Journal of the Cycad Society of South Africa

ENCEPHALARTOS

Tydskrif van die Broodboom Vereniging van Suid-Afrika

No. 99 March 2010 ISSN 1012-9987

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On the cover:

The cover shows a female cone of *Encephalartos lebomboensis*. Photograph by Xander de Kock.

CONTENTS

Disclaimer

This issue is unfortunately late due to a change in editors. We hope to have the 100th issue of our journal delivered to you in good time. Anybody with contributions to this special edition should send it in as soon as possible.

No. 99 **March 2010** **ISSN 1012-9987**

VAN DIE PRESIDENT / FROM THE PRESIDENT

Die jaar 2010 is in volle gang en vir Suid-Afrika is die wêreldbeker om die draai en ons Suid-Afrikaners gaan die doemprofete verkeerd bewys. Vir die Vereniging is daar ook belangrike mylpale met die finalisering van die nuwe grondwet, asook Encephalartos 100 later in die jaar.

My broodbome het pragtig blare gestoot en heelwat keëls. Ek het weer besef dat die aanskaffing van jong plante baie bevredigend is en mens nie nodig het om met volwasse plante te begin versamel nie. Van die plante wat keëls stoot die jaar was verskeie aangeskaf as jong saailinge. Een van die plante (foto 1) is 'n *Encephalartos cerinus* wat ek in 1996 as geskenk ontvang het van Danie en Avis Nel. Hulle het vir my 'n vuurhoutjie boksie gegee met 6 pitte in, waarvan 4 gegroei het. Van die ander plante (foto2) is 'n *E. lebomboensis*, Piet Retief vorm, wat geskenk was deur Dr. Isabella Claasen in 1991. Sy het die dag van ontkieming, naamlik 12/1/1991, op die naamplaatjie gemerk.

Philip Rousseau, van die Universiteit van Johannesburg, is besig met sy meestergraad onder leiding van die bekende Prof. Michelle van der Bank. Sy is die plant genetikus wat begin het met die identifikasie van bome met die gebruik van die *matK* geen. Philip is nou besig om die *matK* geen (en ander) te gebruik om te sien of hulle broodbome, spesifiek *Encephalartos*, tot op spesievlak sal kan identifiseer. Hierdie is baie opwindend en as dit werk hoort dit die raaisel op te los oor die ware identifikasie van plante soos *E. brevifoliolatus*, *E. relictus* en selfs *E. aplanatus*. Lees Philip se artikel in die uitgawe en ons sal julle defnitief op hoogte hou met sy vordering.

Die meeste streke het reeds bymekaar gekom en doen volledig verslag in hierdie uitgawe. Die beskikbare jaarprogramme van die streke word weer in die uitgawe geplaas en ek moedig al ons lede aan om ten minste een vergadering/uitstappie in 2010 by te woon.

Die wenner van "Cycads of Vietnam", geskenk deur Roy Osborne en Wynand van Eeden, vir die beste artikel of bydrae vir ENCEPHALARTOS in 2009 gaan aan Mike Hurter. Hy het verskeie bydraes gelewer in al die 2009 uitgawes en ek het almal baie geniet. Baie geluk en doen so voort. Ons het 'n kopie van Prof. Nat Grobbelaar se boek, "Broodbome" as prys vir die beste artikel of bydrae vir 2010.

Geniet jul broodbome in 2010, deel die vreugde en kennis met ander en skenk 'n saailing aan 'n nuweling.

Groete
Xander de Kock

The year 2010 is in full swing with the World Cup around the corner and we as South Africans have a lot to proof to the world. The Society also has important milestones with issue 100 of Encephalartos later this year and the finalization of the new constitution.

My cycads outperformed themselves this year with beautiful flushes of leaves and cones. Several of my plants that coned this year were acquired as seedlings. I realized once again that you don't need to acquire big plants when one starts collecting. One of these plants (photo1) is an *Encephalartos cerinus* that I received as a present from Danie and Avis Nel in 1996. They gave me a matchbox with 6 seeds in, as a going-away present, when I moved from Durban to Polokwane. Four of them germinated and the above mentioned plant was the first to cone. Another plant (photo2) is a *E. lebomboensis*, Piet Retief form, that I received from Isabella Claasen in 1991. Isabella had the habit of marking the date of germination on the tag and this plant germinated on 12/1/1991.

Philip Rousseau is a master student under the leadership of Prof. Michelle van der Bank of the University of Johannesburg. She is the well-known plant biologist that is using DNA barcoding to identify trees using the *matK* and other genes. Philip is currently busy using this *matK* and other genes to identify cycads, especially *Encephalartos*, down to species level. This is extremely exciting news and if they manage it, the riddles around the identity of cycads like *E. relictus*, *E. brevifoliolatus* and even *E. aplanatus* would be resolved. Read Philip's article for more detail and watch the following issues for more information.

Most of the regions had their 1st meeting, see their reports and programs for the remainder of the year. I dare every member of the society to make a conscious effort to attend at least one outing this year.

The winner of the "Cycads of Vietnam", donated by Roy Osborne and Wynand van Eeden, for the best article in ENCEPHALARTOS in 2009, goes to Mike Hurter. Mike, well done, I enjoyed them all and keep up the good work. We acquired a "Cycads" by Prof. Nat Grobbelaar for the best article in 2010.

Enjoy your cycads in 2010, share your knowledge with fellow collectors and donate a seedling to a greenhorn.

Regards
Xander de Kock

FIRST ANNOUNCEMENT
THE 9TH INTERNATIONAL CONFERENCE ON CYCAD BIOLOGY (CYCAD 2011)

Fairylake Botanical Garden, Shenzhen, P. R. China
1-7 December 2011

The 9th International Conference on Cycad Biology (CYCAD 2011) will be held at Shenzhen Fairylake Botanical Garden, Shenzhen, Guangdong, People Republic of China, from December 1 to 7, 2011. All cycad experts, conservationists, horticulturalists and cycad enthusiasts from around world are welcome to this great event held triennially.

An exciting program of lectures, panel discussions, poster presentations, workshops, and social events will be organized. Field trips to wild cycad sites of one to two weeks will be arranged for those who want to visit important cycad localities after the conference.

The following dates highlight the event calendar:
First announcement: Before 31 March, 2010
Second announcement and call for abstracts: 1 January, 2011
Deadline for abstracts: 31 July, 2011
Deadline for registration on website: 31 August, 2011

Further enquiries to Dr. Nan LI (cycadchina@gmail.com), Professor, Shenzhen Fairylake Botanical Garden, Member of IUCN-SSC Cycad Specialist Group.

For updates see the conference website (http://www.cycad2011.com)

BROODBOOM SAAILINGE VERKOPING EN GARDEN EXPO

LOWVELD BRANCH - S.A. CYCAD SOCIETY
♦
LAEVELD TAK - S.A. BROODBOOM VERENIGING

DATUM: 7 Augustus 2010
PLEK: Laerskool Laeveld Sportgronde
H/V Allibama en Banket str. NELSPRUIT

Kom geniet die dag saam met ons, van vroeg tot laat

Duisende BROODBOOM SAAILINGE word te koop aangebied PRYSLYSTE VOORAF BESKIKBAAR.
BEGINNERS PAKKETTE
BUITEVELD: Vlooimark, Kos stalletjies, Tuin uitstallers ens.

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NEWS FROM THE LOWVELD BRANCH

Program for 2010

14 February 2010 - 1st Quarterly meeting in Barberton
16 May 2010 - 2nd Quarterly meeting at the farm of Roelie van Rooyen
30 May 2010 - Viewing Cycad gardens in Pongola and Piet Retief
10 & 11 July 2010 - Visit *E. heenanii* in Swaziland
7 August 2010 - Lowveld Branch Cycad Sale at Laeveld Primary School Nelspruit
12 September 2010 - 3nd Quarterly meeting at Krokkedil Lapa, Malelane
14 November 2010 - 4nd Quarterly meeting with year-end function at the Farm of Stan Spear

Dirk van der Walt

NOORDELIKE BROODBOOM WERKSGROEP

Die lede van die Noordelike Broodboom Werksgroep (foto 1) het Saterdag 6 Maart 2010 by Jan en Elize Odendaal gaan kuier. Alhoewel ons nie 'n spesifieke spesie bespreek het nie was die uitruil van gedagtes rondom peste en voortplanting van broodbome van hulp tot al die lede teenswoordig. Dis werklik verblywend dat die lede so bereidwillig is om kennis met mekaar te deel, selfs van die ervare lede het weereens nuwe idees gekry.

Ons groep is besonder geseën met baie ervare lede en ek kan alle nuwe en selfs ou lede in Limpopo aanmoedig om ons byeenkomste by te woon. Die lede van die vereniging is werklik vrymoedig om kennis te deel en die gasvryheid verras my keer op keer.

Betreffende die opbou van kennis is daar geen beter wyse as ervaring deur na ander lede se plante te kyk nie, die ervare lede deel graag hulle kennis.

Voorlopige jaar program vir 2010

6 Maart

Ons beplan om Jan Odendaal se tuin te besoek in Nylstroom

Verdere inligting sal later deur gegee word.

Augustus

Ons gaan die een, en heel waarskynlik die laaste een, *Encephalartos hirsutus* plant besoek in die natuur in die Soutpansberg.'n Tuinbesoek by 'n lid in daardie omgewing word ook beplan. Verdere inligting sal deur gegee word soos dit beskikbaar raak.

Piet de Bruyn

NEWS FROM THE CENTRAL REGION BRANCH

The annual general meeting was held on 27 Febuary 2010 in Mooinooi at Mnr R van Wyk farm. At least 64 members attended the meeting where a new committee was chosen to organize meetings and weekends for members. The following members were elected to the committee.

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Members must please contact the committee members if they have any questions or proposals regarding any information re: cycads. We hope to make this year a year of learning, as well as interesting.

Heartfelt thanks.
John Evert.

SENTRAAL STREEK UITSTAPPIE

Die Sentraaltak het 'n besoek aan oom Roelof van Wyk se versameling broodbome gereel, wat toe plaasgevind het op 27/ 02 /2010. Wat 'n verrassing was dit nie vir almal om so baie broodbome te sien waarvan daar 'n groot hoeveelheid plante was wat gekeël het nie. Almal het dit geniet om deur die netjiese tuin te kon loop, fotos te neem, besigtig en verskillende plante te bespreek nie. Wat dit nog meer interresant gemaak het was die kompetiesie wat gereel was nl. om die aantal vroulike plante te identifiseer wat gekeël het en die hoeveelheid keëls wat hulle gedra het. Niemand was reg nie en daar is toe geloot tussen drie persone met die wenner Johan

Snyman wat as prys 'n *Encephalartos nubimontanus* kon huistoe neem.

Die verrigtinge het begin met 'n verwelkoming deur John Evert wat oom Roelof toe aan die woord gestel het. Daar is 'n paar voorstelle gemaak waaroor daar heerlik geredeneer is nl.:

1. Is dit geregverdig dat twee lokaliteite van *E. lebomboensis* (Piet Retief en Mananga vorms) onder dieselfde naam behoort geklassifiseer word?

2. Is *E. brevifoliolatus* werklik 'n aparte spesie of behoort dit tog maar einlik tot die *E. laevifolius* groep?

Diekie de Klerk van die Noordelike Broodboom Werksgroep het sy kennis van E. brevifoliolatus met pragtige voorbeelde van blare wat hy saam gebring het, met ons kom deel.

Teen die middag was almal gereed om hulle vleis op die kole te sit en te geniet saam met 'n verskeidenheid brood met tuisgemaakte konfyt en slaaie. Na die heerlike kuier is die groep uitmekaar met genoeg kennis om te gaan herkou en 'n broodboom tuin om oor te gaan droom.

Broodboom groete
Dion du Toit

BROODBOOM IDENTIFISERINGSKURSUS 22 TOT 24 FEBRUARIE 2010 TE KIRSTENBOSCH / CYCAD IDENTIFICATION COURSE HELD AT KIRSTENBOSCH FROM 22 TO 24 FEBRUARY 2010.

FROM THE COUNCIL

Op 19 Oktober het 'n beampte van Natuurbewaring Wes-Kaap 'n e-pos aan die Sekretaris van die Broodboom Vereniging van SA in Pretaria gestuur om te verneem of die Vereniging nie 'n broodboom identifiseringskursus kan aanbied nie of weet van iemand wat so 'n kursus kan aanbied. Die versoek is na die Wes-Kaap Tak van die broodboom vereniging verwys. Die dagbestuur van die Wes-Kaap Tak het die aangeleentheid bespreek. Die Sekretaris van die Tak het verskillende moontlikhede ondersoek. Daar is met 'n paar persone binne die Broodboom Vereniging kontak gemaak om sodanige kursus aan te bied. 'n Aanbeveling is aan Natuurbewaring gemaak om die dienste van Adolf Fanfoni te bekom om die identifiseringskursus te Kaapstad aan te bied.

Alle verdere reëlings vir die kursus is deur Natuurbewaring gedoen. 'n Plantkundige van Kirstenbosch Botaniese Tuine Mnr. Phakamani Xaba is by die reëlings betrek. Hy het gereël vir die lesingsaal en ander fasiliteite te Kirstenbosch. Twee van die Botaniese Tuin se werknemers wat in die Botaniese Tuin se broodboom kwekery

During October 2009, the Department of Nature Conservation, Western Cape Branch contacted the Society with the request that "we" provide training for their staff in the identification of cycads. Adolf Fanfoni, a cycad grower of Pretoria was contacted and he agreed to present the course.

Kirstenbosch Botanical Gardens provided the venue. Two of the Gardens' staff as well as ± twenty Nature Conservation officials who came from as far afield as Van Rhynsdorp, Riversdale, Stellenbosch and Malmesbury attended the course. Frikkie Conradie, the chairperson of the Western Cape Region of the Cycad Society was also invited by Adolf to attend.

Adolf went out of his way to make the course as informative as possible. To this end, he drew up a training manual and brought along at least one leaf of each species he discussed. As evidenced in Figure 1, the delegates were able to see and handle each specimen.

Figuur / Figure 1.—: Adolf Fanfoni met een van die broodboom blare / Adolf with one of the cycad leaves.

werk en met die broodbome gemoeid is, het saam met meer as twintig Natuurbewarings beamptes die kursus bygewoon. Die aanbieder, Adolf Fanfoni, het vir Frikkie Conradie, voorsitter van die Wes-Kaap Tak, genooi om as gas die kursus by te woon.

Kursusgangers van so ver as Van Rhynsdorp, Riversdal, Stellenbosch en Malmesbury het die identifiseringskursus bygewoon.

Adolf Fanfoni het werklik baie moeite gedoen om die kursus so interessant en prakties moomltik te maak. Hy

Figuur / Figure 2.—: Een van Adolf Fanfoni se opleidingshulpmiddelle wat hy self ontwerp en saamgestel het / One of Adolf's training aids which he designed and compiled.

On Figure 2 one of Adolf's training aids can be seen. Each attendee was presented with a copy of his cycad manual. It consists of approximately 160 pages and the contents are presented in layman's language.

Adolf also brought along five seedlings for identification purposes. Figure 3 shows E inopinus with its unique form. At the conclusion of the course, Adolf donated the

Figuur / Figure 3.—: Adolf Fanfoni se saailinge wat vir uitkenningsdoeleindes gebruik is / The seedlings which were used for identification purposes.

Figuur / Figure 4.—: Tydens Adolf Fanfoni se aanbieding het kursusgangers aanvullende nota's gemaak. Vir sommiges het die dag net te lank geraak / Delegates taking notes during the course – which was a bit too long for some.

Figuur / Figure5.—: Tydens evaluering moes die saailinge geidentifiseer word / The seedlings being evaluated.

het 'n blaar van elke spesies wat behandel is al die pad vanaf Pretoria saam gebring. Soos gesien kan word op Figuur 1, verduidelik hy al die belangrike eienskappe waarop gelet moet word tydens identifisering. Kursusgangers kon sien en voel hoe elke spesies se blaar lyk en voel.

Op Figuur 2 kan een van Adolf se opleidingshulpmiddels wat hy self ontwerp en saamgestel het, gesien word. Sy handleiding van plus minus honderd en sestig bladsye, waarvan elke kursusganger 'n eksemplaar gekry het, is op goeie glanspapier gedruk. Die inhoud daarvan is vir die leek maklik verstaanbaar saamgestel. Die spesies daarin is alfabeties behandel. Tydens die uitkenningsfase in die Botaniese Tuin, was dit dus maklik om 'n spesies gou na te slaan.

Adolf se saailinge wat ook vir uitkenningsdoeleindes gebruik is, is te sien op Figuur 3. Die *E. inopinus* met sy kenmerkende vorm, staan soos 'n paal bo water uit. Na die kursus het Adolf die vyf saailinge (met die nodige permit) aan die Wes-Kaap Tak geskenk.

Van die kursusgangers verskyn op Figuur 4. Tydens Adolf Fanfoni se aanbieding het kursusgangers aanvullende nota's gemaak. Vir sommiges het die dag en Kaapstad se somersweer, net te lank geraak.

En wat is 'n kursus sonder 'n eksamen. Tydens die evaluering moes die saailinge geidentifiseer word. Op Figuur 5 kan gesien word hoe die kursusgangers om die saailinge saamdrom. Die saailinge is bekyk en bevoel. Daar is aan die vingers geruik om te bepaal of een plant nie moontlik daardie kenmerkende ruik van *E. cerinus* het nie. Die oë het gesoek na daardie kenmerkende "deurmekaar" blare van *E. Caffer*. Plus minus veertig ander vrae moes ook beantwoord word.

Woensdag die 24ste moes die kursusgangers hul nuutverworwe kennis in die pragtige broodboom tuin van Kirstenbosch toepas. Vir die wat aandagtig geluister het en aanvullende notas gemaak het, was die uitkenning sommer maklik. Hierdie pragtige vroulike *E. ghellinckii* in die tuin (Figuur 6) is tydens die praktiese fase sommer baie maklik geidentifiseer.

Soos gebruiklik is die nodige groep foto (Figuur 7) na die kursus geneem. Na die middagete is totsiens gesê en

seedlings, together with their permits to the Western Cape branch of the Society.

A number of the delegates appear in Figure 4. For some the hot summer's day was just too long.

And what is a course without an exam – it consisted of approximately eighty questions. During the evaluation, the seedlings had to be identified. Figure 5 shows the delegates inspecting the seedlings. The plants were studied, touched, and fingers sniffed for the characteristic odor of *E. Cerinus*.

On the last day of the course, the students had to test their newly acquired skills on the cycads in the beautiful gardens of Kirstenbosch. For those who paid attention and made their own notes, the identification process

Figuur / Figure 6.—: Die kursusgengers het hierdie *E. ghellinckii* in die tuin tydens die praktiese fase sommer baie maklik geidentifiseer / *E. ghellinickii* being identified.

Figuur / Figure 7.—: Soos gebruiklik is die nodige groep foto's na die kursus geneem / The delegates.

kursusgangers wat van ver gekom het, moes die lang pad huis toe weer aanpak.

Ek kan met eerlikheid sê dat ek die kursus geniet het en baie daaruit geleer het.

En soos die lewe nou maar eenmaal is, onvolmaak, met sy hoogte punte en laagte punte, het dit net een beampte met 'n gebrek aan diskressie, geneem om 'n baie suksesvolle kursus te bederf. Waar ekself, Adolf en Phakamanie by Adolf se voertuig saamgekom het, wou meneer die Kapokhaantjie weet of Adolf die nodige permitte by hom het vir die blare en saailinge wat hy vervoer het. Adolf moes ook daar en dan alle besonderhede aan mnr Kapokhaantjie verskaf. Sekerlik moes Adolf verkleineerd gevoel het om in my en Phakamanie se teenwoordigheid gekonfronteer te word. Na al die moeite wat Adolf gedoen het om die kursus interessant en so prakties moontlik te maak, verdien hy nie sulke behandeling van 'n kursusganger wat Natuurbewaring verteenwoordig nie. Proaktiewe optrede sou gewees het om tydens die reëling van die kursus dit onder die aanbieder se aandag te bring, dat alhoewel die kursus vir Natuurbewaring is, daar nogtans aan alle wetgewing voldoen moet word. Met sulke optrede en'n gebrek aan diskressie, sal bewaringsbeamptes nooit die samewerking van die broodboom versamelaars wen nie. Sekerlik dra sulke optrede ook nie by tot die bewaring van ons kosbare erfenis nie.

Frikkie Conradie

was relatively easy. The impressive female *E. ghellinickii* – Figure 6 – was relatively easy to spot.

As can be expected, a group photo – Figure 7 – was taken of the delegates and after lunch farewell was said as some had a long way to travel.

I can honestly say that I enjoyed the course and benefited tremendously from it.

An unfortunate incident took place as we were seeing Adolf off on his almost 1500 km trip back home. One of the Nature Conservation officials approached Adolf, enquiring if he had the necessary permits to transport the leaves and seedlings. Adolf had to explain to this person that, being a registered grower, he was empowered to issue the required permits. I am sure that Adolf must have felt insulted to be approached in such a manner in front of myself and Mr Phakamani from Kirstenbosch; especially after all the trouble he went to instruct this person's colleagues in matters of cycad identification. A proactive step would have been to advise the presenter, that even though the course is being presented for the benefit of Nature Conservation officials, it was still necessary to abide by all regulations relating to protected species. Unfortunately the actions by this official and his lack of discretion will not elicit the co-operation of cycad enthusiasts and neither does it contribute to the conservation of our precious heritage.

Frikkie Conradie

WES-KAAP TAK: TUINBESOEK 23 JANUARIE 2010 / GARDEN VISITS BY MEMBERS OF THE WESTERN CAPE BRANCH ON 23 JANUARY 2010.

Figuur / Figure 1.—: Hans (met die groen hoed op) aan die woord en almal luister aandagtig / Hans (wearing the green hat) speaking to the visitors.

Daar is vir die lede van die Wes-Kaap Tak twee tuinbesoeke op 23 Januarie 2010 gereël. Die eerste tuin wat besoek is, was die van Hans en Hester Viljoen. Daarna het het almal die tuin van John van Huffel besoek.

Die gevoel onder lede is dat die heel beste opleiding en uitruil van inligting, tydens informele gesprekke en tuinbesoeke plaas vind. Hans se interessante stories oor sy tuin het almal geboei. Op Figuur 1 is Hans aan die woord en almal luister aandagtig. Hulle tuin is nie verniet 'n wentuin in die jaarlikse tuinkompetisie nie, goeie uitleg en sinvolle beplanning sorg vir inspirasie en die kombinasie met veskillende soorte broodbome sorg vir 'n rolmodeltuin.

Toon Figuur 2 'n nuwe broodboom kewer? Nee, Hans se vrou Hester, is baie kunstig en het 'n verskeidenheid van hierdie kewers uit droë broodboom blare en ander plandmateriaal gemaak wat as versierings in Hans se "kweekhuis" rond hang. Wys net wat mens met daardie ou broodboom blare kan maak. Haar kunstigheid het verder na vore gekom in die heerlike verversings wat sy en Hans vir ons voorgesit het. Die besoek by Hans is afgesluit met heerlike eetgoed, drinkgoed, tonne gasvryheid en die Tak se kwartaalikse vergadering.

Die tweede tuin wat die dag besoek is, is die van Jonn van Huffel. Figuur 3 toon John (met die blou hoed op) hard aan te vertel en te verduidelik oor die plant en almal luister aandagtig na hom. Leslie (met die blaar agter sy rug) het nie die blaar afgebreek nie, maar saamgebring om met John se plant te vergelyk.

Figuur 4 toon John se vier *Encephalartos latifrons* plante waarop hy baie trots is. Dit word in sy agterplaas "weggesteek" en ek verneem hy het glo 'n goeie aanbieding vir een van hierdie plante gekry. As jy dalk op soek is

Two garden visits were arranged for members. The first was to Hans and Hester Viljoen and the second was to John van Huffel.

The feeling amongst members is that the best training and exchange of information occurs during informal discussions and visits to gardens. On Figure 1 Hans has the attention of the visitors with his intriguing stories. This garden is a finalist in the annual garden competition. Its planning and meaningful layout serves as an inspiration for others.

A new cycad pest? No, Hester is very artistic and made various "insects" (Figure 2) from dry cycad leaves and other plant material, which serve as ornaments in the hothouse. Just shows what can be done with old cycad leaves. Her artistic flair was also exhibited in the tasteful refreshments which were provided.

At his garden it was John van Huffel (Figure 3) explaining the features in his garden. Leslie (with a leaf behind his back) brought it along to compare it with one of John's plants.

John's four *E. latifrons* plants (Figure 4) of which he is very proud. They are hidden in his rear garden. I believe somebody made John a good offer for one of the plants.

An impressive female *E. nubimontanus* (photo 5) with three cones. The male plant has also produced two cones. It is hoped that the pollen will be available in time in order to fertilise the female cones which cannot go to waste. John is a registered grower and to his dismay, some vandals broke off a female *E. msinganus* cone, shortly after it had been pollinated.

The members of the Western Cape branch would like to thank both John and Hans who opened up their gar-

Figuur / Figure 2.—: Kewers uit droë broodboom blare en ander plandmateriaal gemaak deur Hester Viljoen / The artistic insects made by Hester Viljoen.

na 'n *E. latifrons*, kontak vir John. Wie weet, dalk verkoop hy nog een aan jou.

En kyk net op Figuur 5 hoe pragtig keël hierdie vroulike *E. numbimontanus*. John se manlike numbimontanus stoot ook twee keëls. Ons vertrou dat die stuifmeel betyds gereed sal wees om die vroulike plant te bestuif. Indien nie, sal John beslis na stuifmeel moes soek. 'n Man kan mos nie 'n *E. numbimontanus* keël nie bestuif nie. John is 'n geregistreerde kweker en kweek graag plante as saad beskikbaar is. Tot sy groot teleurstelling het kwaaijongens onlangs in sy voortuin die vroulike keel van sy *E. msinganus* afgebreek, kort nadat hy die plant bestuif het. John se versameling is bykans volledig. Feitlik elke *Encephalartos* spesie kan in sy tuin gevind word.

Lede van die Wes-Kaap Tak wil hiermee ook baie dankie sê aan Hans en John wat hul tuine oopgestel het vir ons besoek. Elke lid het iets nuuts geleer uit die besoeke en die dag terdee geniet. Ek wil ook graag almal wat in die Wes-Kaap woonagtig is en hierdie artikel lees, uitnooi om by die Tak se aktiwiteite betrokke te raak.

Johan Kotze
(Foto's deur Frikkie Conradie)

Figuur / Figure 3.—: John (met die blou hoed op) hard aan te vertel en verduidelik / John van Huffel (with blue hat) explaining a feature in his garden.

Figuur / Figure 4.—: John se vier *E. latifrons* plante / John's four *E. latifrons* plants.

dens for the visits. I am sure that each member learned something new and thoroughly enjoyed the outing.

In conclusion, I would like to encourage all members resident in the Western Cape, who read this article, to take part in future activities of the branch.

Johan Kotze
(Photo's by Frikkie Conradie).

Figuur / Figure 5.—: Vroulike *E. numbimontanus* in John se tuin / An impressive female *E. nubimontanus*.

NEW MEMBERS

The Society welcomes the under mentioned new members who joined betweeb October, 2009 and March, 2010.

As a result of comments received by the secretary, full addresses will no longer be published, in consideration of member's safety.

3662 W	EHRKE, Mnr G E	DURBANVILLE, 7551
3663	WISBAR, P	BAD NAUHEIM, Germany
3664 G	LAUBSCHER, Mnr A	WIERDA PARK, 0149
3665 K	DIPPENAAR, Mnr G A	St LUCIA, 3936
3666 G	STOCKENSTRÖM, Mr D	EAST RAND, 1462
3667 G	STOCKENSTRÖM, Mr N	EAST RAND, 1462
3668	BERTSCHY, Mr K	SAN DIEGO, CA 92116, USA
3669 G	FLOOK, Mr B A	BENONI SOUTH, 1502
3670 G	BURGER, Mnr P L	PIERRE VAN RYNEVELD, 0045
3671 G	DE WET, Mrs S C	GARSFONTEIN EAST, 0060
3672 L	ENVIROXCELLENCE SERVICES	POLOKWANE, 0700
3673 K	GALTREY, Mr T K	MTUBATUBA, 3935
3674 G	BOTES, Mr H	MONTANA PARK, 0159
3675 W	HEN-BOISON, Mr J	BETTY'S BAY, 7141
3676 G	HEUNIS, Mev K B J	VAALPARK, 1948
3677 M	HOLTZHAUSEN, Mr R & Mrs L	MALELANE, 1320
3678 G	JACOBY, Mr E	KLERKSDORP, 2570
3679 G	KNOETZE, Mnr R	DOORNPOORT, 0017
3680	PINETUM BLIJDENSTEIN	HILVERSUM, The Netherlands
3681 K	SANDSTONE INVESTMENTS CC	GILLITTS, 3603
3682 G	SMITH, Dr C de J	PRETORIA NOORD, 1028
3683 G	VAN HEERDEN, Mr C	RHODESFIELD, 1619
3684 W	VISSER, Mnr P	ROGGEBAAI, 8012
3685 L	WILLIAMS, Mnr B & Mev H	MOKOPANE, 0600
3686 G	WOBBE, Mr E A F	BEDFORDVIEW, 2008
3687	CLARK, Mr I	MAIDSTONE, Kent, ME15 6EP, England
3688	DENGLER, Mr M	PASSAU, 54036, Germany
3689 W	NIEUWENHUIZEN, Mnr P	STRAND, 7140
3690 G	ALBERTS, Mnr W F	KARENPARK, 0118
3691 G	BOTHA, Mev E M S	FLORIDA, 1710
3692 G	HONEYBOURNE, Mr D C P	RAYTON, 1001
3693 G	JEDRZEJCZAK, Mr M	OLIVEDALE, 2158
3694 G	STORM, Mnr H J	MONUMENTPARK, 0105
3695 G	VILJOEN, Mnr B	HERCULES, 0030
3696 G	BOTHA, Mr M	HIGHVELD, 0169
3697 K	BOREHAM, Mr M A	MONTROSE, 3201
3698 N	BOSHOFF, Dr C & Mev E	RUSTENBURG, 0300
3699 G	JOYCE, Dr C K	FAERIE GLEN, 0043
3700 G	KRIEL, Mnr H	ELDORAIGNE, 0157
3701 G	SMAL, Mnr E C	MOOIKLOOF, 0059
3702 G	VISSER, Mev D	WATERKLOOF GLEN, 0010
3703	KLEIN, Mr A	VISTA, CA 92084, U S A
3704	MASILKO, Mr T	PASEDENA, CA 91104, U S A
3705	WAUSCHEK, Mr C	MURRIETA, CA 92563, U S A

NEW PUBLICATIONS

One of the joys of Cycadology is to read about new discoveries in the field. Over the last 40 years numerous publications on cycads of specific regions appeared, yet some key areas are still not covered. In recent months two very important and potentially useful articles were published:

LINDSTROM, A.; HILL, K.D.; & STANBERG, L.C. 2009. The genus *Cycas* (Cycadaceae) in Indonesia.

Telopea **12**(3): 385—418.

Indonesia comprises an archipelago of hundreds of islands stretching east to west, from Sumatra to and including Irian Jaya (western New Guinea), a distance of some 5500 km. These islands have varied topography and thus local climates, and it is somewhat surprising that only ten species of *Cycas* are recognized whereas other plant groups, including palms, are amongst the richest in the world.

It is beyond the confines of this announcement to discuss in detail the morphology, distinguishing characteristics, and geographical distribution of the individual species. The following are recognized: *C. apoa* from northern Iria Jaya and Papua New Guinea, *C. scratchleyana* from eastern Irian Jaya and Papua New Guinea, *C. javanica* from Java, *C. montana* (new species) from higher elevations on Flores, *C. falcata* from Sulawesi and vicinity, *C. rumphii* from the Moluccas, Irian Jaye and Papua New Guinea, Sulawesi, Borneo, Java, and Christmas Island; *C. edentata* from Sumatra, Java, and Borneo but outside the region also in Vietnam, southern Burma, southern Thailand, and the Philippines; *C. sundaica* (new species) from the island group Nusa Tenggara Timur, *C. glauca* from Timor and Sumba, and *C. papuana* from Papua New Guinea.

All these are arborescent plants, but their habitats differ widely. *C. falcate, C. sundaica, C. rumphii,* and *C. edentate* have (like our *C. thouarsii*) a spongy layer inside the sclerotesta of the seed which is thought to play a part in dispersal by floating on sea water.

The article tells us nothing about their reaction to cultivation outside the tropics; but I once had *C. rumphii* which I lost in Stellenbosch, and I still have *C. scratchleyana* which struggles for life.

There is a distribution map, and some line drawings of sporophylls and leaflets; as well as a bibliography.

Delightful accounts of botanizing in this region between 1899 and 1943 can be read in David Fairchild's books *The world was my garden* (1938), *Exploring for plants* (1931), and the provocatively titled *Garden islands of the Great East* (1944).

First author's address: Nong Nooch Tropical Botanical Garden, Sattahip, Chonburi 20250, Thailand.

NICONALDE-MOREJÓN, F.; VOVIDES, A.P.; & STEVENSON, D.W. 2009. Taxonomic revision of *Zamia* in Mega-Mexico.

Brittonia **61**(4): 301–335.

This treatise covers the regions of south-eastern Mexico, Belize, Guatemala, Honduras, an El Salvador, which together constitutes a phytogeographical region. It is immensely rich in *Zamia* species, with 22 known species. Much of this information was previously available in widely scattered articles; but now for the first time the species are treated together and compared in a uniform format. As such it is of great value to anyone interested in *Zamia*.

The authors claim that 18 of the 22 species occur in specific habitats, which accounts for their restricted geographical ranges. Being ignorant of the vegetation terminology for the region I was somewhat taken aback by the habitat descriptions, many of which stated "forest" for vegetation types which we would call savannah in Africa. This has bearing on our not always successful attempts ro grow these plants. In Stellenbosch, admittedly outside the natural climatic regions, most of the plants said to grow in forests pine away and eventually die unless grown I more or less direct sunlight.

Most of the species have the typical habit of solitary underground stems which may branch with age like *Stangeria*, but four species have columnar arborescent stems which may be up to 100 cm tall: *Z. inermis, Z. onanreyesii, Z. soconuscensis*; *and Z. tuerckheimii*.

There is a key for the identification of the species. For each species the place of publication and typification is recorded, there is a comprehensive description, and there are headed paragraphs on chromosome number, diversity and genetic structure, distribution and habitat, derivation of the epithet, distinguishing features, and specimens examined. For most (but not all) of the species there is a beautiful plate of line drawings showing the whole plant as well as distinguishing features such as cones, sporophyls, and leaflets when applicable. At the end of the article is an extensive bibliography, nd two plates of coloured photographs of female cones.

First author's address: Departamento de Biologia Evolutiva, Instituto de Ecologia, A. C. km 2.5 Antigua Carratera a Coatepec No. 351, Xalapa 91070 Veracruz, Mexico.

PÉREZ-FARRERA, N.A.; VOVIDES, A.P.; MARTINEZ-CAMILO, R.; MELENDEZ, N.M.; & IGLESIAS, C. 2009. A re-assessment of the *Ceratozamia miqueliana* species complex (Zamiaceae) of southeastern Mexico, with comments on species relationships.

Systematics and Biodiversity **7**(4): 433–443.

In the northern highlands of Chiapas there are five species of *Ceratozamia* which appeared to be closely related. The purpose of this study was to determine if they are sufficiently different to be recognized at distinct species; and if so, to determine their interrelationships. For this purpose morphological, anatomical, and geographical data were analysed.

The results showed that the five groups are indeed distinct. Useful characteristics to distinguish them from each other are the texture, shape, dimensions, and spacing of the leaflets, the absence or presence of visible veins

on the leaflets; whether the petiole is armed or not, and whether the female cones are erect or not at maturity.

The analysis showed that *C. miqueliana* and *C. euryphyllidia* group together (interesting, as I have seen a photograph of a particularly beautiful artificial hybrid between the two), and *C. santillanii* (see below), *C. zoquorum*, and *C. becerrae* form another group.

C. santillanii is here described as a new species. The description is accompanied by a detailed plate of line drawings showing the entire plant as well as enlargements of pertinent structures.

First author's address: perezfarreram@yahoo.com.mx

CALONJE, M.; MEEROW, A.W.; & STEVENSON, D.W. 2010. The typification of *Zamia erosa* and the priority of that name over *Z. amblyphyllidia*.

An electronic file of this article sent to us stated that it was published in*Taxon* **59** of February 2010, but that is incorrect. We assume that it is still unpunlished, and will publish the reference once at has appeared.

It was found that the plants to which the names *Zamia erosa* and *Z. amblyphyllidia* (previously known as *Z. latifoliolata*) apply, are conspecific. The oldest and correct name is *Z. erosa*.

First author's address: michaelc@montgomerybotanical.org

SINGH, R.; & RADHA, P. 2008. A new species of *Cycas* (Cycadaceae) from Karnataka, India.

Botanical Journal of the Linnean Society **158**: 430—435.

When considering the size, geographical position, topography, and climate of India, it has the characteristics of a cycad-rich region. Yet up to now only five species had been known from the subcontinent. Now Prof. Rita Singh (a long-time member of our Society) and R. Radha has described a sixth species, *Cycas swamyi*. Unusually the stem of this species rends to be strongly dichotomously branched. Additionally it is characterized by a robust habit, anatomically distinct leaflets, and distinct female sporophylls as detailed in the article.

There is a plate of 12 photographs, one of line drawings, amda distribution map.

Figure 1.—: *Zamia sp. meermanii*. - M Calonje

Figure 1.—: *Cycas swamyi*

First author's address: University School of Basic and applied Sciences, Guru Gobind Singh Indraprashta University, Kashmere Gate, Delhi 110 403, India.

rsinghipu@yahoo.co.in

CALONJE, M. 2009. A new cliff-dwelling species of *Zamia* (Zamiaceae) from Belize.

Journal of the Botanical Research Institute of Texas **3**(1): 23—29.

Central America appears to be an inexhaustible source of new *Zamia* species. The subject of this article, *Zamia* meermanii from Belize, is one of only three species of *Zamia* which habitually hang from cliffs and have hanging leaves, the other two being *Z. cremnophila* from Mexico and *Z. sandovalii* from Honduras. Interestingly there are also cliff-hanging species of *Ceratozamia*.

It occurs in a region of high rainfall (2000 to 2500 mm per annum) but with a distinct dry season from February to May, yet the vertical Karst limestone cliff faces on which it occurs must be very well-drained. Surprisingly, in view of its late discovery, it is not a rare species and its geographical range is estimated to be about 1900 square kilometers.

This is a comprehensive article, dealing with aspects such as conservation status, reproductive phenology, and ecology. Interestingly it is said to be most similar in appearance to *Z .furfuracea*. There is a tble as well as a key to compare *Z. meermanii, Z. furfuracea, Z. cremnophila,* and *Z. sandovalii*, as well as two plates of photographs.

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Michaelc@montgomerybotanical.org

Piet Vorster

BOOK REVIEW / BOEKOORSIG

CYCAD WORLD OF INNOVATIONS BY ADOLF FANFONI

Die boek bestaan uit 350 geskrewe bladsye met baie foto's ingesluit. Dit is vir die broodboom liefhebber eerder as die wetenskaplike geskryf. Heelwat verskillende onderwerpe word behandel, o.a. kroonvrot en swamsiektes se behandelings, verskillende vorme van bestuiwings, verwydering van suiers, behandelings van suiers en oorplanting van suiers, om net 'n paar te noem. In hierdie boek kan goeie praktiese wenke geleer word wat sommige van ons dalk jare lank sal neem om op ons eie uit te vind en te bemeester. Deur die boek sorgvuldig deur te lees en die inligting toe te pas, kan jy jouself baie teleurstellings, geld en plante spaar.

Voordele aangaande die uitgawe: Dit bevat kort, kragtig, goeie verstaanbare, nuttige en praktiese inligting. Dit is groot gedruk, wat dit maklik maak om te lees. Die bladsye is van 'n goeie kwaliteit papier.

Nadele: Die boek het geen inhoudsopgawe met bladsy verwysings nie. Dit het ook nie 'n "Glossary of Terms" nie. Min inligting per bladsy in verhouding tot die dikte van die boek. Geen inligting oor Afrika spesies nie, slegs die Suid-Afrikaanse spesies met foto's word behandel. Gemiddelde foto kwaliteit kan beter wees. Skadu kolle op sommige foto's asook foto's wat nie in fokus is nie, verlaag die kwaliteit van die boek. Die prys is aan die duur kant as ander beskikbare broodboomboeke in ag geneem word. Des nieteenstaande die nadele, kan ek nogtans die boek vir broodboom liefhebbers aanbeveel.

Die boek is beskikbaar van Adolf Fanfoni by cycadwofi@lantic.net en die prys is R650-00.

Frikkie Conradie.

The book consists of 350 written pages with plenty of photographs. It was written for the cycad lover rather than the scientist. A Good number of subjects are being discussed like crown rot, treatment of fungi, different methods of pollination, removing of suckers, treatment of suckers and planting of suckers, just to mention a few. This book gives the reader good practical tips, without which, it will take some of us years to discover ourselves. By reading through this book carefully and applying the tips, you can save yourself lots of trouble, money and the loss of plants.

Advantages: Short and to the point, easy to understand, with good practical tips and information, printed large and clear to make reading easy. Pages are of good quality paper.

Disadvantages: The book does not have a proper contents list. Neither does it have a Glossary of Terms. It contains little information per page, relative to the size of the book. No information on Africa species, only South African species, with photographs is described. General quality of photographs can be better. Exposure and focus of some photos are not on standard and gives a negative impression of the book. The book is expensive, especially if you consider the other cycad books currently available. Despite of its disadvantages, I can still recommend this book to cycads lovers.

The book is available from Adolf Fanfoni at cycadwofi@lantic.net and the price is R650-00.

Frikkie Conradie.

ZAMIA LODDIGESII MIQ.

[1]Roy Osborne & [2]Andrew P. Vovides

Introduction

The name *Zamia loddigesii* recognises the botanical and horticultural importance of novel plant introductions made by the Loddiges Nursery at Hackney, near London, during the 18th and 19th Centuries (see box).

An early-known, widespread and morphologically variable taxon, *Zamia loddigesii* has been listed under several other names at the species level (*Z. cycadifolia*, *Z. galeotti*, *Z. lawsoniana*, *Z. leiboldii*, *Z. mexicana* and *Z. sylvatica*), and as varieties (*Z. leiboldii* var. *angustifolia* and var. *latifolia*, and *Z. loddigesii* var. *angustifolia*, var. *cycadifolia*, var. *leiboldii*, var. *longifolia* and var. *obtusifolia*). Early collections of plants from Mexico's Yucatán Peninsula under the name *Z. loddigesii* are now assigned to *Z. polymorpha*.

Discovery

Zamia loddigesii was described by Miquel in 1843 on the basis of leaf material, which we believe originated from plants sourced by the Loddiges nursery in London, and was sent to Miquel by Louis Van Houtte in Belgium. Although no illustration was prepared and there are no details known of the wild origin of this cycad, a voucher, *Van Houtte 3374*, has recently been located at the Utrecht herbarium, and has been designated the lectotype (Nicolalde-Morejón et al. 2009).

Distribution, habitat and ecology

Plants under the broad concept of *Zamia loddigesii* refer to one of the most widespread of the Mexican cycads, with variously large and small populations known from the states of Chiapas, Hidalgo, Oaxaca, Tabasco, Tamaulipas and Veracruz. These populations show considerable diversity and may reflect one very variable species, one species complex, or several discreet species with possible introgression.

Natural hybrids are reported for *Z. loddigesii* x *Z. spartea* and for *Z. loddigesii* x *Z. furfuracea*, the latter on disturbed sites only. Further research is needed to elucidate any of these possibilities.

Following on from his post-graduate studies on this cycad, Bart Schutzman believes that DNA sequencing and microsatellite analysis of these populations, along with much more morphological study and numerical analysis of all the characters, will be necessary before anyone really has a grip on the extent of the species. For

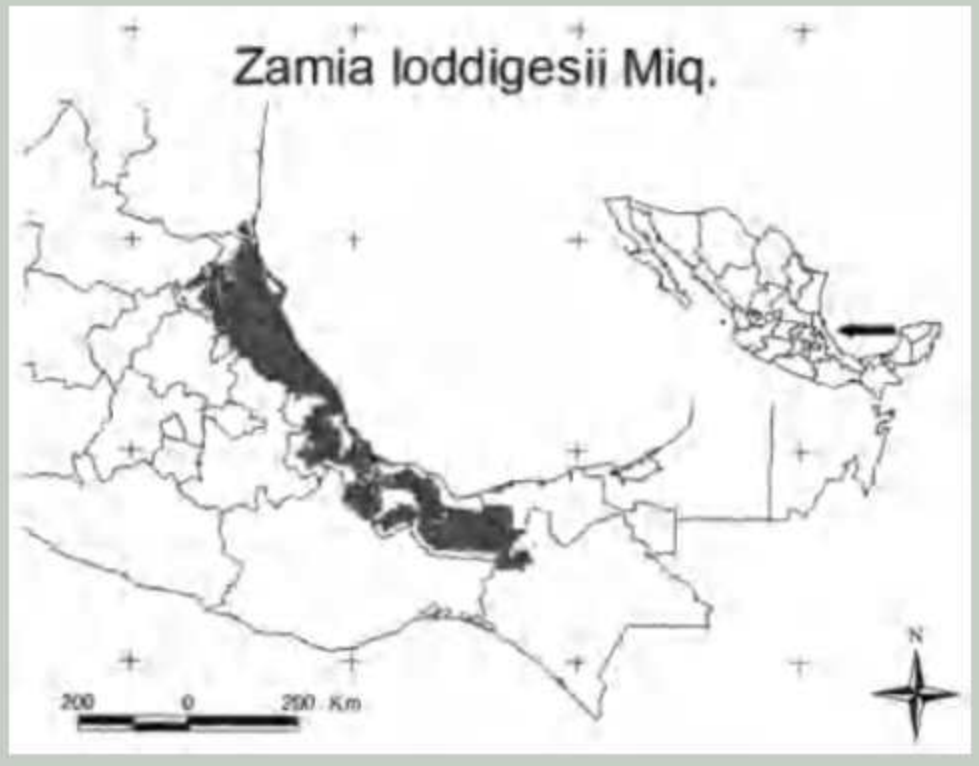

Figure 1.—: *Approximate distribution of the plants currents referred to* Zamia loddigesii.

THE LODDIGES NURSERY

The Loddiges Botanical Nursery was founded by Conrad Loddiges (1738–1826). He was born in Hildersheim, Germany, where his father, Casper Lochlies, was gardener to the Elector of Hanover, George II of England. Conrad emigrated to Britain at the age of 19 during the "Seven Years' War", taking up employment as gardener for an influential medical family in Hackney, north London. It was then that the family name was changed. By his forties, Conrad had married, and had accumulated the knowledge and savings to expand a small seed business started by fellow German emigrant, Johan Busch. He then began to contact people all over the world, urging them to send him packets of seeds collected in their local areas. From these small beginnings, the nursery business gained a specialist market in Britain, and was increasingly able to attract clients from estates and botanical gardens throughout Europe.

The nursery rose to greater prominence during the early 19th century under the direction of Conrad's son, George Loddiges (1786–1846), who built what was said to be the largest hothouse in the world, displaying an astonishing collection of exotic plants of all kinds. George also published a series of 20 volumes with about 2,000 colour plates of rare plants introduced into his hothouses and gardens. He demonstrated a wide interest in all technical matters, linking the nursery into the important scientific circles of the day, and becoming a Fellow of the Microscopical Society, the Linnean Society, the Horticultural Society and the Zoological Society. Abroad, the nursery's influence spread to the imperial gardens of St. Petersburg in Russia, and the Adelaide Botanic Garden in Australia. The Loddiges business closed in the 1850s, leaving a valued legacy in many European botanical gardens and private collections.

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Figure 2.—: The voucher, *Van Houtte 3374*, recently located at the Utrecht Herbarium, which is now designated the lectotype for *Zamia loddigesii*. Image kindly supplied by Dennis Stevenson.

Figure 3.—: Illustration of *Zamia loddigesii* by Elvia Esparza as published in the Flora de Veracruz (1983). The plant depicted here does not show the characteristic petiolar prickles. Reproduced by kind permission of Arturo Gómez-Pompa.

him, the name *Zamia loddigesii* is just one of many that could be attributable to all or part of a large group of populations ranging from Tamaulipas all the way to Chiapas. Alternatively, *Z. loddigesii* may be a "compilospecies", an entity that incorporates features of all species with which it comes it contact, in this case including *Zamia furfuracea*, *Z. paucijuga*, *Z. spartea* and "Z. maritima" (Bart Schutzman, pers. comm.). As mentioned below, many of the original populations have been extirpated and thus complete resolution of this taxonomy may never be attained.

Plants under the name *Zamia loddigesii* grow in a wide variety of habitats including evergreen tropical forest (*bosque tropical perennifolio*), deciduous tropical forest (*bosque tropical caducifolio*), sub-deciduous tropical forest (*bosque tropical subcaducifolio*), their secondary succession stages, and disturbed sites. Altitudes range from near sea-level to almost 1000 m.

The soil is typically derived from calcareous rocks that are prominent in the cycad localitites. The climate hot-humid to sub-humid, with a mean annual temperature in the 24–25°C range. The yearly rainfall varies from around 840 to over 2000 mm depending on locality, falling mainly between June and September, and followed by a 6-month dry season. Trees such as *Bursera simaruba*, *Nectandra sanguinea*, the oaks *Quercus laurina*, *Q. oleoides*, Q. *peduncularis*, and groves of *Brahea dulcis* palms are common. Trees may host epiphytic aroids, bromeliads, cacti and orchids. Smaller shrubs include *Acacia cornigera* and *A. pennatula*.

Insect pollinators for this cycad have been captured but not yet identified to species level; *Rhopalotria* (Coleoptera: Curculionoidea: Belidae) weevils and *Pharaxonotha* (Coleoptera: Erotylidae) beetles are the probable candidates. Similarly, seed dispersal agents for *Z. loddigesii* are not documented but mockingbirds, jays, small rodents and fruit bats may be involved. Larvae of the lycaenid butterfly genus *Eumaeus* are native herbivores of *Zamia loddigesii* and appear to sequester cycad toxins from their host plant as an anti-predator defence. Abnormal butterfly infestations may perturb the plant population dynamics (Castillo-Guevara 2007, as *E. minyas*).

Description, vegetative structures

Zamia loddigesii has a subglobose, subterranean **stem**, 10–45 cm long and 8–15 cm in diameter, older specimens branching to form multi-headed plants. Each stem bears from one to many **leaves** that are erect to spreading in a sparse crown, variously bronze to light green at emergence, becoming medium to dark green, sometimes with a persistent brown tomentum at maturity, 45–96 cm long, 30–41 cm wide, and flat or near so in cross-section (pinna-to-pinna angle 160–180°). The **petiole** is 15–25 cm long, 6 mm in diameter, subterete, green in young leaves, and subtends a rachis bearing 12–23 pairs of leaflets in an opposite to subopposite arrangement, both the petiole

Figure 4.—: Leaflets, believed to be of *Zamia loddigesii*, from a plant in cultivation, showing the leaflet profile and the scattered small teeth in the distal portion. Photo: Roy Osborne.

and rachis moderately to densely armed with prickles up to 4 mm long. **Leaflets** are coriaceous, narrowly to broadly lanceolate, the apex acute, the base attenuate, with margins slightly revolute and with scattered small teeth in the distal 33%; although in some populations some individuals rarely show entire leaflets. **Median leaflets** are 16–26 cm long by 18–31 mm wide. **Cataphylls** are persistent, chartaceous, triangular at the base, aristate at the apex, yellowish tomentose, 8–9 cm long by 3–4 cm wide at the base. **Eophylls** have 2–4 leaflets.

Description, reproductive structures

Zamia loddigesii bears 1–2 **pollen cones** per stem, these are 8–14 cm long excluding the peduncle, 2–4 cm in diameter, erect until pollen dehiscence, cylindrical, with a beige to pale brown tomentum, the apex usually blunt but sometime apiculate, and with a light brown tomentose peduncle 5–7 cm long and about 12 mm in diameter. **Microsporophylls** are cuneiform, about 3 mm long with the apex hexagonal, truncate, 7–11 mm wide by 2–7 mm high, pale to dark brown tomentose, and with sporangia distributed abaxially in two zones separated by a 2–4 mm sterile section.

Figure 5.—: Pollen cone and microsporophyll details from a *Zamia loddigesii* specimen originating from Coatzacoalcos in Veracruz, now growing at Montgomery Botanical Centre in Florida. Photo kindly supplied by Michael Calonje.

Zamia loddigesii bears 1–2 **ovulate cones** per stem, these are 7–16 cm long excluding the peduncle, 4–6 cm in diameter, erect, ellipsoidal to conical, beige or pale brown tomentulose, with a blunt to shortly apiculate acute apex, and with brown tomentose peduncle 4–6 cm long, 10–16 mm in diameter. **Megasporophylls** are about 10 mm long with the apex hexagonal, truncate, and 19–26 mm wide by 7–10 mm high. **Seeds** are ovoid, 14–18 mm long by 8–10 mm in diameter, the sarcotesta pink at first becoming orange to red when ripe, the sclerotesta somewhat 3-sided, smooth and pale brown.

Unlike the situation in some other zamias with extensive distributions (e.g. *Z. paucijuga* and *Z. polymorpha*), the chromosome number for *Z. loddigesii* seems constant, with diploid number 2n = 18. This may suggest

Figure 6.—: Ovulate cones on a *Zamia loddigesii* in habitat near El Suizo, Tabasco. Photo: Andrew Vovides.

Figure 7.—: A *Zamia loddigesii* with ovulate cone, in habitat near Monte Oscuro, Veracruz. Photo: Andrew Vovides.

Figure 8.—: Ovulate cones on a 10-year old multiheaded specimen, believed to be *Zamia loddigesii*, in cultivation in a garden in Hawaii. Photo: Greg Holzman.

that *Z. loddigesii* is of earlier origin than similar species that show chromosome variability.

Distinguishing features

Some *Zamia loddigesii* populations appear to be closely related to *Z. polymorpha*, being separated from the later species only in 1998. The ranges for these taxa do not overlap geographically. Morphologically, the main differences lie in the shape and color of the pollen and ovulate cones. Pollen cones of *Z. loddigesii* are light to medium brown at the time of dehiscence and have sporophylls with a large terminal facet obscuring the laterals. In contrast, pollen cones of *Z. polymorpha* are a dark reddish brown or maroon tomentose, and have sporophylls with a small terminal process surrounded by six prominent lateral facets. Ovulate cones of *Z. loddigesii* are cylindrical, pale to medium brown tomentose, usually with a prominent apical extension, while ovulate cones of *Z. polymorpha* are ovoid, maroon tomentose, and have a gradually acute apex.

Zamia loddigesii seems in many ways to be the Caribbean equivalent of *Z. paucijuna* from the Pacific seaboard. Although they are well-separated geographically, the two species are similar morphologically. *Z. paucijuga* is distinguished to some extent by its more coriaceous leaflets that have longer marginal teeth.

Figure 9.—: Seeds dehiscing from a *Zamia loddigesii* cone on a plant in cultivation at Montgomery Botanical Center, Florida. This specimen originated from the population near Chavarrillo in Veracruz. Photo kindly supplied by Michael Calonje.

Notwithstanding the views of Schutzman (see above), our concept of *Z. loddigesii* falls within the "Zamia loddigesii complex" which brings the southern Mexican taxa *Z. loddigesii*, *Z. paucijuga*, *Z. polymorpha* and *Z. spartea* together with *Z. prasina* from Belize (Nicolalde-Morejón et al. 2009).

Ethnobotany

Because of the widespead distribution of *Zamia loddigesii*, plants of this species concept are known under a wide variety of local names. In Chinantec, it is *ma-bu-*

Figure 10.—: *Zamia loddigesii* plants cultivated as a hedge-like ground-cover, in a garden in Hawaii. Photo: Greg Holzman.

ma-mo; in Mazatec, *ya-tuj-cho-chu*; in Nahuatl, *teocintle* (preferred to *teocinte* or *teosintle*, sacred ear of maize, the plant), *mazorca* (the cone); in Otomí, *cuachumpoyo*, *guachumpoyo* or *tzompollo*; or in Yucatec, *cahua* (sago), *chac hua* or *chacuhua* (mountain sago), *maíz de coshca* or *poua*. In Spanish, this cycad is referred to as *amigo del maíz* (friend of maize), *camotillo* (diminutive from the Nahuatl *camotl*, tuber), *palmiche* (palmetto), *palmilla*, *palmita* or *palmito* (little palm). Many of these names may also refer to related zamias occuring in the same gerenal distribution.

Zamia loddigesii is planted widely as an ornamental in the Gulf lowlands of Oaxaca around Tuxtepec. Mazatec schoolchildren in that region use the sarcotestae of ripe seeds as a source of red "ink"; this is the only known record of cycad material used as a natural dye (Mark Bonta, pers. comm.).

Conservation status

Although occurring over a large area in six different states, habitat reduction has occurred throughout the range to various degrees, and the species or species complex, now remains as a mosaic of fragmented populations, many of which are alarmingly small. In an investigation of the genetic diversity and population structure of *Zamia loddigesii*, Jorge González-Astorga and co-workers (2006) have found increased genetic drift and reduced gene flow to be affecting the integrity of the species. Only one population has protection within a reserve, that being the population in the Los Tuxtlas Biosphere Reserve in Veracruz. The total number of plants assigned to *Z. loddigesii* is estimated at more than 20,000 (Stevenson et al. 2003). The species is protected under Mexican Law NOM-059-ECOL and is listed as near threatened on the IUCN Red List of Threatened Species (2009).

Cultivation

Plants under the name *Zamia loddigesii* are common in cultivation globally. It is relatively easy to maintain in tropical and subtropical garden plantings, in glasshouse cultivation in more temperate zones, and is useful as an indoor container plant. Greg Holzman calls this cycad "bullet proof" and adds that it holds up well in the dry season. Older, multi-headed specimen plants are attractive features in a garden setting. Its requirements are much as for other zamias: a well-drained good quality soil, sufficient watering and fertiliser application at the start of the growing season. Cultivated plants cone annually and human-assisted pollination can ensure a good seed set from which plants are easily raised.

Acknowledgments

We thank Mark Bonta, Michael Calonje, Greg Holzman, Anders Lindström, Felix Merklinger, Lou Randall, Bart Schutzman and Dennis Stevenson for assistance in the preparation of this article.

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A few observations on different forms of *Encephalartos middelburgensis*

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After I received a call from Dr. Diekie de Klerk concerning the difference in color on the male cones of *Encephalartos middelburgensis*, I went into my garden to investigate. I then looked at the three different forms and on closer investigation found numerous differences.

To simplify the habitat of the three forms they are named as follows:

1. ***E. middelburgensis*** **Olifants River.** This form is in the upper catchment area of the Olifants river near Middelburg

2. ***E. middelbergensis*** **Wilge River.** This form is found on the Olifants river after the Wilge river joins it nearer to the Loskop Dam

3. ***E. middelburgensis*** **Avontuur.** This form was found on the Avontuur road, on the farm Nooitgedacht 345. Unfortunately this form is extinct in nature. According to an old farmhand that has been on the farm all his life, the last large male specimen started leaning over until it toppled over and then died after numerous veldt fires went over it. According to him there was only the one large male plant. Many suckers were harvested from this plant in the 1960's and 70's. This form suckers profusely, therefore there are many plants in private gardens.

4. There is a rumour that an *E. middelburgensis* form was found on Bothasberg, so far no one could verify this find. It is said that the leaflets of this form has prickles on the upper and lower margins. Plants with this similarity were found among other normal plants in the Wibank and Pienaars river area.

Male Cones

1. ***E. middelburgensis*** **Olifants River.** These cones are a little smaller than the Wilge river form The color is dark brown

2. ***E. middelbergensis*** **Wilge River.** These cones are the largest of the three forms. The color is a light dirty green.

3. ***E. middelburgensis*** **Avontuur.** These cones are the smallest of the three forms. The color is a light brownish green. Only male plants exist.

Leaves

1. ***E. middelburgensis*** **Olifants River.** The leaves as a whole form a neat setup with the apex of the leaves slightly turned up. The base of the rachis has no spines, the last few leaflets are only smaller, and then there is quite a large portion of the rachis that is bare.

2. ***E. middelbergensis*** **Wilge River.** This is the most robust form of the three, the leave are the longest, and tend to twist in the older plants. The plant as a whole gives the impression of straight leaves. This form has a few leaflet spines but leaves a small portion of the rachis bare. Sometimes one will find a female plant with the spines going right down to the base; these plants are mistaken to be female Avontuur forms. But the plant as a whole tends to be robust and looks like the Wilge form in appearance.

3. ***E. middelburgensis*** **Avontuur.** This form has the straightest and shortest leave of the three forms. This form has leaflet spines right up to the base of the rachis.

Leaflets

1. ***E. middelburgensis*** **Olifants River.** The leaflets are very narrow compared to the other two forms. The pp-angle of leaflets is almost closed. If you hold your thumb and forefinger 10 mm apart you get the idea. The leaflets do not join the rachis directly opposite each other.

2. ***E. middelbergensis*** **Wilge River.** In comparison with the other two forms the leaflets on this form is very long and broad. The pp-angel is much more open

than the Olifants river form. The leaflets join the rachis directly opposite each other

3. ***E. middelburgensis* Avontuur.** In comparison with the other two forms the size of the leaflets on this form is in between the other two. The pp-angel is almost completely open. The leaflets join the rachis directly opposite each other as in the Wilge river form.

These three forms should be kept apart when pollination takes place, just as in the *E. natalensis* and *E. leavifolius* groups. If not we will end up with a lot of mongrels in our gardens when these three species are separated one day. A Nature Conservation official told me that they are in the process of pollinating E. middelburgensis in the Middelburg area and the idea is to start a Provincial nursery. Let us hope this works, it should help to put an end to the unauthorized removal of plants out of nature.

The cones in the accompanying photographs are not fully mature yet and will grow significantly longer until pollen is shed. The material can be identified as follows: O = Olifantsrivier form, W = Wilgerivier form, A = Avontuur form.

Fiji's most hidden secret.

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On a recent two months visit to 35 Fiji islands, some inhabited some not, I was surprised to find virtual forests of *Cycas seemannii* or Queen Sago-palm on three remote islands. On the three main islands namely Vitu Levu, Vanua Levu and Taveuni with it's deforestations these Cycads are critically endangered. Even on Taveuni with it's virgin forest on Des Vaux (Devils Peak) I have not seen any significant Cycads. What I have seen though full in bloom is the famous flower the Tagimaucia or Medinilla waterhousei that grows in the high altitudes of Des Vaux and nowhere else on Fiji or the world. To date it has not been successfully transplanted and does not grow anywhere else in Fiji. See last picture right, page 25.

As early as 1860 *C. seemannii* from Fiji was described by German professor of botany Alexander Carl Heinrich Braun from specimens collected by Seemann in Fiji.

The Natural habitat is described as on coral sands and limestone formations yet the habitat on the remote islands North of Vanua Levu is pure soil of volcanic origin. Three of these islands are densely forested by the Cycads. Unfortunately one of the islands is inhabited by goats and eroded because of the overgrazing and this has and impact on the population. The islands without goats are more densely populated. I have spend some time with the Chief and his son William to implore them to get rid of the

goats because in cyclones the top soil will be removed. They had no knowledge of the Cycad plant and it seem that I was the first to mention the uniqueness of Cycads. It can be a great tourist attraction although tourism and resorts are not allowed on those islands. Of interest is also pottery pieces on the mountain.

The *C. seemannii* is also found on other Pacific islands. It is one of the most sacred plants of the Republic of Vanuatu where its starchy pith provides flour, and images carved of its trunk delimit sacred areas and are symbols at funerals. It is on the Vanuatu coat-of-arms. In Fiji the fruits were formerly reserved for chiefs.

This certainly had it's impact on me although I do not have Cycads and live in Yzerfontein. Anyone is welcome to contact me.

DNA Barcoding all Africa's Cycads

Philip Rousseau *

Most botanists would agree that the identification of species is one of the most challenging arts in science, especially in complex groups such as cycads. In cycads a marked similarity is found between species while between individuals of the same species a large amount of variation exist. It is the role of a plant taxonomist to study and order this diversity and he/she does so by employing various "lines of evidence" to draw conclusions. One of the most recent and currently most used is molecular evidence. One very promising and exiting new tool for taxonomic research is DNA barcoding. It is relatively simple to apply and yet can distinguish even between closely related species. It works by comparing the sequence of DNA bases from a short part of the genome that is standardised between taxa. For land plants, a combination of two plastid gene regions (*rbcL* and *matK*) is used as barcodes. In the long-term barcoding scientists envisage something called a "barcoder". It will be a hand-held device that would only need a small piece of the plant tissue. It will read the barcodes on the spot and tell you its identity. Though we are far from this stage, cycad samples can already be identified off-site within 48 hours at the Molecular Systematics Laboratory at the University of Johannesburg.

The implication and importance of the above-mentioned to cycad conservation cannot be overstated. As there is great difficulty in determine species (especially with juveniles) and even deciding what constitutes a species, DNA barcoding would provide some resolution towards this. More importantly the identification of otherwise indistinguishable plants or fragments would be possible by non-taxonomists, the application of which ranges from correct pollination to law enforcement.

Based on these consideration, and a chance to work on these wonderful plants, a masters level project has been launched at the University of Johannesburg of which I will be the main researcher under the supervision of one of the leading South African scientist in the field, Prof. Michelle van der Bank. I will build a DNA barcoding library for all *Encephalartos* species and *Stangeria eriopus* sampling as many individuals as possible aiming at approximately 5-10 samples per species encompassing as much of the natural diversity as possible. The barcode of an unidentified specimen can then be compared with the reference barcodes to find the matching species. Another aim of my study is to reconstruct a molecular phylogeny for African cycads from which the major lineages (clades) and relationships will be assessed. These will then be compared to the current taxonomy in order to provide a better understanding of the taxonomy and evolutionary relationships within the group.

The Project thus far has progress extremely well, due in no small way, to the support of the Cycad Society and its members to which I am very grateful. The first round of sampling has been completed and analysis of these samples is under way. Preliminary results will be presented at the TreeBOL symposium in New York in April while the project aims to be concluded end of 2010. It is my sincere hope that this will provide a great service to the Cycad Society and its members along with government (custom officials) and the scientific community.

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Cycads of the world for the layman

Leon Pienaar* and Pieter Janse van Rensburg

Bowenia

1.	*B. serrulata*	Queensland, Australia
2.	*B. spectabilis*	Queensland, Australia

Ceratozamia

1.	*C. alvarezii*	Chiapas, Mexico
2.	*C. becerrae*	Tobasco & Chiapas, Mexico
3.	*C. chimalapensis*	Mexico
4.	*C. decumbens*	Veracruz, Mexico
5.	*C. euryphyllidia*	Oaxaca & Veracruz, Mexico
6.	*C. fuscoviridis*	Mexico
7.	*C. hildae*	San Luis Potosi & Queretaro, Mexico
8.	*C. huastecorum*	Veracruz , Mexico
9.	*C. hondurensis*	Honduras
10.	*C. kuesteriana*	Tamaulipas, Mexico
11.	*C. latifolia*	San Luis Potosi ,Queretaro & Hildalgo, Mexico
12.	*C. matudae*	Chiapas, Mexico
13.	*C. mexicana*	Hildalgo, Puebla, San Luis Potosi & Veracruz, Mexico
14.	*C. microstrobila*	San Luis Potosi , Mexico
15.	*C. miqueliana*	Chiapas & Veracruz, Mexico
16.	*C. mirandae*	Chiapas & Oaxaca, Mexico
17.	*C. mixeorum*	Oaxaca, Mexico
18.	*C. morettii*	Veracruz, Mexico
19.	*C. norstogii*	Chiapas, Mexico
20.	*C. robusta*	Oaxaca & Veracruz, Mexico; Belize & Guatemala
21.	*C. sabatoi*	Queretaro & Hildalgo, Mexico
22.	*C. santillanii*	Mexico
23.	*C. vovidesii*	Mexico
24.	*C. whitelockiana*	Oaxaca, Mexico
25.	*C. zaragozae*	San Luis Potosi, Mexico
26.	*C. zoquorum*	Chiapas, Mexico

Cycas

1.	*C. aculeate*	Vietnam
2.	*C. aenigma*	Philippines
3.	*C. annaikalensis*	India
4.	*C. angulata*	Northern Territory, Australia
5.	*C. apoa*	New Guinea ; Indonesia
6.	*C. arenicola*	Northern Territory, Australia
7.	*C. armstrongii*	Northern Territory, Australia
8.	*C. arnhemica* subsp. *arnhemica*	Northern Territory, Australia
9.	*C. arnhemica* subsp. *muninga*	Northern Territory, Australia
10.	*C. arnhemica* subsp. *natja*	Northern Territory, Australia
11.	*C. badensis*	Queensland , Australia
12.	*C. balansae*	Vietnam; China
13.	*C. basaltica*	Western Australia
14.	*C. beddomei*	India
15.	*C. bifida*	Vietnam; China
16.	*C. bougainvilleana*	New Britian; Solomon Islands
17.	*C. brachycantha*	China; Laos; Thailand & Vietnam
18.	*C. brunnea*	Northern Territory & Queensland, Australia
19.	*C. cainsiana*	Queensland, Australia
20.	*C. calcicola*	Northern Territory , Australia
21.	*C. campestris*	Papua New Guinea
22.	*C. candida*	Australia
23.	*C. canalis* subsp. *canalis*	Northern Territory , Australia
24.	*C. canalis* subsp. *carinata*	Northern Territory , Australia
25.	*C. camaoensis*	Thailand
26.	*C. changjiangensis*	China & Vietnam
27.	*C. chevalieri*	Vietnam
28.	*C. circinalis*	South India
29.	*C. clivicola* subsp. *clivicola*	Thailand
30.	*C. clivicola* subsp. *lutea*	Thailand
31.	*C. collina*	Vietnam
32.	*C. condaoensis*	Con Dao Islands
33.	*C. conferta*	Northern Territory , Australia
34.	*C. couttsiana*	Queensland, Australia
35.	*C. cupida*	Queensland, Australia
36.	*C. curranii*	Philippines
37.	*C. debaoensis*	China
38.	*C. desolata*	Queensland, Australia
39.	*C. diannanensis*	China
40.	*C. dolichophylla*	China & Vietnam
41.	*C. edentata*	Philippines
42.	*C. elephantipes*	Thailand
43.	*C. elongata*	Vietnam
44.	*C. falcata*	Sulawesi & Kabaena Island, Indonesia
45.	*C. ferriginea*	China
46.	*C. fugax*	Vietnam
47.	*C. furfuracea*	Western Australia
48.	*C. glauca*	Indonesia (Timor & Sumba islands)
49.	*C. guizhouensis*	China

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50. *C. hainanensis* Hainan Island, China
51. *C. hoabinhensis* Vietnam
52. *C. hongheensis* China
53. *C. indica* India
54. *C. inermis* Vietnam
55. *C. javana* Java; Indonesia
56. *C. lacrimans* Philippines
57. *C. lane-poolei* Western Australia
58. *C. linstromii* Vietnam
59. *C. maconochiei* subsp. *maconochiei* Northern Territory , Australia
60. *C. maconochiei* subsp. *lanata* Northern Territory , Australia
61. *C. maconochiei* subsp. *viridis* Northern Territory , Australia
62. *C. macrocarpa* Malaysia; Thailand
63. *C. media* subsp. *media* Queensland, Australia
64. *C. media* subsp. *banksii* Queensland, Australia
65. *C. media* subsp. *ensata* Queensland, Australia
66. *C. megacarpa* Queensland, Australia
67. *C. micholitzii* Vietnam
68. *C. micronesia* Mariana Island; Guam
69. *C. montana* Indonesia
70. *C. multipinnata* China
71. *C. nathorstii* Sri Lanka
72. *C. nitida* Philippines
73. *C. nongnoochiae* Thailand
74. *C. ophiolitica* Queensland, Australia
75. *C. orientis* Northern Territory , Australia
76. *C. pachypoda* Vietnam
77. *C. panzhihuaensis* China
78. *C. papuana* Papua New Guinea
79. *C. parvulus* China
80. *C. pectinata* S.E. Asia; N.E. India; China
81. *C. petraea* Thailand
82. *C. platyphylla* Queensland, Australia
83. *C. pranburiensis* Thailand
84. *C. pruinosa* Northern Territory & Western Australia
85. *C. revolute* China & Japan
86. *C. riuminiana* Philippines
87. *C. rumphii* S.E. Asia & Pacific Ilands
88. *C. saxatilis* Philippines
89. *C. scratchleyana* New Guinea
90. *C. schumanniana* Papua New Guinea
91. *C. seemannii* Fiji; Tonga; Vanuata & New Caledonia
92. *C. segmentifida* China
93. *C. semota* Australia
94. *C. sexseminifera* China & Northern Vietnam
95. *C. shanyaensis* Hainan Island, China
96. *C. siamensis* S.E. Asia
97. *C. silvestris* Queensland, Australia
98. *C. simplicipinna* S.E. Asia
99. *C. spherica* North-easthern India
100. *C. sundaica* Indonesia
101. *C. swamyi* India
102. *C. szechuanensis* China
103. *C. szechuanensis* subsp. *fairylakea* China
104. *C. taitungensis* Taiwan
105. *C. taiwaniana* China
106. *C. tanqingii* China
107. *C. tansachana* Thailand
108. *C. thoursii* Africa & Madagascar
109. *C. tropophylla* Vietnam
110. *C. truncate* Palau, Philippines,Sumatra & Vietnam
111. *C. tuckeri* Queensland, Australia
112. *C. vespertilio* Philippines
113. *C. wadei* Philippines
114. *C. xipholepis* Queensland, Australia
115. *C. yorkiana* Queensland, Australia
116. *C. zambalensis* Philippines
117. *C. zeylanica* Sri Lanka; Andaman Islands & Nicobar

Dioon

1. *D. angustifolium* Nuevo Leon & Tamaulipas, Mexico
2. *D. argenteum* Northern Oaxaca Mexico
3. *D. califanoi* Oaxaca, Mexico
4. *D. capitoi* Puebla, Mexico
5. *D. edule* Mexico
6. *D. holmgrenii* Oaxaca, Mexico
7. *D. mejiae* Honduras
8. *D. merolae* Chiapas, Mexico
9. *D. oaxacaensis* Mexico
10. *D. purpusii* Oaxaca, Mexico
11. *D. rzedowskii* Oaxaca, Mexico
12. *D. stevensonii* Mexico
13. *D. sonorense* N. W. Coast, Mexico
14. *D. spinulosum* Vera Cruz & Oaxaca, Mexico
15. *D. tomasellii* S. W. Coast, Mexico

Encephalartos

1. *E. aemulans* KwaZulu-Natal, South Africa
2. *E. altensteinii* Eastern Cape, South Africa
3. *E. aplanatus* Swaziland
4. *E. arenarius* Eastern Cape, South Africa
5. *E. bateri* subsp. *bateri* Benin; Ghana; Nigeria; Sudan & Togo
6. *E. bateri* subsp. *allochrous* Nigeria
7. *E. brevifoliolatus* Limpopo, South Africa
8. *E. bubalinus* Kenya & Tanzania
9. *E. caffer* E. Cape, South Africa
10. *E. cerinus* KwaZulu-Natal, South Africa
11. *E. chimanimaniensis* Mozambique & Zimbabwe

12.	*E. concinnus*	Zimbabwe
13.	*E. cupidus*	Limpopo, South Africa
14.	*E. cycadifolius*	E. Cape, South Africa
15.	*E. delucanus*	Tanzania
16.	*E. dolomiticus*	Limpopo, South Africa
17.	*E. dyerianus*	Limpopo, South Africa
18.	*E. equatorialis*	Uganda
19.	*E. eugene-maraisii*	Limpopo, South Africa
20.	*E. ferox*	KwaZulu-Natal, South Africa & Mozambique
21.	*E. friderici-guilielmi*	E. Cape, South Africa
22.	*E. flavostrobilus*	Zambia
23.	*E. ghellinckii*	KwaZulu-Natal, South Africa
24.	*E. gratus*	Malawi & Mozambique
25.	*E. heenanii*	Mpumalanga, South Africa & Swaziland
26.	*E. hildebrandtii*	Kenya & Tanzania
27.	*E. hirsutus*	Limpopo, South Africa
28.	*E. horridus*	E. Cape, South Africa
29.	*E. humilis*	Mpumalanga, South Africa
30.	*E. inopinus*	Limpopo, South Africa
31.	*E. ituriensis*	Dem. Rep. Congo
32.	*E. kisambo*	Kenya
33.	*E. laevifolius*	Mpumalanga, South Africa & Swaziland
34.	*E. lanatus*	Mpumalanga, South Africa
35.	*E. latifrons*	E. Cape, South Africa
36.	*E. laurentianus*	Angola & Dem. Rep. Congo
37.	*E. lebomboensis*	KwaZulu-Natal & Mpumalanga, South Africa; Swaziland & Mozambique
38.	*E. lehmannii*	E. Cape, South Africa
39.	*E. longifolius*	E. Cape, South Africa
40.	*E. mackenziei*	South east Sudan
41.	*E. macrostrobilus*	Uganda
42.	*E. manikensis*	Mozambique & Zimbabwe
43.	*E. marunguensis*	Dem. Rep. Congo & Tanzania
44.	*E. middelburgensis*	Mpumalanga, South Africa
45.	*E. msinganus*	KwaZulu-Natal, South Africa
46.	*E. munchii*	Mozambique
47.	*E. natalensis*	KwaZulu-Natal, South Africa
48.	*E. ngoyanus*	KwaZulu-Natal & Mpumalanga, South Africa & Swaziland
49.	*E. nubimontanus*	Limpopo, South Africa
50.	*E. paucidentatus*	Mpumalanga, South Africa & Swaziland
51.	*E. poggei*	Angola & Dem. Rep. Congo
52.	*E. powysii*	Kenya
53.	*E. princeps*	E. Cape, South Africa
54.	*E. pterogonus*	Mozambique
55.	*E. relictus*	Zwaziland
56.	*E. schaijesii*	Dem. Rep. Congo
57.	*E. schmitzii*	Dem. Rep. Congo & Zambia
58.	*E. sclavoi*	Tanzania
59.	*E. senticosus*	KwaZulu-Natal & Mpumalanga, South Africa
60.	*E. septentrionalis*	Sudan
61.	*E. umbeluziensis*	Swaziland & Mozambique
62.	*E. tegulaneus*	Kenya
63.	*E. transvenosus*	Limpopo, South Africa
64.	*E. trispinosus*	E. Cape, South Africa
65.	*E. turneri*	Mozambique
66.	*E. villosus*	E. Cape, KwaZulu-Natal & Mpumalanga, South Africa
67.	*E. whitelockii*	Western Uganda
68.	*E. woodii*	KwaZulu-Natal, South Africa

Lepidozamia

1.	*L. hopei*	Queensland, Australia
2.	*L. peroffskyana*	N.S.W. & Queensland Australia

Macrozamia

1.	*M. cardiacensis*	Queensland, Australia
2.	*M. communis*	N.S.W. , Australia
3.	*M. concinna*	N.S.W. , Australia
4.	*M. conferta*	Queensland, Australia
5.	*M. cranei*	Queensland, Australia
6.	*M. crassifolia*	Queensland, Australia
7.	*M. diplomera*	N.S.W. , Australia
8.	*M. douglasii*	Queensland, Australia
9.	*M. dyeri*	Western Australia
10.	*M. elegans*	N.S.W. , Australia
11.	*M. fawcettii*	N.S.W. , Australia
12.	*M. fearnsidei*	Queensland, Australia
13.	*M. flexuosa*	N.S.W. , Australia
14.	*M. fraseri*	Western Australia
15.	*M. glaucophylla*	N.S.W. , Australia
16.	*M. heteromera*	N.S.W. , Australia
17.	*M. humilis*	N.S.W. , Australia
18.	*M. johnsonii*	N.S.W. , Australia
19.	*M. lomandroides*	Queensland, Australia
20.	*M. longispina*	Queensland, Australia
21.	*M. lucida*	Queensland, Australia
22.	*M. macdonnelii*	Northern Territory, Australia
23.	*M. machinii*	N.S.W. , Australia
24.	*M. macleayi*	Queensland, Australia
25.	*M. miquelii*	N.S.W. & Queensland Australia
26.	*M. montana*	N.S.W. , Australia
27.	*M. moorei*	Queensland, Australia
28.	*M. mountperriensis*	Queensland, Australia
29.	*M. occidua*	Queensland, Australia
30.	*M. parcifolia*	Queensland, Australia
31.	*M. pauli-guilielmi*	Queensland, Australia
32.	*M. platyrachis*	Queensland, Australia
33.	*M. plurinervia*	N.S.W. & Queensland Australia
34.	*M. polymorpha*	N.S.W. , Australia
35.	*M. reducta*	N.S.W. , Australia
36.	*M. riedlei*	Western Australia

37.	*M. secunda*	N.S.W. , Australia
38.	*M. serpentina*	Queensland, Australia
39.	*M. spiralis*	N.S.W. , Australia
40.	*M. stenomera*	N.S.W. , Australia
41.	*M. viridis*	Queensland, Australia

Microcycas

1.	*M. calocoma*	Western Cuba

Stangeria

1.	*S. eriopus*	Eastern Cape & Kwazulu Natal , South Africa

Zamia

1.	*Z. acuminata*	Nicaragua & Panama
2.	*Z. amazonum*	Brazil, Colombia , Peru & Venezuela
3.	*Z. amblyphyllidia*	Cuba, Jamaica & Puerto Rico
4.	*Z. amplifolia*	Colombia
5.	*Z. angustifolia*	Bahamas & Cuba
6.	*Z. boliviana*	Bolivia
7.	*Z. bussellii*	Honduras
8.	*Z. chiqua*	Colombia & Panama
9.	*Z. cremnophila*	Mexico
10.	*Z. cunaria*	Panama
11.	*Z. decumbens*	Belize
12.	*Z. disodon*	Northern Colombia
13.	*Z. dressleri*	Panama
14.	*Z. elegantissima*	Panama
15.	*Z. encephalartoides*	Colombia
16.	*Z. fairchildiana*	Costa Rica & Panama
17.	*Z. fischeri*	Mexico
18.	*Z. floridana*	Florida , U.S.A.
19.	*Z. furfuracea*	Mexico
20.	*Z. gentryi*	Ecuador
21.	*Z. hammanii*	Ecuador
22.	*Z. herrerae*	Guatemala & Mexico
23.	*Z. hymenophyllidia*	South eastern Amazonia , Colombia
24.	*Z. imperialis*	Panama
25.	*Z. inermis*	Mexico
26.	Z. integrifolia	Florida & Georgia U.S.A. , Bahamas , Cuba & Caiman Islands
27.	*Z. ipetiensis*	Panama
28.	*Z. katzeriana*	Mexico
29.	*Z. lacandona*	Eastern Chiapas Mexico
30.	*Z. lecointei*	Brazil
31.	*Z. lindenii*	
32.	*Z. lindleyi*	Panama
33.	*Z. loddigesii*	Mexico
34.	*Z. lucayana*	Bahamas
35.	*Z. manicata*	Northern Colombia & Southern Panama
36.	*Z. meermanii*	Belize
37.	*Z. melanorrhachis*	North central Colombia to Amazonian Colombia
38.	*Z. montana*	Colombia & Venezuela
39.	*Z. monticola*	Guatemala
40.	*Z. onanreyesii*	Honduras
41.	*Z. muricata*	Venezuela
42.	*Z. nesophilla*	Panama
43.	*Z. neurophyllidia*	Panama
44.	*Z. oblique*	Colombia & Southern Panama
45.	*Z. oreilliy*	Honduras
46.	*Z. paucijuga*	Western Mexico
47.	*Z. poeppigiana*	Ecuador & Peru
48.	*Z. polymorpha*	Belize & Mexico
49.	*Z. portoricensis*	Puerto Rico
50.	*Z. pseudomonticola*	Costa Rico
51.	*Z. pseudoparasitica*	Costa Rica & Panama
52.	*Z. prasina*	Soutern Belize
53.	*Z. pumila*	Cuba , Dominican Rep. & Florida U.S.A.
54.	*Z. purpurea*	Mexico
55.	*Z. pygmaea*	Cuba
56.	*Z. roezlii*	Colombia
57.	*Z. restrepoi*	Colombia
58.	*Z. sandovalii*	Honduras
59.	*Z. skinneri*	Panama
60.	*Z. soconusensis*	Mexico
61.	*Z. spartea*	Mexico
62.	*Z. splendens*	Mexico
63.	*Z. standleyi*	Honduras
64.	*Z. stricta*	Cuba
65.	*Z. tuerckheimii*	Guatemala
66.	*Z. ulei*	Brazil
67.	*Z. urep*	Peru
68.	*Z. variegata*	Belize , Guatemala & Mexico
69.	*Z. vazquesii*	Mexico
70.	*Z. wallisii*	Colombia

Notes

1. Lindström (et al) provide evidence that the genus *Chiqua* is in synomy with the genus *Zamia*, there is also evidence that *Chiqua bernalii* and *Chiqua restrepoi* is the same spesie.

2. *Cycas chamberlainii* is included in synonymy of *C. riuminiana* (Telopea 12(1) 132)

3. *Cycas litoralis* is included in synonymy of *C. edentate* (Telopea 12 (1) 140)

4. Lindström provide evidence for *Z. lindenii* to be a distinct species and it is no longer consider as synonymous with *Z. poepigiana*.

5. *Zamia oligodonta* is a synonym of *Z. montana* (Lindström 2009)

House fumigation and cycads

William Tang*

Figure 1.—: House tented in preparation for dry wood termite fumigation; note cycad plants next to tent edges.

Introduction

Fumigating your house for termite infestations is often necessary. In some places, like South Florida, this must be done regularly to prevent damage from dry wood termites. The fumigation process requires that your house be "tented" - covered over with tarps to create a fairly airtight enclosure so that a poisonous gas can be introduced inside. A problem arises if your cycads are located too close to the house, since the fumigants used in house fumigations can be lethal to plants. If you are like me and have a small property, you may try to fit as many plants as you can in the limited space available and plant many of your cycads closer to the house than is advisable. If you fumigate your house, how can you avoid damage or death to these cycads as a result of exposure to toxic fumigants?

I faced this problem recently. The solution I came up with was based on a study of (1) the poison gas used and (2) the tarping system employed to enclose the house for termite fumigation. The current fumigant of choice for dry wood termite fumigations in the United States is sulfuryl floride, SO_2F_2. This is likely the chemical of choice in many other parts of the world as well. Sulfuryl floride used in house fumigations is usually marketed under the trade names Vikane or Zythor. This gas is colorless and odorless and has low solubility in water. To prepare a house for fumigation, it is covered by plastic tarps (Figure 1). To produce a tight seal between the tarp and the ground, gravel, mulch or other loose debris should be cleared away from the spots where the tarps will lay against the ground (Figure 2). To prevent leaks and keep the gas inside the enclosure for the duration of the fumigation, the edges of the tarps are held down against the ground with heavy tubes of sand called "sand snakes" (see Figure 3). To further minimize leakage along the edge of the tarp, moist sand may be heaped on the edges, especially where the ground may not be smooth and flat or where there may be folds in the tarps, such as along corners.

Preparations

As a part of my job as an agricultural inspector I have worked with several fumigation companies and was told by experienced professionals that because of the low abil-

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Figure 2.—: To allow the tarp to form a tight seal with the ground gravel, mulch or loose debris need to swept away; note the sand snakes in the foreground that will be used to hold down the tarp edges.

Figure 3.—: Sand snakes, tubes filled with sand, are used to secure the edge of tarps; moist sand piled along the edges also helps prevent leakage of fumigants; duct tape may also be also employed.

ity of sulfuryl floride to penetrate water you could leave an aquarium with fish inside your house while it is being fumigated and the fish will be unharmed! Using this fact I designed and tested a protective barrier between the plant and the gas. For plants that would be unavoidably covered by the edges of the tarps I cut off all leaves and then I buried the stem under a mound of dense muddy soil (Figure 4). My material of choice was everglades muck, a thick organic mud dredged up from the nearby swampy Everglades and sold locally as an organic soil amendment. Other materials, however, may be suitable, depending on what is locally available in your area. Just prior to fumigation day I sprayed water on the mud and soil all along the side of the house to the point of saturation to increase the soil's impermeability to the fumigant. Also I chose to conduct the fumigation in the winter time when the plants were not flushing leaves and when presumably their meristems were least active. A previous study of flood damage to cycads indicated that plants with active meristems are highly vulnerable to stresses such as immersion in water, whereas cycads with inactive meristems were more resistant to these kinds of stress (Tang 2003). Generally fumigation companies will warn you that any plant within 2 feet (60 cm) of the edge of tarps may be damaged during a fumigation. The reasoning behind this is if there are any leaks along the edge of the tarp, such plants may be exposed to the fumigant, even though they are not enclosed within the tarp. To prevent this kind of potential damage you should ensure that there are plenty of sand snakes placed on the tarp edges near where cycads are planted and extra moist sand should be heaped on the edges to further prevent leakage.

Results

Fumigation treatments for dry wood termites generally require that fumigants need to be pumped into a tented house and remain inside for about 24 hours. At the end of the period the tarps are removed and the fumigant is released. Once the fumigation was completed at my house I dug away the piles of muddy soil from the cycads that have been enclosed or partly enclosed under the tarp. Months may pass before you know whether the stem has survived and begins flushing new leaves or whether it is clear that the stem has died and its growing tip is rotting. In my case almost all plants recovered and flushed new leaves after 3 months (see Table 1). Only a single plant of *Zamia standleyi* took longer than this to produce new leaves – this specimen has never been vigorous and this may have contributed to its slower recovery. One plant did not survive – a seedling of *Cycas micholitzii*. Two other plants of this species resprouted new leaves after the fumigation, but then later died at the end of the summer. Both of these plants had been

Table 1.—: A list of plants that were defoliated, buried with mud, covered by tarps and fumigated; recovery rates, as indicated by the number of plants with new leaf flushes, are tallied at 1, 2 & 3 months.

Species - # plants	# plants flushing leaves after 1 month	# plants flushing leaves after 2 months	# plants flushing leaves after 3 months
Cycas micholitzii - 7	1	~3	6
Zamia amblyphyllidia (Jamaica) -1*		1	1
Z. pumila (Dom. Rep.) – 3*	2		3
Z. standleyi – 3*			2
Z. vasquezii – 2*		2	

* - all plants eventually flush leaves

Figure 4.—: (A) A *Zamia pumila* (Dominican Republic) before burial (note bag of muck to the left); (B) the same plant defoliated and covered by a pile of muck.

suffering a chronic infestation of cycas aulacaspis scale (see Tang 1997, 2006) for several years and had been declining. Their demise may have been the result of the scale infestation, the defoliation or exposure to the fumigant, however, it is likely that all these factors contributed to their deaths. One of the branches of a multi-headed *Zamia pumila* (Dominican Republic) also succumbed to the fumigation, however, the other branches on this plant survived and flushed vigorous heads of leaves afterward and appeared relatively undamaged by the process.

Many of my cycads were neither buried nor partly covered over with tarps, but were within two feet (60

Figure 5.—: Plants on the very edges of tarps, such as these may be exposed to leaking gas; the *Ceratozamia* on the right suffered leaf damage.

cm) of the edge of tarps (Figure 5). Some of these were right up against the edge of the tarp. Fortunately, most of these suffered no visible damage and flushed new leaves or cones in the next growing season (see Table 2). For three of these plants, however, it appeared that I did not properly ensure that adjacent tarps had been tightly sealed and were free from leakage of fumigant. One week after the fumigation one *Ceratozamia* sp. "redback" suffered some burning to its leaves (See Figure 6), but eventually recovered, and two *Zamia variegata* were defoliated – one of these died, but the other survived and recovered slowly. The browning of leaves suggests that roots had been damaged and that the plants were unable to draw up enough water from the soil. Often during fumigations wind will blow the tented structure and cause a billowing effect – this will force gas out through available cracks, especially on the leeward side of the tent, away from the

Table 2.—: Plants within two feet (60 cm) of fumigation tarp edges and the number that suffered damage or were killed.

Species – total # plants	# plants with no apparent damage	# plants with damage to leaves	# plants killed
Ceratozamia microstrobila - 2	2		
C. miquelii - 2	2		
C. robusta complex - 2	2		
C. sp. "redback" - 2	1	1	
C. sp. hybrid "redback" x *hildae* (?) - 1	1		
Encephalartos bubalinus - 1	1		
E. ferox - 1	1		
Lepidozamia peroffskana - 1	1		
Zamia katzeriana -1	1		
Z. nesophila -2	2		
Z. variegata - 5	3	1	1
Z. vasquezii - 4	4		

Figure 6.—: Young plant of *Ceratozamia* sp. "redback" shows browning of leaflet tips 2 weeks after fumigation suggesting that it has suffered root damage.

wind. This appeared to have been the case for the three damaged plants in my house fumigation.

Conclusion

Overall, I would suggest that you use foresight and plant your cycads at least 3 feet or more from your house. If you live in an area where you can grow cycads outdoors, it is quite likely that the climate is favorable for dry wood termite infestations. If this is the case, a fumigation is very likely to occur while you occupy your house and develop a cycad garden. Luckily, other than the laborious and damaging process of digging up your cycads prior to your house fumigation, the burial method described here seems highly effective, especially if the cycads involved have subterranean stems or have not yet formed a tall trunk. Working with your fumigator on securing leaks around the edge of the fumigation tarps is also highly recommended. This burial method, however, is not recommended for cycads with substantial above ground trunks.

About the author

The author is a licensed commercial pesticide applicator in the U.S. and has extensive experience supervising fumigations of plants and plant products under tarps.

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Using *Ceratozamia hildae* as a screen/hedge

William Tang*

Figure 1.—: A row of *Ceratozamia hildae* planted as a screen forms a backdrop for other specimen cycads, including *C. robusta* on the left, *C. kuesteriana* in the center foreground and *Dioon spinulosum* on the right.

Unlike most cycads, the leaves of *Ceratozamia hildae* are fairly upright. Its leaflets are also clustered so that the overall impression of its foliage is that of a clump of bamboo. Bamboos are often planted in rows to create a privacy screen – so I thought: why not try the same with *Ceratozamia hildae*? In subtropical south Florida *Ceratozamia hildae* grows quickly from seed and may begin coning at 5 years of age under good horticultural conditions. It is easy to hand pollinate and seeds can be produced relatively easily. (In southern California, where the climate is warm temperate and less humid, seed production is less reliable). It can be grown in a wide variety of soils and is fairly drought tolerant when established. It can tolerate deep shade to partial sun. All these factors make it suitable as a screen plant. Due to their location screen plants often receive less irrigation, may be neglected and are often exposed to a variety of conditions.

I planted my cycad hedge along 20 meters of cyclone fence that separates my property from my neighbor. In my nursery I grew two plants in each pot so as to create a full

Figure 2.—: The same row of *Ceratozamia hildae* in Fig. 1, but viewed from the neighbor's side. The plants are located next to a lawn and are exposed to full sun in the late afternoon.

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Figure 3.—: A view of the *Ceratozamia hildae* screen from the neighbor's side; the foliage is often clipped to resemble a hedge.

clump at planting time, however with age this species will naturally sucker and form a clump in cultivation. I planted 24 pots 0.6 meters apart. After two years of regular watering, my plants now receive very little irrigation besides natural rainfall. They serve as a backdrop in my cycad landscape (see Figure 1) and form a dense and very effective screen as viewed from my side of the yard as well as my neighbor's (see Figures 2 & 3). On my side of the yard it is shade to partial sun. I do not have control of the conditions on my neighbor's side and the plants get full sun for most of the afternoon. With age *Ceratozamia hildae* will produce leaves up to about 2.2 meters long, however, my neighbor treats these plants like any other shrub and trims the foliage to conform to a hedge (see Figure 3). My planting is full enough however, that it maintains its role as a screen despite this abuse.

Cycads are often viewed strictly as specimen plants, but my example shows they can also be planted for utilitarian purposes. Furthermore, my row of 24 clumps (consisting of over 40 individual plants) serves as a propagation colony and I am able to pollinate many cones each season and can produce hundreds of seeds a year. If you have a small property, like me, this is really one of the best ways to aesthetically incorporate a large colony of plants into your landscape design.

Encephalartos cupidus / E. nubimontanus identifikasie

Uitkenning van hierdie twee spesies skep probleme wanneer saailinge aangekoop word, omdat hulle baie eenders lyk. Dis soos die vraag: "Is 'n sebra wit met swart strepe, of swart met wit strepe" – 'n grys antwoord.

Almal van ons weet dat *E. cupidus* 'n ondergrondse stam het en dus kleiner is as *E. nubimontanus*. Verder, die keëls by volwasse plante help ook met differensiasie tussen die twee spesies.

Die probleem is egter wanneer saailinge aangekoop word – ek praat nou hier van plante ongeveer 8-10 jaar oud met 'n kaudeks deursnee van minder as 15 cm. Hulle lyk baie dieselfde.

E. cupidus se blare het meer stekels (basale pinnas verklein tot 'n reeks stekels). *Encephalartos nubimontanus* het meestal 'n skoon petiool, met slegs een of twee stekels, maar in geval van die "Robustus vorm" kan daar weer meer stekels voorkom.

Blaartjies (pinnas) wat kleiner of groter is, mekaar meer of minder oorvleuel (S-hoeke) afhangend van die spesie, word gebruik met identifikasie – alles relatiewe beskrywings, akademies korrek, maar prakties?

Is daar iemand van ons Vereniging wat meer inligting het , of dalk 'n artikel kan plaas ?

Ek heg 'n paar fotos aan van plante wat ek aangekoop het. Die identiteit van die plante is soos deur die kweker verskaf. Pas die punte hierbo bespreek toe en kyk of u saamstem met die identifikasie van die plante.

Figure 2.—: *E. cupidus* – no overlapping pinnae.

Figure 3.—: *E. cupidus* – relatively clean petiole.

Figure 1.—: *E. cupidus* – few prickles to leaf base.

Figure 4.—: *E. nubimontanus* – pinnae well spaced, no overlapping.

Encephalartos cupidus / E. nubimontanus identification

When buying seedlings of these two species, I find it difficult to tell the two species from each other. It's like the old question: "is a zebra white with black stripes, or black with white stripes" – a grey answer.

All of us know that *E. cupidus* has an underground stem and is therefore smaller than *E. nubimontanus*. Furthermore, the cones in adult plants can also help with identification.

The problem lies when buying seedlings of these two species – here I'm talking about plants 8-10 years old with a caudex diameter of less than 15 cm. These size plants look very much alike.

The leaves of *E. cupidus* have more basal pinnae tapering off into a series of prickles towards the caudex . With *E. nubimontanus* the petiole is relatively "clean" with only one or two prickles. However, this can be different with the "Robustus" form where there can be quite a number of prickles.

The leaves and pinnae can be smaller or bigger and overlap to a more or lesser extent (S- angles), depending on the species. All of these are relative points for identification and relative descriptions – academically correct but may not be practical to apply?

Is there anybody in our society that can help me with this problem, or perhaps place an article?

Attached are photos of plants that I bought. Apply abovementioned points and see if you agree with their identity.

André Beytell
Nelspruit.

Figure 5.—: *E. nubimontanus* – prickles down to leafbase.

Figure 6.—: *E. nubimontanus* – from a reputable nursery, slight overlapping of the pinnae.

Figure 7.—: *E. nubimontanus* – from a reputable nursery, bare petiole.

Figure 8.—: *E. nubimontanus* – no overlapping of the pinnae.

Figure 9.—: What is this? A robust form of *E. nubimontanus*?

Help asseblief,

Hierdie *Encephalartos friderici-guilielmi* het nou vir plus minus vyf jaar nie nuwe blare gestoot nie maar van jaar wel. Hulle het egter presies dieselfde problem as die vorige stel blare vyf jaar gelede. Die blare kom misvorm en verdroog voor asof dit een of ander siekte het.

Ek het die laaste tyd meer gereeld met Fungi-nil en Virikop swamdoder gespuit.

Ek verbeel my, dat hierdie behandeling baie gehelp het. Kan iemand help?

Hier is nog 'n storie

Die plant het nou die afgelope twee jaar dieselfde probleem.Die blaar se stam, aan die onderste derde van die blaar, lyk of dit gekneus/seer gekry het met die uitkom/geboorte slag.

Soos op die foto gesien kan word is daar ligte kolle, en dan word hulle bruin.

Kan iemand help?

Die plant is 'n *E. longifolius* ,maar het ook n bietjie *E. altensteinii* bloed in hom.

Groete .
Hans Viljoen
hhye@netactive.co.za

Beste Prof Nat,

Ek heg vir u 2 foto's aan van 'n *E. villosus* in my tuin wat so te sê reeds 'n volledige stel nuwe blare gemaak het en toe, uit dieselfde stam, begin het om 'n tweede stel blare te maak. Ek het alle literatuur wat tot my beskikking was opgelees, maar kon geen aanduiding vind dat dit normaal is nie.

Kan u dalk vir my die verskynsel verklaar?

Groete,
Hennie Roos
hroos@absamail.co.za

[Hennie Roos reports that his *E. villosus* made a new flush of leaves, just to repeat it when the first flush was almost fully grown. He asked Prof Nat Grobbelaar if that is unusual for the species.

Prof Grobbelaar confirmed he has not seen this before but that favourable growing conditions may be the reason for this enthusiastic growth.

Hennie then reported a THIRD flush of four leaves appearing after the second, bringing the total to 15 new leaves produced. Ed.]

Die redakteur,

Ek het hier 'n plant wat ek graag oor navraag wil doen en toelig met fotos. Ek hoop jy sal 'n plek kan vind in die volgende uitgawe van die Encephalartos.

Onderwerp: 'n Ferox wat anders is.

- Nuwe blare is bruin
- Pinnas baie breed en nie gekrul nie
- Blare is besonder lank - 2.2m
- Vroulik

Enigeen met 'n soortgelyke plant ?

Groete
Dion du Toit

[Dion du Toit reports a specimen of *Encephalartos ferox* that is somewhat different. New leaves emerge brown, pinnae are very wide and not revolute and the leaves are very long, 2.2 m. His plant is female.

Dion this form of *E. ferox* is not all that uncommon. It reportedly originates from the Kosi Bay area and further north into Mozambique. The figure below is of a male plant, growing in almost full sun and the leaves have the same characteristics as yours. Ed.]