans,E. senticosus, E. msinganus),* and some characters listed, overlap between closely related species. It seems that this stems from the need to make the key as simple as possible to at least allow some sort of identification for complete novices. Work then still continues to make a robust key for not only indigenous *Encephalartos* but the whole genus, using both polyclave and dichotomous keys.

In conclusion then I am pleased with the current work as I feel it is a step in the right direction as far as identification keys are concerned. A species treatment is too specific and not always helpful. Setting up a key is no easy task and the attempt in this book is admirable. I thank the author for penning down her hard earned knowledge, gained over many years. The illustration of specific traits used for identification is extremely valuable.

I consider the current retail price of R390 a fair amount for this useful and well-illustrated book. I would also recommend it to anyone interested in learning how to use keys for identification and which characters are useful when identifying species of *Encephalartos*. If any potential buyers need more information, do visit the website mentioned above for a closer look at this publication.

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U faktuur vir 2013 ledegeld is ingesluit by hierdie uitgawe. Maak asseblief seker dat betaling geskied voor die einde van Januarie 2013.

Visits to three *Encephalartos ferox* colonies: provisional impressions

Philip Rousseau[1]* & George James Mann[2]

As part of the larger endeavor to produce a monographic revision of the genus *Encephalartos,* field work was conducted on three natural populations of *Encephalartos ferox*.

Encephalartos ferox has always been regarded as a morphologically (both vegetative and reproductive) variable species (Vorster 2004), yet easily distinguishable as a species, even at juvenile and seedling stages. Because of its well-defined diagnostic features, Dr. Piet Vorster places the species as unassociated in his groupings of species, a position confirmed by the senior author's molecular work (Rousseau 2012). *Encephalartos ferox* is characterised by very wide ovate and heavily dentate leaflets, undulate in its width, unmistakable smooth pinkish to red cones, and seeds with a red sarcotesta. Amongst collectors special interest has always been shown towards the variability primarily in the so called "cigar leaf form" (Figure 1) and the "yellow cone form" (Figure 2). The known distribution of *E. ferox* extends from northern KwaZulu-Natal in South Africa, northwards in a more or less continues strip halfway up the Mozambican coast, the latter range involving the provinces of Maputo, Gaza, Inhambane and Sofala. Plants invariably grows at low elevation and close to the sea (IUCN 2010).

The first field trip was by the first author to a population in the northeastern corner of KwaZulu-Natal (Maputaland) in January 2012. At the time formal field protocols were not yet established so general observations were made and photographs taken. *Encephalartos kosiensis* was described in 1932 as an "apparently distinct species", though no cones were known, and the author (Hutchinson 1932) stating: "It is no doubt allied to *E. ferox* Bertol. from Mozambique, which I have not seen". It was indeed deemed as such and subsequently treated as a synonym of *E. ferox*, which is still the practice today. Plants from this area (Figure 3, 4) were described as without a visible stem, leaves probably 1 m long, rachis channeling towards the tip with perhaps 20 leaflets, slightly overlapping imbricately (lower leaflets shielding upper ones), oblong elliptical and sessile, leaflet bases more of less rounded, apex 3–5-lobed (though technically this refers to heavily toothed; see Vorster 1998), pungent and triangular, 2–4 teeth on lateral margins 80–150mm long, 30–50mm wide, very thin with about 25 parallel veins. Although this description was made from only two leaves and no photographs of the whole plant, it is are more or less representative of the plants in that area and for the species at large. Plants are found in coastal sand dunes (Figure 5),

Figure 1.—Cigar leaf form in cultivation, Pretoria.

Figure 2.—Yellow cone form in habitat, southern Inhambane.

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Figure 3.—General habit and morphology of plants in habtitat, nothern KZN.

Figure 4.—Habitat of *E. ferox* in nothern KZN.

Figure 5.—Leaflet detail of plants in nothern KZN.

appearing abruptly in a seemingly uniform habitat along the coastline and disappear just as abruptly further inland. Most plants are found under tree canopies in the otherwise grassy surroundings, notably under specimens of *Syzygium cordatum* (Myrtaceae) (Figure 6). Suckering is sporadic mainly in older individuals with stems very slightly emerging, though most are subterranean. After some searching many seedlings were found (Figure 7) dispersed within 10 m of what is presumably the mother plant, though no remnants of cone material (male or female) was seen. Thus natural pollination still occurs and the activity of the pollinator might explain the absence of at least male cone remnants as these are often used as food (Donaldson 1997). As the plants occur in a nature reserve there does not seem to be any threats to the population as no dead individuals or signs of plant removal were found. However, several plants were seen in rest camps and the establishment of lodges may increase removal from the wild for horticultural purposes.

The second trip was conducted by both authors to the Inhambane Province of Mozambique where field data were collected in habitat and numerous individuals in gardens were photographed. Two populations were surveyed, but for one only half a day was available.

Our first stop was in the southern parts of the province where on inquiring about plants we received help from a local nurseryman who sent a guide, Fernando, with us (Figure 8). The plants were found scattered on a very high and steep sand dune a few kilometers inland. They are emergent from the shrubs and trees they presumable germinated under growing in full sun (Figure 9). Plants often sucker profusely with stems very

Figure 6.—Plants are almost always found under trees in nothern KZN.

slightly emergent to completely subterranean (Figure 10). The leaflets were dark green and broadly ovate. Leaflets with margins rolled under (recurved towards lower surface) vary amongst individuals and some plants the margins were entirely flat or even upturned (involute) (Figure 11). Clearly the leaflet margins display no fix pattern of folding which would discredit the character for recognition as for example a variety or form of *E. ferox*. Leaflets range from 30–45mm wide and 140–150mm long with leaves quite long, most over 1.5 m to around 2.5 m. Fresh male cones were found, the oldest of which were within a few weeks of shedding pollen. Notably one cone had completely disintegrated and inside the peduncle white grubs were found burrowing down (Figure 12). These might be the pollinator's larvae, but no adult insects were seen. Also very significantly one multistemmed individual produced yellow cones (Figure 2) on one head while on the others the more typical orange-red cones were found (Figure 13). This clearly indicate that the yellow cones are a mere colour variant, not at all confined to individuals, let alone populations, and as such deserves no taxonomic recognition at any level. A single female individual in cone was found with immature red cones (Figure 14). Natural pollination seems to occur as numerous germinating seedlings were found. Dispersal, however, is so poor some germinated in the crown (Figure 15) which accumulates copious amounts of sand. Locals are planting cassava (*Manihot esculenta,* Euphorbiaceae) along the lower reaches of the dune and some cycads may be cleared to make room for cultivation. Other threats include the rapid expansion of tourism in the region where the numerous new lodges each have their own garden of mature *E. ferox* plants. Also along the roads numerous quite large specimens were being sold openly to passing motorists.

Figure 7.—Numerous seedlings in deep shade close to mature plants.

Figure 8.—Fernando our guide at our first colony.

Figure 9.—Plant emerging from under tree cover to grow in ful sun in habitat, southern Inhambane.

Figure 10.—Subbterrean stem of mature male plant in habitat, southern Inhambane.

Figure 11.—Leaflets with margins flat, upturned and rolled under.

Figure 12.—Insect larvae eating male cone peduncle.

Figure 13.—Red cones on same individual as Figure 2.

Figure 14.—Female cone in habitat, southern Inhambane.

Figure 15.—Seedling germinating in the crown.

Figure 16.—Aqautic snail remnants on flood plain, northern Inhambane.

Figure 17.—Raised sand hills on the flood plains, northern Inhambane.

Figure 18.—Broadly linear leaflets.

The second population investigated was around halfway up the Mozambican coast. Our guide for this was Alberto, a staff member at our lodge. Although he knew where the plants were we had to ask for local assistance as the plants occur once more in a seemingly homogeneous area of less than 1 km^2 in size. Plants occur in a seasonal floodplain of turf (Figure 16) on slightly raised sand hills (Figure 17) amongst copious numbers of *Phoenix reclinata* (Arecaceae) palms. The plains are burnt every second or third year with a fire that passed through the previous year. Plants grow in full sun with seedlings and juveniles shaded by other cycads and palms. They are conspicuously emergent with stems of close to a meter in length being quite common. The leaves are shorter than in the previous population with few over 1.5 m. Leaflets are markedly narrower with very few over 30 mm, most being in the around 20 mm while the length complies to the norm. This results in leaves assuming a broadly linear (Figure 18) shape instead of the broader ovate shape with

Figure 19.—Orange male cones, nothern Inhambane.

Figure 20.—Old male cone with long peduncles.

leaflets significantly more crowded than in the other two populations. Both of these states could possibly be due to the full sun exposure with temperatures soaring in spring and summer. A single male specimen was located with one of its orange cones close to shedding pollen (Figure 19) and with the remains of old peduncles being quite long (Figure 20). Numerous insects of two species were found inside the cone, one being a species of *Porthetes* (Coleoptera: Curculionoidea) while the other is an as of yet unidentified Coleoptera. Also a single female in cone was found with bright yellow cones (Figure 21) with very clear green band visible in cross section (Figure 22). From spent female cones of previous seasons the sarcotesta seems to be red (Figure 23). The few lodges

Figure 21.—Bright yellow cones of female in northern Inhambane.

Figure 22.—Green band on the inside of cone scales.

Figure 23.—Sarcotesta on seed from previous season.

in the area each have their own cache of cycads with our guides showing us where they had dug up individuals. It seems, however, they target juveniles (stems less than ~200 mm in diameter) as they are easier to transport. The population as mentioned occurs in a very small area with less than 100 mature individuals and perhaps half as many juveniles. Seedling regeneration is very good and survival rates seem good which could buffer collection should it stay aimed at juvenile plants.

The plants in northern Inhambane push us right to the edge of our concept of *E. ferox* and what variation should still be considered under the species in a broad sense. Attributes such as leaf dimensions are highly environmentally determined and should one consider these simply as a narrower leaved *E. ferox* it does fit the species. The male cones fit neatly into the concept for the species but we will confirm this with the identification of the insects. The female cones, however, are so far outside the norm for *E. ferox* that it justifies further consideration. It must be kept in mind that immature (i.e. not ready for pollination) cones from a single individual were found and these may not representative of the population at large. Also the red sarcotesta of the seeds is in agreement with *E. ferox* as is the phenology. Furthermore, we have no idea what specimens from nearby regions look like and a gradual transition may well exist from southern to northern Inhambane and even to the populations further north into Sofala. We will more thoroughly investigate the populations of *E. ferox* along the Mozambican coast in the next few years, but our early observations seem very interesting indeed.

On a lighter note our neighbors in northern Inhambane at a lodge called Lulas Paradise who hail from South Africa (Figure 24) had imported plants from southern Inhambane which they started pollinating after learning the procedures. Several very nice individuals decorate their garden with the first batch of seedling produced (Figure 25). Hopefully they can serve as an example for other lodge owners to alleviate the pressures of wild collecting.

Acknowledgments

For the first trip we would like to thank the Du Plessis family for their hospitality. For the second one the Rodel family for their consideration and support on a very long journey. A big thanks to Bara Lodge for getting

Figure 24.—Lulas Paradise owners with the authors.

Figure 15.—Seedlings produced at Lulas paradise.

us to the cycad population and the Club 15 staff for their support in the field.

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U faktuur vir 2013 ledegeld is ingesluit by hierdie uitgawe. Maak asseblief seker dat betaling geskied voor die einde van Januarie 2013.

A visit to Botshabelo to see *Encephalartos lanatus* in habitat.

Andre Cilliers

Every two years or so I like to go to the Olifants River catchment area to walk among the thousands of *Encephalartos lanatus* plants growing there. Recently though, I undertook the first trip to the locality in the winter months.

It was sad to see the decay of the Botshabelo German mission station. It is barely ticking over, and I believe it has tremendous potential to be a very historic and special place to visit. However, the hiking trails are still functional and clearly marked. Despite this, we lost our way in the beginning, but ended up seeing some beautiful specimens of *E. lanatus* on the level ground (see Figure 1), before we descended into the ravine towards the river. Practically all of the plants were in cone!! It really was unbelievable. Sadly, there was a lot of evidence of monkey or baboon damage on the emerging cones (Figure 2). In fact, there were many cones which had simply been broken off while they were still young and immature. These were lying next to the cycads.

As we left the level ground and started moving down between the rocks and trees, there was evidence of a severe fire in the region. Despite the fact that the environment was rather unattractive, the burned grass made the cycads more visible in the ravine among the rocks. It was incredible to see the burned stems pushing cones through the black crowns: evidence of the life within the charred stems (Figure 3). I just realised again that these plants truly are survivors from a different era.

Figure 1

Figure 2

Figure 3

Figure 5

Figure 4

Figure 6

There seemed to be more dead cycads in the ravine itself than on the slopes adjacent, where splendid specimens could clearly be seen.

As I had observed in the past, there were a large number of dead cycads (Figure 4). Although I always hate to see this, the converse was also true and many young seedlings could also be seen (Figure 5) among the rocks, and even in the cracks of very large boulders (Figure 6)! I could not help but wonder whether this brave little cycad would ever develop into a large specimen like those around it.

Considering that so many plants were in cone at this time of year (end July) I am almost certain that after the cones, a flush of leaves was also likely to emerge in the summer! I have never seen such enthusiastic growth in my specimens in the garden. It seems that burning the stems really is the best thing to do. I have just never had the heart to do it though. The collectors who have had the heart to do this say that it works wonders on a lazy *E. lanatus*!!

Seeds were not plentiful, but a few were present, some of which had already rooted. I did, however, see many seeds that had been burned in the fire which had recently moved through the region (Figure 7). All in all, the population that I visited looks very healthy with evidence of pollination and re-growth. We also saw a beautiful group of about 30 Rooi Hartebeest, a solitary male Warthog, a Baboon and a cheeky troop of Vervet monkeys along the way. The site is certainly worth a visit, but I believe that in the summer the plants would appear better with new leaves.

Figure 7

Cycads in central Australia are not ancient relics

An ancient plant isolated in the heart of Australia, more than 1200km from its coastal cousins, is now believed to have arrived inland far more recently than initially thought.

Researchers from The University of Queensland (UQ), the Queensland Herbarium and The Australian National University have found that *Macrozamia*, a genus of cycad found only in Australia, arrived in central Australia millions of years later than the 30 million years initially believed.

The research team found this species known as the MacDonnell Ranges cycad (*Macrozamia macdonellii*) was too similar to its relatives more than 1200 km away in eastern and coastal Australia to have been isolated in central Australia for 30 million years.

James Ingham of UQ, a PhD candidate on the team, said comparisons between the plants revealed little difference.

"Some of the central Australian plants have chloroplast DNA with an identical sequence to those in eastern Australia," said Mr Ingham.

"This is much too similar for the plants to have been isolated in central Australia since the Eocene period, instead suggesting that *Macrozamia* in central Australia has only become isolated sometime in the past couple million years."

"In contrast, plants from Western Australia have been isolated from plants in eastern Australia for much longer, possibly for as long as ten million years or more."

Macrozamia cycads occur in south-west Western Australia, central Australia and along the east coast, including Queensland and New South Wales, but nowhere in between those three regions.

The MacDonnell Ranges cycad is a species unique to central Australia and is the only cycad in the region.

Mr Ingham says, until now, researchers have generally believed that the MacDonnell Ranges cycad has survived in central Australia since the Eocene period, more than 30 million years ago when Australia's climate was much wetter and rainforest much more widespread.

Because cycad fossils from the Jurassic period look very similar to cycads living today, it was previously assumed that cycads have remained more or less unchanged for millions of years.

Overall, the study supports two other recent studies indicating that living cycad groups have been around for only the past 10–20 million years, much younger than during the Jurassic when cycads served as dinosaur food.

James Ingham is a UQ PhD candidate whose research focuses on the evolution of *Macrozamia*. He has a strong interest in the conservation of threatened species, and nearly a third of *Macrozamia* species are threatened.

Cycads are a group of non-flowering plants that look like palms but reproduce with cones and have existed as a group since about 270 million years ago.

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An American's experience with *Encephalartos princeps* in the wild

* Paul D. Sternberg

My second trip to South Africa from California took place in September, 2011. I had first visited this amazing country in 2008 with my wife Karen, when we had our first real introduction not only to its famous cycads but also to its overwhelmingly friendly people. That trip was way too short and we knew we needed to return. Karen was able to revisit South Africa the following year, this time unencumbered by a nagging illness that diminished her enjoyment of the previous trip. Her experience there only fueled my desire to return as soon as feasible. We had opted to avoid 2010, allowing the country to be immersed in soccer and not suffer the added complications of having to deal with foreign cycad tourists. In 2008 we met Douglas Goode for the first time, and quickly he, Karen, and I became good friends. In our subsequent visits, he has been our anchor post. We travel together and Karen and I blatantly pick his brain for bits of his vast knowledge on the plants, people, customs, language, and everything else South African.

At last the time came for my eagerly awaited 2011 visit. After a final 44 hours, evenly divided between flying and layovers in various airports, I met Douglas at King Shaka Airport in Durban, along with John, a friend of mine from California who I had invited to share the experience and who had arrived the previous evening. I was impressed with this new airport's clean and logical layout.

Douglas had in mind an approximate route for visiting a number of cycad habitats. Our plan was to drive through the Transkei and into the Eastern Cape, with our first cycad encounter to be *Encephalartos princeps.* After trying to see all the species in the Eastern Cape, we would then travel north for a second round of exploration. After finishing off my first day in SA in the Durban area, we set off the next morning. I was so relaxed to be back in this country that I had enjoyed so much three years earlier, and especially with my best friend Douglas. I looked forward to seeing John's reaction to witnessing these magnificent plants in habitat for the first time.

This article concentrates only on the first couple days of our cycad odyssey. In the end, we did see all the species in the Eastern Cape, and some amazing plants in the northern provinces as well, and indeed many of them arguably were at least as impressive as the most massive specimens of *E. princeps* we encountered. The entire tour is being written as a large article for future publication, but it was thought that the events that occurred in this first part warranted its' being published early. Certain officials within Nature Conservation also felt that this story should be told as soon as possible, after they were contacted about it early in 2012. With that, following is our experience with *E. princeps*.

Encephalartos princeps (Figure 1) is one of those species that has historically been less challenging to view in habitat. A well-known spot to see the plant is known as the Kei River cuttings, which is where a bridge carries the R56 over the Kei River. At one time, large plants with an interesting leaf structure grew in abundance on a rise surrounded by river sediment just downstream from the bridge. These plants had been poached out probably by the end of the 1970s. I wondered aloud to Douglas if there might be any plants that may have grown from seeds left behind. No plants poked above the bushes as we walked past this area. At the river's edge, we were treated to the first wild cycad viewing of our trip (and John's first ever of a wild *Encephalartos*): a large clumped plant popping out of a rock slab across the river. This was on a farm that was being vigilantly patrolled by the owner even as we watched. On our side of the river, behind the low rise that formerly held plants and across a small braid of the Kei, was a steep high slope that at one time was rich with *E. princeps*.

A dirt road near the highway led partway up this slope to a group of tribal homes. Cycad book in hand, Douglas approached one of the residents, an older man, regarding our quarry. Soon a younger man appeared, and pointed toward the steep slope in the downstream direction. He said there were 32 plants to see there. We were curious that he would know how many, but with that promising news we followed the pathway from the residences away from the road, with the younger man as our guide. Two other men quickly joined us, running from their homes. Even as we just reached the edge of the encampment, our attention was directed by our guides to a tarp on the ground. One of them lifted it to reveal about a 1.5 m long *E. princeps*, lying on its side with a few roots and tattered leaves, along with some detached smaller pieces that probably were suckers from the large plant. After our silent numbing shock decreased to where we could comprehend what was going on, Douglas asked our guides "How much?" One of them replied "150 Rand." At the approximate conversion rate at the time of 7 Rand to the dollar, that meant we could have carried this ancient plant off to our car for about $20. We expressed to our guides that we were interested in seeing plants in the wild, still in the ground.

We continued on the path, which angled down toward the Kei braid, which we had to cross by boulder hopping. After noticing that one of the guys was on his cell phone, Douglas thought the better of things, walked back up to get our car, and brought it to where we could get to it more quickly if we needed to (and away from the buildings). He caught back up with us as we walked along the riverbank with the cliff on our left. Finally in the distance I saw what looked like *E. princeps* leaves

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ARTICLES

Figure 1.—*Encephalartos princeps* on the plateau above the Kei River, flanked by *Euphorbia grandidens* and *Cussonia* sp.

sticking up over the top of a sand bank near the water (not a normal setting for this species). Indeed it was not normal. Cresting the sand bank we looked down upon a pile of once majestic but now humiliated large *E. princeps*, heaped in a hollow in the sand. I think the three of us turned white with horror. We had been seeing occasional torn princeps leaves on the path, and now it was evident that we had been walking on the trail poachers were using to drag plants, probably by their leaves, from the mountainside to their village. I asked if I could take a group photo by the plants, and surprisingly everyone obliged (Figure 2). One large sucker, about 40 cm long, was in the mud of the stream below the sand bank. I went down to retrieve it and immediately sunk in the mud up to my knees. It was quicksand, but not very deep. I was able to reach for the plant and hand it up to John before working my way over to the bank. Trying to keep our cool, we persevered with them to have them show us a plant still in the ground.

Finally, after another half a kilometer or so, we turned toward the slope and started up a crude trail on a series of steep switchbacks. We probably climbed about 100 meters before starting to contour along the slope. We passed a couple recent looking holes, with small suckers of *E. princeps* still present at the edges (Figure 3). Just beyond these, our goal was attained: a single very nice plant, untouched, at least today, by cycad greed (Figure 4). We could only think that this was just the next one on the list, and tomorrow it would be down with the others by the river. The little trail coincidentally ended here, so we turned back down. As is expected in these situations, we were to tip our guides for their time and, well, guidance provided to us. This turned out to be a rather sour affair, as we had only wanted one guide, but all three of them wanted to be paid, and more than the R150 we had thought to give. In the end, to avoid an even worse outcome, we gave them much more than we would have if we had simply bought the first poached

Figure 2.—Three alleged poachers stand with several recently dug *Encephalartos princeps*. Douglas Goode points to the cliff where these plants should have been. John is at center.

plant they showed us and gone on our way. Fortunately our car was intact, and we blasted out of there.

Our destination that night was the small village of Komga. This lies in the middle of an area with some larger game hunting farms, within *E. princeps* country. As we drove there, we discussed what we had just witnessed, and cemented among ourselves the need to report the incident tomorrow. Komga is a tiny town, devoid of restaurants but with at least one nice B&B, and it has an interesting establishment called the Komga Sports Club. It was fairly late when we checked in at our B&B, the Red Valley Inn, and when we asked the receptionist there about where one might find a beer, the Komga Sports Club was mentioned. She called ahead for us, and in a minute or two we buzzed the gate alarm there, and the gate opened for us. The interior of the Komga Sports Club was a slice of living South African history. The entry hall was adorned with photos of past presidents of the club, dating back I believe to the 1930s. The dark, paneled walls exuded feelings of the tradition and stability over time of this culture within the bigger culture outside. All the photos were of white males. We followed sounds along another hall to our right and found

Figure 2.—Fresh holes on the slope above the river. A few suckers remain at the rims of the holes.

Figure 4.—Next in line: this plant stands just beyond the holes shown in the previous photo, at the end of the rough trail up the cliff.

ourselves in a small bar room. There were three empty stools near the entry door, and the bartender approved of our sitting at them. The other stools were occupied with a group of 7 or 8 people who looked much like those in the photos in the entryway, except there were two women present as well. Everyone was older, and probably all of them were local farm owners. A couple of them asked us a few questions, as we were new and two of us had funny accents. One of the women was more curious than everyone else, and mustered up all her knowledge of America to keep up a conversation with us. She told us that there were no places to eat in town, but called our B&B (she knew the lady there) and arranged that they would open the kitchen and make us dinner. This is the kind of hospitality and friendliness that keeps us coming back to South Africa. At the bar, the rest of the group sat quietly, sipping their drinks of choice and mostly watching rugby replays on the flat screen above the bar. As we put away a few beers we discussed our strategy for tomorrow, wondering how Nature Conservation would approach the poachers after our visit with them today. We soon returned to Red Valley Inn, where our dinner was ready. I believe John received "total immersion" into the world of cycads today in South Africa, on this his first day going to see them in the wild. We soon retired to a relaxing sleep.

Having seen only a couple of plants of *E. princeps* growing in the ground so far, we did have some interest in seeing a few more of them before moving on to document another species. In 2008 Karen, Douglas, and I had the privilege of visiting one of the farms not too far from Komga, and we had arranged for a return visit this morning. Soon we greeted the owners of this farm again (Grant and Jolene, the names used in Karen Sternberg's 2011 article in the USA cycad journal), and had a nice reunion. We related our story of yesterday to them, and Grant immediately went into action, calling one of his friends at the local Nature Conservation office. He gave him Douglas' cell number, and proceeded to have a fairly lengthy talk with the official. With that, Jolene requisitioned a bakkie (pickup truck) and driver, and the five of us drove a short distance to a spectacular untouched habitat of *Encephalartos princeps*, overlooking the Kabousie River. The plants share the habitat with the also very dramatic *Euphorbia grandidens*, sculpted into beautiful form by the climate as it grows slowly from cracks in the diabase bedrock (Figure 5). In cultivation this plant forms a dense tall bush with little character, in response to the fattening garden lifestyle. Also present were other bushes and small trees, as well as the aggressive invasive shrub *Lantana camara*, which is doing its best to replace all the native plants in this area. It was so nice to see the fantastically large and old specimens of *E. princeps*, looking the same as they did when I saw them three years earlier. Although it has been in the family for a long time, we just have found out in early 2012 that the farm has been placed up for sale. The current owners are staunch cycad conservationists, but economic pressures can overpower everything and we can only hope that future custodians of this land appreciate the irreplaceable treasure that grows upon it.

Our schedule dictated an early departure from Grant and Jolene's farm, so we said our good byes and made our way to Komga for petrol in anticipation of the next chapter of our adventure. Just at the petrol station Douglas' phone rang. To his and our excitement, it was the Nature Conservation office. They were indeed very interested in what we had discovered yesterday, and it sounded like they fully intended to take some action. We had agreed last night at the sports club that any officers sent out be very discreet, in plain clothes and using an unassuming vehicle. The NC official seemed to feel the same way. Douglas described the individuals, the locations of the plants and other details, and that I had taken a picture of them with poached plants. The officer wanted me to keep the photo private and not show it to anyone or publicize it. We were satisfied that the NC office seemed to be taking this incident very seriously, and that something positive might come out of it. Excited discussion based on the morning's events, including creating hypothetical scenarios about what might happen to the poachers and the plants, brimmed from our car as we made our way toward the area of Cathcart, to the northeast and somewhat inland from Komga.

This day had been dedicated to visiting and documenting a magnificent population of *Encephalartos friderici-guilielmi*. The details of this event will be covered in a future article. It must be said here, however, that this species, though often maligned as being common, slow, difficult to transplant, etc., and thus ranked low on the scale of desirability of cycads, really is a fantastic plant. As seen in the wild, it holds its own against any other. The plants possesses a timeless beauty that fits in perfectly with the ancient rock formations from which they grow.

During the three hours or so that we wandered among these incomprehensibly old plants, other things had been happening. Douglas, who had returned to the car shortly ahead of me, soon received another phone call. It was the local Nature Conservation officer, and he

Figure 5.—A companion of *E. princeps*, *Euphorbia grandidens* grows from small fissures in the solid rock on the plateau surface.

wanted to give us an update. They had assembled a sort of sting team, and using the information we had provided yesterday, returned to the little group of homes above the Kei River bridge. What he said next was enough that the three of us could no longer hold in our emotions. Of the three (alleged) poachers who had taken us up to see the princeps habitat, one of them ran off once the intentions of the team were determined, but two were caught. Before being taken off to jail, they led the officers to their stash of what turned out to be 32 uprooted plants of *Encephalartos princeps*. We had seen fewer than 10 of these yesterday. The suspects then had to load all of the plants into the Nature Conservation vehicle. Douglas was told that the plants were to be replanted across the Kei River, at the farm we had seen across the river with John's first *Encephalartos* sighting. We could scarcely believe what we heard. It looks like our chance visit to see the Kei River princeps might have served a far greater purpose than we could have imagined. We were to be kept up to date on events in this poaching case, and meanwhile, as the investigation proceeded, we were not to discuss it or release the photo to anyone.

For the next several weeks the three of us continued on our quest to visit and record habitats. Having come face to face with poachers made it very clear to us how real the threat to the existence of these irreplaceable living treasures is. Back overseas, in California, we hear frequent reports of habitats being stripped of their plants but from that far away some of the impact is lost. In South Africa, there were many places we went that Douglas had described as once having multitudes of large plants, but in September of 2011 had no remaining traces of cycads, even after spending days looking, criss-crossing the mountainsides and getting sliced by thorn scrub (Figure 6). Other habitats had been reduced around the edges or thinned as easier or more attractive specimens were taken out. For a couple species, we could not gain access to the remaining populations because their caretakers (farmers or large game reserves) were currently on the front lines in a war with poachers, and understandably just wanted to protect the plants and simply not allow anyone at all in to see them. We saw habitats that had visibly changed between the time Karen photographed them in 2009 and when we went just two years later. Particularly graphic was a population of *Encephalartos horridus* that completely disappeared, and one of *E. humilis* that was essentially removed from the planet. These places have been changed forever and are now just typical countryside, with maybe just a few shallow holes to suggest what was once there. The success stories are few, but there are some, such as Modjadji and the famous hill population of *E. dyerianus*, both protected by gates, guns, or tribal laws (although even so, there is a slow leak in the dyerianus security, and a serious revision of the rules regarding what to do with seeds in needed). Most of the protection seems to originate with conscientious farmers who value this national biological heritage, but the weakness is that farmers can't be expected to form an unbroken chain of protection through time. Farms can be divided and sold, and resources can't be dedicated to fences or guards when just making a living at all is difficult. I certainly don't have a new solution. It has been clear for a long time that any solution must involve sensible laws enforced by incorruptible officials. To me sensible laws start with real penalties for poachers, and severe penalties for those driving the poaching, whether they are profiteers or wealthy collectors trying to outdo each other. Assistance should be offered to farmers trying to

Figure 6.—The community of Penge. Along the Olifants River and in the hills behind it, searching revealed that *Encephalartos inopinus* appears to have been completely exterminated by September 2011.

protect plants on their property, and laws regarding trade in seeds and seedlings should be made less oppressive to encourage propagation.

By the end of September, as our time approached to leave South Africa for the USA, we had not received another update regarding the *princeps* poaching incident. As of the date of this writing, February 2012, we still are awaiting any word. No request has been made to us for a statement or for my photographs. We don't know if the recovered plants have been returned to habitat. It appears that it all just "went away". Needless to say, this is rather disappointing to all of us. We felt that this incident should be publicized soon, before it becomes irrelevant, and thus this article has been written with the photographs included. All we can hope is that justice has been done somehow, especially to whoever might have been behind the removal of these plants and struck another blow to South Africa's natural heritage.

Acknowledgements

I wish to thank Douglas Goode, who makes our visits to South Africa so fulfilling and without whom none of it would be possible. Also thank you "Grant", "Jolene", and your family for allowing us to see your beautiful habitat and for protecting the plants. Thank you Karen, my wife, for letting me take off for adventure and holding things down back home, as well as giving me editorial and informational assistance. And thanks John for your enthusiastic camaraderie and various contributions to the experience.

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Beetles associated with *Encephalartos* in a Pretoria garden

*Philip Rousseau

Figure 1.—Healthy mature male Encephalartos transvenosus.

The recent death of two mature and well established plants (Figure 1) in our garden was a mysterious occurrence. The article published in *Encephalartos* 105 (October 2011) by Paul Kennedy however shed some light on what might be happening. Also the various beetles we have discovered on our cycads deserves reporting.

There are a great diversity of beetles (order Coleoptera) know to be associated and often exclusive to cycads and none more so than with the genus *Encephalartos*. Beetles known to be truly associated with *Encephalartos* include species of: *Apinotropis* (Anthribidae); *Antliarhinus, Platymerus* (Brentidae); *Porthetes, Peltostethus, Amorphocerus* (Curculionidae: Amorphocerini); Phaecorynes (Curculionidae: Rhynchophorinae); *Metacucujus* (Boganiidae); along with several undescribed members of the Cucujoidea, Erotylidae and Languriidae (Oberprieler 1995; Downie *et al*. 2008; Suinyuy *et al*. 2009, 2010). These however are associations found in their natural habitat and are by no means a definite in a cultivated scenario especially in a region devoid of any natural cycads such as Pretoria. It is thus of interest to see which beetles have been able to cross over into cultivation.

Figure 2.—*Encephalartos lebomboensis* Mananga form with female *Antliarhinus* sp.

Figure 3.— cf. *Encephalartos lebomboensis* Piet Retief form invested male cones.

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Figure 4.—Habit of worm in male cones.

Figure 5.—Detail of worm found in male *Encephalartos* cones.

Figure 6.— Uninfested male cones of cf. *E. lebomboensis* Piet Retief form

Figure 7.—*Encephalartos altensteinii* male with immature cones.

Figure 8.—Female cone of cf. *E. lehmannii* x *E. trispinosus*

The first species we discovered in our garden was both sexes of the seed parasite *Antliarhinus zamiae* found on the female cones of *E. lebomboensis* "Mananga form", and surprisingly also found on the adjacent male specimen's cones (Figure 2). Since these beetles are known not to be pollinators (Donaldson 1997) their presence on the male cone may be indicative of the identical volatiles released by male and female cones (Suinyuy *et al*. 2010; Suinyuy *et al.* in press.; Suinyuy *et al*. in prep.) which must be used as a guide by the parasite to the receptive and by extension "open" cones to parasitise.

Shortly after this we began to see an infestation (Figure 3) of mature male cones by some larva (Figure 4, 5), most notably on our *cf. E. lebomboensis* "Piet Retief form" (Figure 6) (*cf.* is short for *confer* in Latin meaning "compare to" and in botany usually means "most like" when the identity is unsure). These I have been unable to identify and would welcome any suggestions as to their identity. We are also uncertain as to what the adult form is and if the immature form eats the pollen, though we suspect it may.

The final and most alarming find relates back to the opening remarks. Both our *E. altensteinii* male (Figure 7) and *cf. E. lehmanii* x *E. trispinosus* female

Figure 9.—Beetle found in *E. altensteinii* crown after cone removal.

Figure 11.—Detail of beetle found on *E. altensteinii.*

Figure 10.—Beetles found in mature female cone.

Figure 12.—Detail of beetle found on *E. lehmannii* x *E. trispinosus.*

(parentage unknown) (Figure 8) had coned and when the cones were removed a peculiar beetle was found (Figure 9-11). The beetle looks identical (Figure 10, 11) to the *Melanotranes internatus* as reported to occur on *Encephalartos* by Paul Kennedy. Just before this our *E. transvenosus* of 25 years had suddenly died after coning and another of our mature *E. lebomboensis* males was also displaying the same symptoms with a loose crown of leaves shortly after coning. Once the leaves were pulled out of the crown we discovered larvae that to us looks identical (Figure 13-15) to the ones described as the immature form of *Melanotranes* in Paul Kennedy's article.

On a more positive note there is also the possibility of pollinating beetles in our area as two gardens we know nobody has pollinated have female plants that produced viable seed. We however have never found any beetles active on receptive cones except for *Antliarhinus.*

Figure 13.—Numerous white larva found in *E. lebomboensis mananga* form stem.

Figure 14.—Detail of larva

Figure 15.—Larva burrowing into stem.

As I am not an entomologist I would welcome any suggestions on the identity of any of these insects and have preserved samples in 70% ethanol. Also the possible treatment to malicious ones, though we have already administered *Chlorpyrifos, Malathion (mercaptothion), Blue death (carbaryl/permethrin + deltamethrin) and Temik (aldicarb) to all our plants to combat the stem boring insect.*

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MOSS GROWTH ON CYCAD STEMS

Dear Sir,

Could the erudite readers of ENCEPHALARTOS please advise on the following query...

Approximately a year ago (and in order to do away with the infrequent and erratic manual control of the garden sprinkler) I installed an automatic sprinkler system such that the watering is now automatic and on a daily basis. Whilst this has greatly enhanced the plant and bird life in the garden, there have also been some unforeseen results. Among these unexpected results is the luxurious growth of moss on the stems of some cycads which are exposed to this daily watering.

Figure 1.—Moss growth on an *E. lebomboensis*.

Figure 2.—Moss growth on an *E. arenarius*.

Whilst moss growth may be seen in some quarters as an added indicator to enhance the impression of age (cf. bonsai) I would imagine that the opposite applies to cycads. My real question however is this: Does moss growth on the stem of cycads adversely affect the long term health of cycads? So far my cycads with the moss growth do not appear to exhibit any detrimental consequences, but maybe the time span of observation is too short?

I would be grateful if readers with experienced in long term moss growth on cycad stems can give input here.

(In the meantime I am removing such moss growth with a garden hose pipe at municipal water pressure head of approx 24m)"

Regards,
Luigi Slaviero

Dear Luigi,

In nature cycads often carry epiphytes: in South Africa I have seen them with ferns, orchids, *Haworthia*,

Figure 3.—Moss growth on *E. altensteinii*.

Figure 4.—*Dioon califanoi* with cacti growing epiphytically on its stem in Oaxaca, Mexico

and various Crassulaceae; in Mexico with *Mamillaria.* They commonly play host to various mosses.

Personally I have always considered mosses to be a sign of good water relationship. Cycads seem to grow better when they have mosses on their stems. I have even planted mosses on the stems of my cycads in Stellenbosch, which has a winter-rainfall Mediterranean type climate. I am less enthusiastic about those other plants in Figures 2 and 3—if that was in my garden, I would have removed them.

Where in Italy do you live? I very much like the soil in your photos—it seems to be very well-drained. Volcanic?

Regards,
Piet Vorster

Die redakteur

Die manlike keëls van broodbome is besonders netjies vir my. Hier is 'n paar foto's. Die *Macrozamia lucida* is in my eie tuin in Pretoria-Noord geneem. *Cycas rumphii* en *Zamia restrepoi* het ek afgeneem in Nongnooch Tropical Garden in Thailand.

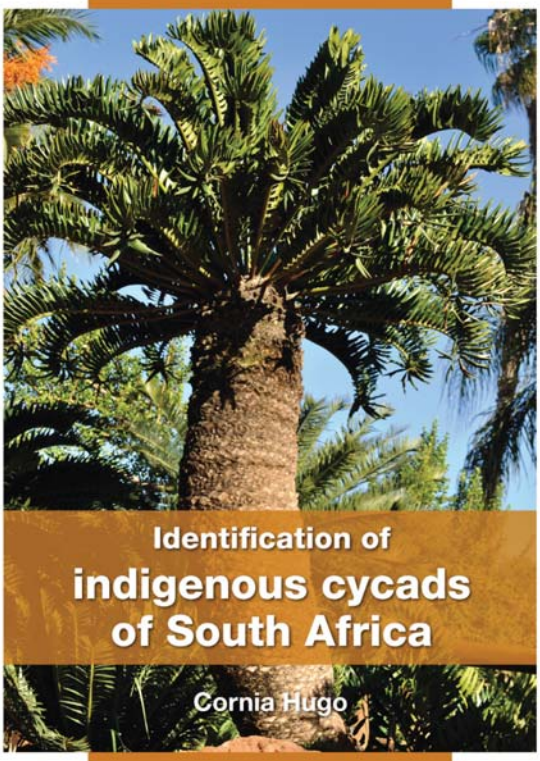
Pieter Janse van Rensburg,
Pretoria Noord

[Pieter likes the neat appearance of these cones and sent in the photographs to illustrate. He photographed the macrozamia in his garden but the other two species are from Nongnooch Tropical Garden in Thailand. Ed.]

Cycas rumphii

Macrozamia lucida

Chigua restrepoi



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The booklet is A5 in size, consists of 36 pages, is printed in colour and addresses various matters under the following headings:
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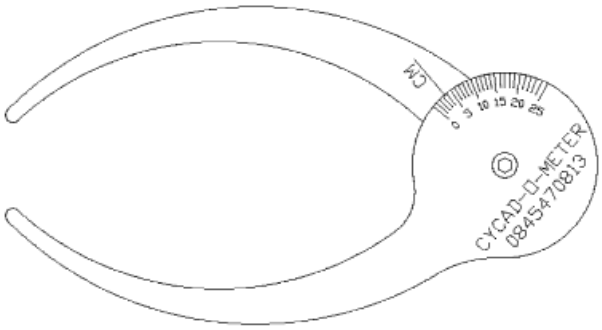

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Apart from being a co-ordinator of the Kirstenbosch Gardening Series, Graham Duncan is a specialist horticulturist at Kirstenbosch Botanical Garden where he curates the collection of indigenous South African bulbs, and the displays inside the Kay Bergh Bulb House of the Botanical society Conservatory.

He has co-authored two major publications on indigenous bulbs, Spring and Winter Flowering Bulbs of the Cape with Barbara Jeppe, and Bulbous Plants of Southern Africa with Prof. Niel du Plessis.

The book is available at the cost of R140.00, postage included, to South African addresses.

THE CYCAD SOCIETY (USA)

The Cycad Society (website: www.cycad.org; email: membership@cycad.org) is a nonprofit organization based in the United States. It is dedicated to the conservation of cycads through education and scientific research. The full color Cycad Newsletter is published 4 times per year. Membership is for the calendar year.

For more information, please contact:
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_____ Poskode _____

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doen hiermee aansoek om lidmaatskap van die **Broodboom Vereniging van Suid-Afrika** en verklaar dat ek/ons die doelstellings van die Vereniging soos dit hieronder gelys is, heelhartig onderskryf:

1. *Om die kweek en vermeerdering van broodbome aan te moedig.*
2. *Om inligting oor broodbome op verskillende wyses te versprei, onder andere deur die gereëlde publisering van 'n tydskrif.*
3. *Om die wettige uitruil van plante, saailinge, saad en stuifmeel van broodbome tussen lede te reël.*
4. *Om wetenskaplike navorsing oor broodbome aan te moedig.*
5. *Om alle aspekte van die bewaring van broodbome te bevorder.*
6. *Om bande met organisasies wat soortgelyke doelstellings het op 'n internasionale basis te smee en te handhaaf.*

- Ledegeldvir**2013***
  Addisioneel tot die ledegeld wil ek/ons ook graag die volgende bydraes maak:
  - BroodboomverenigingNavorsingsfonds
  - Algemenedonasie

Totaal (Ledegeld en donasiesingesluit)

JA	NEE

Deur JA teselekteer, gee ek/onstoestemmingaan die Verenigingom my/onskontak en adresbesonderhede op die Vereniging se ledelysaananderledetepubliseer.

Handtekening _____ **Datum** _____

*LEDEGELD VIR2013

Plaaslike lede (inwoners van Suid-Afrika)	**R 220**						
Suider-Afrikalede (Namibië, Swaziland, Zimbabwe, ens) ***Lugposaflewering***	**R 340**	Suider-Afrikalede (Namibië, Swaziland, Zimbabwe, ens) ***Landposversending***	**R 300**	Oorseselede ***Lugposaflewering***	**R 370** **US$ 56** **AU$ 55** **€ 40** **£ 34**	Oorseselede ***Landposversending***	**R 330** **US$ 49** **AU$ 48** **€ 38** **£ 29**

Lede ontvang 'n kwartaalikse kopie van die vereniging se tydskrif *ENCEPHALARTOS*.Plaaslike lede moet hulle ledegeld en die voltooide vorm stuur aan Ian Bassingthwaighte en alle tjeks of poswissels moet uitgemaak word aan die "Broodboomvereniging van Suid-Afrika".

IanBassingthwaighte, Posbus 176, 0159 Montanapark, Pretoria, Suid-Afrika.

Betaling in Suid-Afrikaanse Rand kanook gemaak word by:

Bank	Standard Bank	**Tak**	Hatfield	**Takkode**	01-15-45	**Rekeningnommer**	011943300
SWIFT	SBZAZAJJ						

Betalingverwysing: Lidnaam en lidnommer.
Bewys van betaling asook aansoekvorms moet gestuur word aan: Faks: +27 086678 9807 (faks na e-pos)
e-pos: cycad@cycadsociety.org

Nuwe lede ontvang 'n eksemplaar van al die uitgawes van *ENCEPHALARTOS* vir die jaar waarin hulle aansluit op die veronderstelling dat daar voorraad is.

CYCAD SOCIETY OF SOUTH AFRICA

www.cycadsociety.org

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0159 Montanapark
Pretoria, Suid Afrika

Tel/Faks: +27 12 548 1152
E-pos: cycad@cycadsociety.org

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DEBIETORDERVORM

PERSOONLIKE BESONDERHEDE VAN KLIëNT					
Van / Besigheid naam:					
Volle name / Trading Name:					
ID nommer / Registrasie nommer:					
Fisiese Adres:					
Pos Adres:					
Kontak nommers:	HUIS	WERK	SELFOON	e-POS	FAKS
Kliëntverwysings nommer:					

BANKBESONDERHEDE VAN KLIëNT				
Naam van rekeninghouer:				
Rekening tipe:	TJEK	TRANSAKSIE	SPAAR	ANDER
Naam van Bank:				
Rekening Nommer:				
Taknaam:				
Takkode:				
Kredietkaart:	MASTER	VISA		
Laaste 3 syfers van Kredietkaart:				

TREKKINGS INSTRUKSIE - merk as van toepassing											
R	Jaarlikse aftrekkings	X	Voltooi alleenlik datum van 1ste aftrekking	d	d	m	m	j	j		
Verhoogings	Sien nr. 7 onderaan										

Ek/Ons, die kliënt of behoorlike gemagtigde verteenwoordiger daarvan ("die kliënt"), gee hiermee goedkeuring aan die entiteit hieronder genoem **Broodboom Vereniging van SA** , STRATCOL BPK en/of sy agente, om d.m.v. 'n Elektroniese Debietorder van die bogenoemde rekening te vorder, en om genoemde gelde oor te betaal aan **Broodboom Vereniging van SA** . Die goedkeuring gegee is beperk tot enige maksimum bedrag en trekkingsdatum gestel of binne 7 dae daarna.

Ek aanvaar die volgende om van toepassing te wees hiertoe:

1. Hierdie goedkeuring mag net teruggetrek word met 30 (dertig) dae skriftelike kennis aan die gebruiker by sy/haar fisiese adres;
2. Ek en/of die KLIëNT, afsonderlik en/of gesamentlik, vrywaar **Broodboom Vereniging van SA** en STRATCOL BPK en/of sy agente teen enige eise van enige aard wat kan ontstaan a.g.v. die elektroniese debiet of oordragte d.m.v. hierdie goedkeuring hetsy reeds teruggetrek of nie;
3. In die geval waar die relevante rekening nie genoegsame beskikbare fondse het om enige debiet te dek nie, is ek bewus dat 'n addisionele fooi van **R50** gehef sal word teen die KLIëNT se rekening deur **Broodboom Vereniging van SA** vir hierdie terugsending, asook 'n onbetaalde fooi deur die KLIENT se eie bank. Ek aanvaar die verantwoordelikheid om genoegsame en beskikbare fondse gelykstaande aan die minimum bedrag soos hierbo genoem, te verseker (of soos aangepas van tyd tot tyd)
4. Enige verwysing na die entiteite soos hierbo genoem sluit in 'n verwysing na enige opvolger in titel of in aanstelling;
5. Hierdie goedkeuring is nie 'n verwysing van 'n spesifieke betalingsooreenkoms van rekeninge nie en dit dien slegs as 'n ooreenkoms vir die manier van betaling, gedeeltelik of ten volle en enige rekening met die gebruiker sal net gekrediteer word wanneer die werklike betaling deur **Broodboom Vereniging van SA** ontvang is;
6. Sou enige dispuut ontstaan insake **Broodboom Vereniging van SA** se regte om gelde te vorder in terme hiervan, is die onnus op die KLIëNT om sy bank die instruksie te gee om enige debiete terug te stuur as onbetaald.
7. Jaarlikse fooi sal aangekondig word in *Encephalartos* alvorens die jaarlikse kolleksie datum.

DATUM: _____ HANDTEKENING: _____

STRATCOL VERW. 0 0 0 0

ENCEPHALARTOS

INSTRUCTIONS TO AUTHORS

Contributions may be written in English or Afrikaans. Manuscripts must be typed. Short communications and letters to the editor may either be typed or in legible handwriting. All pages of a manuscript must be numbered consecutively. Photographs should be of excellent quality with clear details and adequate contrast. Authors are welcome to send illustrations in electronic format with the following requirements:

- Scan at 300 dpi.
- Save as jpeg, using maximum file size (i.e. minimum compression).
- Send by e-mail to **wynand@ananzi.co.za** and mark 'For Encephalartos'.

The tables and figures/photographs of a manuscript should be numbered and all tables should have a heading. All figures and photographs should have a legend. All figures/photographs should bear written on the reverse the name of the author, figure number and the top of the figure or photograph.

Formal descriptions of new cycad taxa and new name combinations may be published in ENCEPHALARTOS. Authors are however, advised to rather publish such articles in the journal *Novon* which has been established especially for such articles. Articles on potential new cycad taxa, without formally describing them as new taxa, may also be published in ENCEPHALARTOS. To avoid any possible confusion of names of such taxa in future, they should be designated for example by terms such as Species A or Species 99. Do not ascribe provisional names to potential new cycad taxa.

Contributions should reach the editor not later than:

March issue	: First week of January
June issue	: First week of April
September issue	: First week of July
December issue	: Last week of September

One copy of the ENCEPHALARTOS issue in which a contribution appears, will be supplied gratis to all non-member authors.

Note: If applicable, all figures and photographs will be reduced or enlarged to fit over either one, two or three columns when printed.

Tariffs for advertising in ENCEPHALARTOS:

Page size	Black and white	Colour
Quarter page	R175	R250
Half page	R350	R500
Full page	R700	R1000

Members: up to quarter page free of charge—black and white only.

To advertise in ENCEPHALARTOS, contact the Secretary Treasurer and/or Editor.

VOORSKRIFTE AAN OUTEURS

Bydraes kan in Afrikaans of Engels geskryf word. Manuskripte moet getik wees. Kort mededelings en briewe aan die redakteur mag getik of in duidelik leesbare handskrif wees. Nommer alle bladsye van 'n manuskrip opeenvolgend. Foto's moet van goeie gehalte wees, voldoende kontras besit en besonderhede duidelik toon. Skrywers is welkom om illustrasies in elektroniese formaat te stuur, met die volgende vereistes:

- Skandeer teen 300 dpi.
- Stoor as jpeg, maksimum lêergrootte (d.w.s. minimum kompressie).
- Stuur per e-pos na **wynand@ananzi.co.za** en merk 'Vir Encephalartos'.

Die tabelle en figure/foto's van 'n manuskrip moet genommer wees en elke tabel moet 'n opskrif hê. Alle figure en foto's moet 'n onderskrif hê. Agter op elke figuur/foto moet die naam van die outeur en die nommer van die figuur/foto geskryf word en die bopunt van die figuur of foto moet aangedui word.

Alhoewel die formele beskrywing van nuwe broodboom taksons en nuwe naamkombinasies in ENCEPHALARTOS opgeneem kan word, word daar aanbeveel dat sodanige artikels eerder in die tydskrif *Novon*, wat spesiaal vir sodanige artikels in die lewe geroep is, gepubliseer word. Artikels oor potensiële nuwe broodboomtaksons kan ook opgeneem word in ENCEPHALARTOS sonder dat die artikels die nuwe takson formeel beskryf. Om latere moontlike naamsverwarring van sodanige taksons tot die minimum te beperk, moet die potensiële nuwe takson in die artikel deur terme soos byvoorbeeld Spesie A of Spesie 99 aangedui word.

Bydraes moet die redakteur voor of op die volgende datums bereik:

Maart-uitgawe	: Eerste week van Januarie
Junie-uitgawe	: Eerste week van April
September-uitgawe	: Eerste week van Julie
Desember-uitgawe	: Eerste week van September

Een eksemplaar van die ENCEPHALARTOS uitgawe waarin 'n bydrae verskyn, sal gratis aan alle nie-lid outeurs voorsien word.

Nota: Waar van toepassing, sal alle finaal gedrukte figure en foto's verklein of vergroot word om oor óf een, twee óf drie kolomme te pas.

Tariewe om in ENCEPHALARTOS te adverteer:

Bladsy grootte	Swart en wit	Kleur
Kwart blad	R175	R250
Half blad	R350	R500
Vol blad	R700	R1000

Lede: tot 'n maksimum van 'n kwartblad gratis—slegs swart en wit.

Om in ENCEPHALARTOS te adverteer, kontak die Sekretaris-tesourier en/of Redakteur.