

ENCEPHALARTOS

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SOUTH AFRICA

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COVER / VOORBLAD : *Dioon purpusii*, with an epiphyte covered trunk
fully 5 m tall

Photo: Piet Vorster

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FROM THE PRESIDENT

The Society is under new management, but it is not as bad as it sounds. In reality only the President is new, and his job is only to do what the Council and members tell him to do. Nevertheless there are a number of matters clamouring for attention, such as the seed- and pollen banks, the confusing and sometimes inapplicable local and international legislation, and increased participation by members in the activities and running of the Society.



A Society is what its members and management make of it. The Council of this Society has always consisted of very busy people who freely devoted of what little free time they have to the Society. I would like to pay homage to these people.

The first and most important person, who regrettably is not a member of our Society, is Cyril Manthe. In 1983 he brought out the first of three issues of the *Newsletter for the South African Palm & Cycad Collector*. At that time there was no formal Society, but the need for one was soon felt. Unfortunately this led to a bitter dispute: some people wanted a combined palm- and cycad society, while others (myself included) were of the opinion that there should be two separate societies because palms and cycads evolutionarily as well as in their horticultural requirements have nothing in common. This resulted in the establishment of the **Cycad Society of southern Africa** by Roy Osborne in 1984, with the first issue of *ENCEPHALARTOS* appearing in March 1985. Roy was an exemplary administrator, and this together with his irrepressible enthusiasm for all aspects of cycads, placed the Society on a very sturdy footing. In 1989 Roy relinquished the leader's position, and was succeeded by Nat Grobbelaar. Nat was a scientist before his retirement, and it showed by the attention to correctness of facts in his management. In turn he was succeeded in 1994 by Hannes Robbertse, one of those great lovers of our indigenous plants who has always had green fingers. Since 1998 Frederick de Jager ensured that all the Society's activities ran smoothly, and as during Hannes Robbertse's term of office, Frederick's was the most peaceful in the existence of the Society.

Piet Vorster

VAN DIE PRESIDENT

Die Vereniging is onder nuwe bestuur, maar dit is nie so erg as wat dit klink nie. Eintlik is dit net die President wat nuut is, en sy werk is bloot om te doen wat die Raad en die lede vir hom sê om te doen. Nogtans is daar 'n aantal sake waaraan ons aandag sal moet gee ten einde die Vereniging meer doeltreffend te maak, soos bv. die saad- en stuifmeelbanke, die verwarrende en soms ontoepaslike plaaslike en internasionale wetgewing, en groter deelname van lede in die werksaamhede en bestuur van die Vereniging.

'n Vereniging is wat sy lede en bestuur daarvan maak. Die Raad van hierdie Vereniging het nog altyd bestaan uit baie besige mense wat van hulle min vrye tyd vrylik aan die Vereniging gewy het. Graag wil ek hulde bring aan hierdie mense.

Die eerste en belangrikste persoon, wat jammer genoeg nie lid van ons Vereniging is nie, is Cyril Manthe. In 1983 het hy die eerste van drie uitgawes van die *Newsletter for the South African Palm & Cycad Collector* uitgebring. Op daardie tydstip was daar geen formele vereniging nie, maar die behoefte daartoe is spoedig gevoel. Ongelukkig het dit gelei tot 'n bittere onenigheid: sommige mense wou graag 'n gekombineerde palm- en broodboomvereniging hê, terwyl ander (insluitend ekself) van mening was dat daar twee afsonderlike verenigings behoort te wees omdat palms en broodbome evolusionêr asook in hulle tuinboukundige behoeftes niks in gemeen het nie. Dit het gelei tot die stigting van die **Broodboomvereniging van suidelike Afrika** deur Roy Osborne in 1984, met die eerste uitgawe van *ENCEPHALARTOS* in Maart 1985. Roy was 'n uitstekende administrateur, en dit tesame met sy grenslose entoesiasme oor alle aspekte van broodbome, het die Vereniging op 'n baie stewige grondslag geplaas. In 1989 het Roy die leiersposisie neergelê, en is opgevolg deur Nat Grobbelaar. Nat was 'n wetenskaplike voor sy aftrede, en dit het geblyk uit die aandag wat hy gegee het aan die korrektheid van besonderhede tydens sy bestuur. Op sy beurt is hy in 1994 opgevolg deur Hannes Robbertse, een van daardie groot liefhebbers van ons inheemse plante wat nog altyd groen vingers gehad het. Sedert 1998 het Frederick de Jager gesorg dat al die Vereniging se werksaamhede glad verloop, en net soos tydens Hannes Robbertse se termyn, was Frederick s'n gekenmerk as die vreedsaamste in die bestaan van die Vereniging.

Piet Vorster

In each edition of ENCEPHALARTOS, we focus on one cycad species, in the form of an in-depth article in layman's language. In this edition the spotlight falls on:

In elke uitgawe van ENCEPHALARTOS fokus ons op een broodboomsoort, in die vorm van 'n in-diepte-artikel in leketaal. In hierdie uitgawe val die kollyg op:

MACROZAMIA PLATYRACHIS F.M. BAILEY

Roy Osborne

Cycad Connections, P.O. Box 244, Burpengary, Queensland 4505, Australia

INTRODUCTION

Every now and again, those who enjoy exploring the outdoors discover an area - often only small in extent and usually well off-the-beaten-track - which is so quite remarkably different in its flora, fauna, geology and ambience, that it remains forever a "special" memory. Such is the impression gained by visitors to the Blackdown Tableland, within a few kilometres of the Tropic of Capricorn, in central Queensland, Australia. And for cycad enthusiasts, the "special" aura is even greater when one comes across the world's only significant wild occurrence of *Macrozamia platyrachis*.

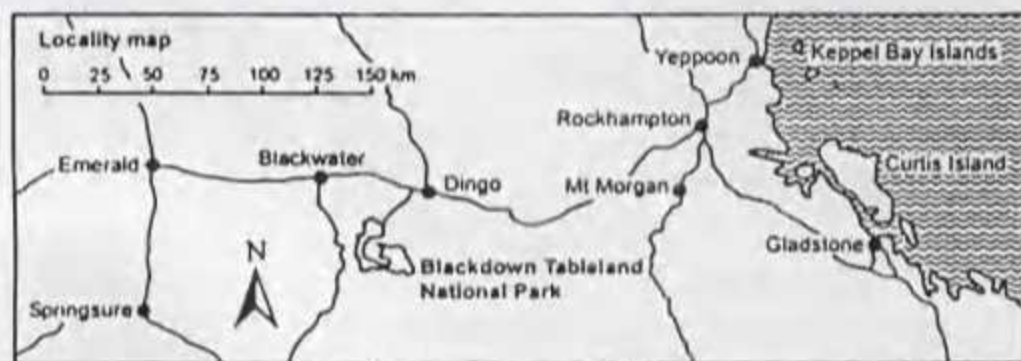


Figure 1 Map: Location of the Blackdown National Park, the site of the best-known wild population of *Macrozamia platyrachis*. Rockhampton, 160 km west of the site, is the major city in central Queensland. From Queensland National Parks and Wildlife Service Pamphlet BP 98-5.

Blackdown Tableland, near the small settlement of Dingo and 160 km west of Rockhampton (see locality map, Figure 1), is a substantial sandstone plateau rising 600–900 m above the surrounding hot, dry plains (Figure 2). Originally part of the territory of the Gungaloo Aboriginal people, the tableland was given its European name in 1869 by cattleman William Yaldwin in memory

of Blackdown House, his family home in Lodsworth, Sussex, England. (Yaldwin's cattle enterprise failed as his stock developed chalky bone syndrome, now known to result from grazing on grass growing on phosphorous-deficient soils.)



Figure 2 The Blackdown Tableland is a sandstone plateau standing 600 m above the surrounding flat, hot, dry country. Photo: Roy Osborne.

Because of its elevation, Blackdown Tableland has the benefit of orographic precipitation of 600 to 1000 mm p.a. falling mainly in summer. Summer day/night temperatures are typically 38/24°C and alternate with a winter regime of 25/8°C, with occasional frosts. In contrast to the vegetation of the surrounding hot dry plains, woodland, tall open forests and heaths cover the plateau. Numerous streams traverse the area. Palms, mosses, ferns, orchids and epiphytes abound and add a special interest to the botanically-inclined.

Although sporadic botanical collections were made from



Figure 3 Cycad enthusiasts Stan Walkley (left) and Lou Randall (right) at the entrance to the Blackdown Tableland National Park. Photo: Roy Osborne.

the late 1800's to the mid-1900's, the first concerted attempts to document the flora did not occur until the 1960's (Henderson 1976). Road access, primarily for forestry purposes, and the realisation that the area was botanically "special", lead to a flurry of activity and our present knowledge of the plants in the area. In 1982, 23 000 ha of the tableland was gazetted as a National Park (Figure 3) to protect its unique flora and fauna. A further 8 000 ha was added in 1994 and a state forest of 16 500 ha adjoins the park. The complex is jointly managed by Queensland Environmental Protection Agency and the Department of Natural Resources. Among the numerous endemic and near-endemic species to the area are the Blackdown stringybark tree (*Eucalyptus sphaerocarpa*), two wattles, a trapdoor spider, a lizard, a Christmas beetle, several palms (including *Livistona fulva*) and the cycad of interest to our readers, *Macrozamia platyrachis*.

DISCOVERY

In the late 1800's, one H.C. Brock-Hollinshead collected leaf and cone material of a low-growing cycad from the hills near the farm "Planet Downs" in central-western Queensland. (This farm is slightly to the south-west of the Blackdown Tableland.) Brock-Hollinshead remarked that the plant, unlike other members of the genus, was not toxic to cattle - a statement open to question. Specimens were filed at the Queensland Herbarium in Brisbane and also at the Royal Botanic Gardens in Sydney. This collection was the basis of a description by Frederick Manson Bailey, Queensland colonial botanist, who had already published descriptions for *M. douglasii* and *M. mountperriensis*. In 1898, Bailey named the new species in the *Queensland Agricultural Journal* (Vol 3, pp. 353-356) as *Macrozamia platyrachis* in reference to the broad rachis which is distinctly flattened above but angular in profile beneath. In a subsequent publication he changed the epithet to

"*platyrhachis*". Lawrie Johnson (1959) pointed out the anomaly and recommended that the original spelling be retained, but both forms are still currently in use.

DISTRIBUTION AND ECOLOGY

The most northerly-occurring representative of the Section *Parazamia*, *Macrozamia platyrachis* is reported to exist in a number of scattered populations in the Expedition Range in central-western Queensland's Leichhardt district. The best-known of these are the stands in the Blackdown Tableland National Park and State Forest, where it is fairly abundant in level sandy areas under open sclerophyll forest (Colour Figure 1).

Little is known of the population dynamics, pollinators and seed dispersal agents of this plant. The area is subjected to occasional fires, previously natural but now controlled, and the species is probably adapted to these fire cycles.

Macrozamia platyrachis is very poorly represented in botanic gardens and is also uncommon in private collections.

DESCRIPTION

1. STEM

Like most of the Section *Parazamia* representatives, *Macrozamia platyrachis* has a large underground stem some 25-60 cm in diameter, which Bailey described as "resembling a large Swede turnip". The stem is visible only when the surrounding soil has been eroded.

2. LEAVES AND LEAFLETS

Plants of *M. platyrachis* bear 2-8 leaves, 45-80 cm long, in a sparse arrangement; these are recurved so that the foliage of mature plants is often nearly prostrate in appearance. Each leaf bears up to 60 mid-green to dark-green semi-glossy to highly-glossy leaflets. These are held stiffly erect in younger plants (Colour Figure 2) but are more lax in leaves of older plants (Colour Figure 3). Leaflets are 25-40 cm long but are characteristically unusually wide at 1.2-2.0 cm, a width matched only by *M. fawcettii*. As with the majority of Section *Parazamia* taxa, stomata are found only on the undersurfaces of the leaflets. There is a small greenish swelling at the point of insertion of each leaflet into the rachis.

The strongly flattened rachis (Colour Figure 4) (for which the species is named) is usually straight but sometimes shows a slight spiral twist (Colour Figure 3). The petiole is 15-25 cm long by 13-18 mm wide, a width exceeded only sometimes by *M. crassifolia*.

3. REPRODUCTIVE STRUCTURES

Male plants of *M. platyrachis* bear 1–3 ovoid, light-green cones (Colour Figure 4), 15–20 cm long by 4–4.5 cm wide, the supporting peduncle up to 10 cm long. Each wedge-shaped microsporophyll has a short, sharp, upwards-projecting spine, these somewhat longer on the sporophylls near the cone apex.

Female plants bear single ovoid, light-green cones (Colour Figures 5, 6), 12–17 cm long by 8–9 cm wide with the peduncle up to 12 cm long. Each wedge-shaped megasporophyll terminates in a pronounced, sharp, upwards-projecting spine. Seeds are ovoid in shape have a red coloured sarcotesta (Colour Figure 6) and measure about 25–30 mm long by 20–25 mm in width.

AFFINITIES

Geographically, *Macrozamia platyrachis* is not too far distant from a number of other cycads. *Macrozamia moorei* and *M. farnsidei* populations are found about 120 km to the west. About 150 km eastwards, towards Rockhampton and the coast, one finds extensive populations of *M. miquelii*, *Cycas megacarpa*, *C. ophiolitica* and *Bowenia serrulata*. Botanically, however, there is little relation between the distinctive *Macrozamia platyrachis*, with its flattened rachis and its broad leaflets, and other representatives of the genus or the Section *Parazamia*. Nevertheless, relationships within both the genus and the section have yet to be fully explored by modern techniques when hitherto-unrecognised associations may come to light.

CONSERVATION AND CULTIVATION

Although the total number of *Macrozamia platyrachis* plants in the wild is probably comparatively small, the species is not considered to be at risk. Since the species is well-conserved within a National Park, it is categorised in the IUCN Red List as LR,1c, while the Australian government ROTAP risk code is 2Rcat. It is gazetted as a Rare or Threatened Plant under Queensland's Nature Conservation legislation.

Although something of a collector's piece, *Macrozamia platyrachis* makes a good container plant as well as being adaptable to in-ground plantings in most subtropical or temperate gardens. A sandy medium with excellent drainage is essential and an open sunny position is recommended. The cycad is relatively cold-hardy and will tolerate moderate frosts. Propagation is by seed only (Figure 4). This species is rarely offered for sale, even from the few specialist cycad nurseries in Australia.

ACKNOWLEDGEMENTS

I thank Paul Forster and Lou Randall for their kind help in the preparation of this text.

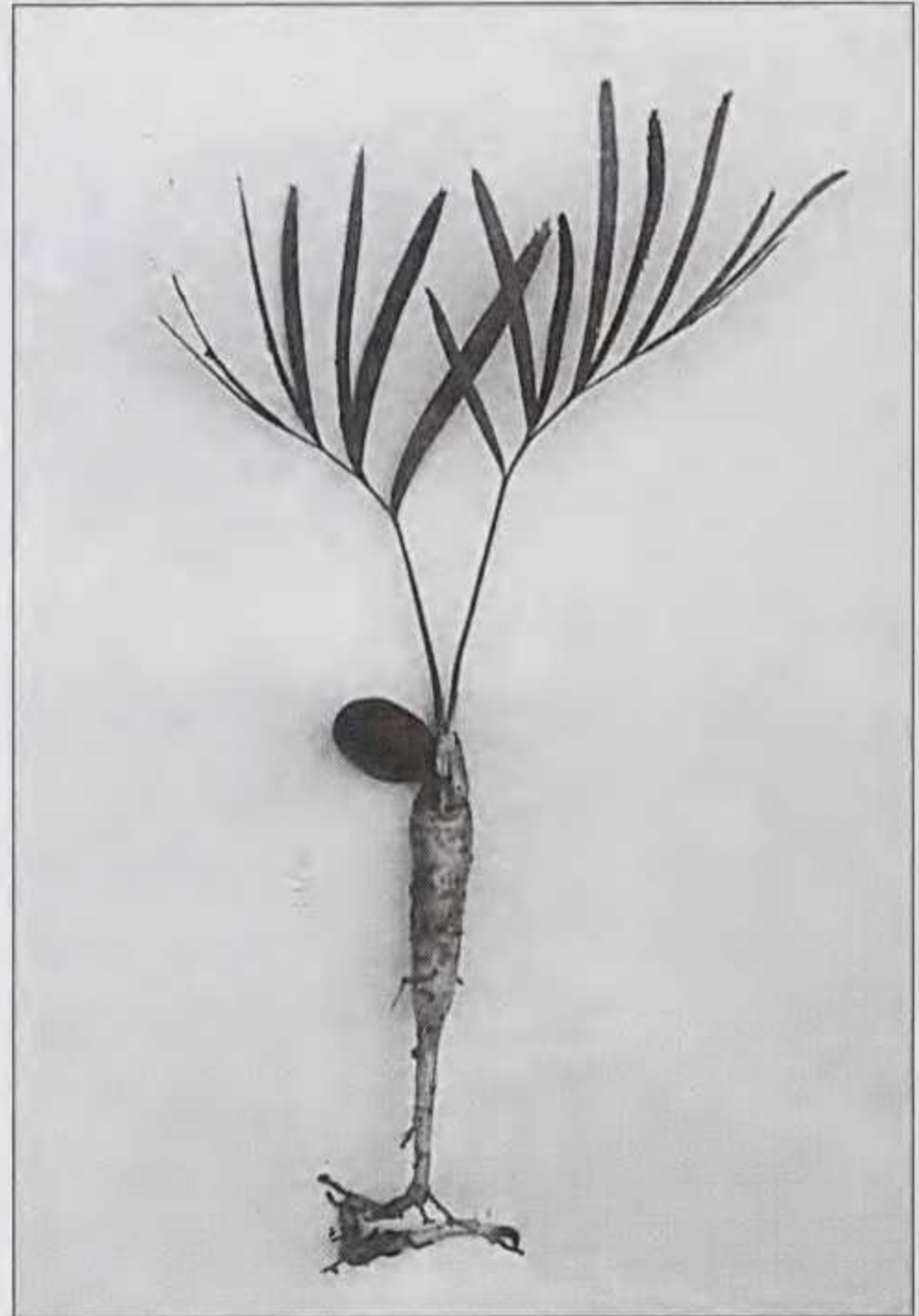


Figure 4 *Macrozamia platyrachis* - a nursery-grown two-year old seedling. Photo: Roy Osborne.

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Colour Figure 1 *Macrozamia platyrachis* is found on level sandy soil under sparse sclerophyll forest. This site had been burnt during the winter. Photo: Lou Randall.



Colour Figure 2 A young plant of *Macrozamia platyrachis* showing the stiffly erect foliage. Photo: Lou Randall.



Colour Figure 3 An older plant of the species showing recurved leaves. The strongly flattened rachis is visible on the rear leaf. Photo: Stan Walkley.



Colour Figure 4 *Macrozamia platyrachis* - male cone showing microsporophylls with short spines. Note also the flattened rachis of the leaf on the left of the cone. Photo: Lou Randall.



Colour Figure 5 *Macrozamia platyrachis* - a young female cone showing megasporophylls with well-developed terminal spines. Photo: Roy Osborne.



Colour Figure 7 One of the *Encephalartos eugene-maraisii* specimens in its natural habitat. Photo: Roy McIntosh.



Kleurfiguur 8 / Colour Figure 8 *Encephalartos lanatus*; manlike keëls / male cones. Foto / Photo: Gerrie de Haas.



Colour Figure 6 *Macrozamia platyrachis* - a female cone, artificially-pollinated in a Brisbane garden, just before seed shedding. Photo: Trevor Crawford.



Colour Figure 9 *Cycas revoluta* with numerous suckers at the base of the stem. Photo: John Kloppers.

Geagte Redaktrise

ENCEPHALARTOS LANATUS MANLIKE KEËLS

Ek het hierdie interessante keëlvorming opgemerk in my tuin waarby die twee dominante keëls die ander twee onderdruk (Kleurfiguur 8), tog ontwikkel hulle al vier volledig.

Gerrie de Haas, Privaatsak X9474, 0700 Pietersburg, R.S.A.

Ontvang 25 November 1999

Summary

ENCEPHALARTOS LANATUS MALE CONES

Gerrie de Haas observed this interesting coning in his garden where the two dominant cones at first repressed the other two (Colour Figure 8), but eventually all four developed fully.

Dear Editor

I refer to Andre Cilliers' report, **SULKING CYCADS**, in *Encephalartos* 60: 29-30.

It is no wonder that his plants reacted so strongly to his treatment. I am not quite sure about the composition of Seagro, but it is manufactured from dead fish and therefore probably contains nitrogen and phosphates, as well as a witch's brew of trace elements, all of which promote plant growth. The Trelmix consists of all the trace elements in the correct ratios, generally required by plants. These are not primarily important for plant growth, but In fact, his aggressive treatment program should have stimulated almost any living plant to grow vigorously.

What counted in his favour, was that his plants had foliage to start with. Were his plants dormant, defoliated stems, it is doubtful whether they would have been able to assimilate the nutrients.

In the case of defoliated plants, the commercial product Kelpak could be applied. This is an extract from certain seaweeds which, by nature of the conditions under which they grow, are capable of very rapid growth which they achieve by synthesising large amounts of growth hormones, mostly cytokinines and This

product is not a nutrient, but a stimulant, so should be able to stimulate dormant plants to grow, after which these plants can utilise nutrients. There is also evidence that germination of seed is stimulated if seeds are soaked in Kelpak before planting. Lastly, when Kelpak is applied together with nutrients, enhanced growth takes place through more efficient use of the nutrients.

There is a misconception that cycads don't require feeding, or at least not very often. In my experience plants should be fed at least once a month. The key is a balanced feeding program, because an excess of one macronutrient results in a deficiency of others, and deficiencies are very difficult to rectify. Cycads usually don't react dramatically or even visibly to trace element treatment, but it is certainly a sound policy to treat them regularly with a balanced trace element mixture such as Trelmix. However, in general one cannot expect dramatic results when initiating a feeding program. In our experience it can be as long as two years before a plant starts reacting visibly to feeding.

Piet Vorster, Botany Department, University of Stellenbosch, Private Bag X1, 7602 Matieland.

Received 6 December 1999

Dear Editor

CYCAD SITES ON THE INTERNET

I have been browsing around on the Internet and found a few useful sites that would interest cycad enthusiasts. First of all if you would like to join other Cycad Societies the following web sites are available:

PACSOA (The Palm and Cycad Societies of Australia) can be contacted at: *Web site: <http://www.pacsoa.org.au/>* *Email: pacsoa1@ozemail.com.au* *Postal address: The Secretary, P.A.C.S.O.A., P.O. Box 1134, Milton, Qld 4064.* As they mention on their site they are a group of affiliated, semiautonomous, regional Palm and/or Cycad Societies headed by a Board presently based in Brisbane, Queensland. They have a quarterly magazine named **Palms & Cycads**, a **Seedbank** and a **Bookstore**. Membership Fees are Aus\$50.00 plus Aus\$5.00 entrance fee, total Aus\$55.00. Join up via the Internet, they do accept credit cards.

PACSOF (Palm and Cycad Societies of Florida) can be contacted at: *Web site: <http://www.plantapalm.com/>* This organisation's goals are to unite the palm and cycad

societies of Florida and to provide a state-wide network of people interested in palms and cycads. There are a few links to the site that are fantastic like the *Virtual Cycad Encyclopaedia* and the *Virtual Palm Encyclopaedia*. For the palm enthusiast there is the *Virtual Palm Tour of Fairchild Tropical Garden*, another link that is interesting is *What's in a (Botanical) Name?* This link is a glossary and pronunciation guide to palm and cycad Latin names. What is also of interest is the long list of Cycad nurseries of all over the world, even Danie Nel's "Cycad Centre" in Durban is included in the list. This site is a combination of about five Cycad & Palm/Palm societies, you have to go in and decide which society you are interested in.

The Cycad Society

*Web site: <http://www.cycad.org/> Contact Debra Waters
Email: Debra_Waters@cycad.org or dwaters@unix.sncc.Isu.edu Postal address: The Cycad Society, R.L. Frasier, Secretary, 5315 Sunshine Drive, Austin, Texas 78756.*

Once you join **The Cycad Society** you receive four issues of *The Cycad Newsletter*, you have access to *The Cycad seed Bank*, *Back Issues Department* and the *Library of Cycad Articles*. The membership is \$32.00 for non US members, unfortunately they do not accept any type of credit cards, payment has to be made via international money order.

There are a few **Book shops** on the web that are of interest to cycad enthusiasts:

Amazon.com

Web site: <http://www.amazon.com/>

This is one of the world's biggest **Internet Book Shops** and has many cycad related books in stock, all you have to do once you are in the site is to enter Cycad in the search facility in the top left hand corner. They have a secure credit card ordering system that is protected by your own password, this makes it safe to order on the Internet. Here are a few offers on the site:

The Biology of the Cycads - Trevor J. Nicholls - Price \$145.00

Cycads of the World - David L. Jones - Price \$49.95; and much, much more.

The Cool Tropics Bookshelf

Web site: <http://www.compassnet.com/>

They are an Internet bookstore that gives you a description of the book content, they also have other literature in booklet form that is not so expensive. This is a site worth visiting, I have not ordered from them as yet, but they should be secure because I see that they are associated with Amazon.com. This site gives you the opportunity to order direct from the distributor (address included). Here are a few books they have on offer:

***Handbook of Cycad Cultivation and Landscaping** - William Tang - Price \$3.50*

***Cycads: Their cultivation and Propagation** - Guy*

Wrinkle - Price \$7.00

***Read's Bibliography of the Living Cycad** - Read - Price \$10.00*

Rainbow Gardens Bookshop

Web site: http://cactus-mall.com/rainbow_bookshop/palm.html

Email: rbgdns@aol.com Postal address: 1444 E. Taylor St., Vista, Ca 92084, U.S.A. Phone: (760) 758-4290 Fax: (760) 945-8934

This web site has seven pages related to Cycads and Palms and their prices seem reasonable, here are a few examples:

11990 Cycad '90 (proceedings of the 2nd Int'l Confer.) - D. Stevenson ect - Price \$42.95

12030 Cycads of China - W. Tang - Price \$6.95

12035 Cycads of Thailand - W. Tang - Price \$5.95

12055 Cycads of Vera Cruz, Mexico - P. Ressler - Price \$5.95

12145 Genus Cycas in Australia - L. Butt - Price \$12.95

12225 Palms and Cycads around the World - J. Krempin - Price \$49.95

12240 Palms and Cycads of Thailand (The) - D. Hadel etc - Price \$69.95

Most of the other well-known Cycad books are on this site. For the palm enthusiast there are a myriad of choices and the prices are competitive. An order form is available on the site.

There are hundreds of other sites on the web related to Cycads and Palms, too numerous to mention this time around. Happy net hunting until next time. If you discover a site that is worth mentioning please contact me at: *Email: cycad@mweb.co.za or Phone: 013 262 4226 or Fax: 013 262 2465, Cell: 083 701 3482*

Cycad Greetings.

John Kloppers, Kleinwaterfontein, P.O. Box 24, 0470 Groblersdal, R.S.A.

Received 10 January 2000

Dear Editor

COLOUR PHOTOS IN OUR JOURNAL

First of all I would like to congratulate the editor and the committee on the milestone they have reached in providing the members with a coloured photo magazine. As was mentioned this was only a trial run to determine the cost and reaction of the members. If the present financial position of the Society is taken into account, there is no way they can keep on producing the magazine in this magnificent format. **Drastic changes will have to take place** if we as members expect a quality magazine. It must be realised that the committee

members of our Cycad Society do not get paid for the work and time they put into all aspects of the day to day running of the Society's affairs. Therefore they can not be burdened with the promotion of our Magazine. This is what we as members must do:

1. **Regional Branches.** Our local regional officers must take it upon themselves and their members to recruit new members, this must be done by tearing the "New Membership Application" out of the *Encephalartos* magazine and visiting potential members with the latest issue of our journal as an example of what they can expect.
2. **Foreign Members.** We ask that our esteemed foreign members try to promote our magazine in their areas, by recruiting new members.
3. **Individual members.** Each and every member should go out of his/her way to enrol new members. I tried it and the response was unbelievable, in one day I got eighteen new members in our small town of Groblersdal. Ask potential members to introduce you to other collectors. A lot of people I spoke to were afraid to join because they believe that our Society has an affiliation with Nature Conservation authorities. Once I assured them that it was not the case they were more than willing to join.
4. **Old Members.** Presently we have about 820 (eight hundred and twenty) members and the membership numbers are deep into the two thousand, what happened to the other thousand plus? I can not believe they all died. Each one of us should go back to the old Lists of Members and check which old members in our area or suburb have refrained from paying their membership. I believe they are still interested, so all we have to do is to go and kindle the old flame and ask them to join once again.
5. **Advertise.** Members who have access to a means of advertising the Cycad Society of South Africa should do so. I placed a few words under the Ears in our local newspaper "Die Daller" and got response from quite a few people. If our existing members have cycad related material to sell there is no better place to advertise than our own magazine.
6. **Web site.** If Members have their own Web site they can place an advert on it for The Cycad Society of South Africa.
7. **Nurseries.** Go to your local Nurseries and ask them to join, and advertise in our magazine.

Let us all stand together and give our Society and magazine a helping hand in the new millennium. We should not ask what The Cycad Society of South Africa can do for us, we should ask what we can do to promote and help them. By doing this we are helping ourselves

to a magazine of which we can be proud.

Cycad Greetings.

John Kloppers, Kleinwaterfontein, P.O. Box 24, 0470 Groblersdal, R.S.A.

Received 12 January 2000

Geagte Redaktrise

VRUGBARE CYCAS REVOLUTA

Ek het onlangs 'n manlike *Cycas revoluta* verplant in my tuin, tot my verbasing het die plant 183 (eenhonderd-drie-en-tagtig) suiers opgelewer (Kleurfiguur 9 op bl. 8, en Figuur 1). Is dit 'n wêreld rekord, of is daar iemand anders se plant wat hierdie rekord kan breek?

John Kloppers, Kleinwaterfontein, Posbus 24, 0470 Groblersdal, R.S.A.

Ontvang 12 Januarie 2000



Figuur 1 Die suiers wat van die *Cycas revoluta*-plant afgehaal is. / **Figure 1** The suckers removed from the *Cycas revoluta* plant.

Summary

FERTILE CYCAS REVOLUTA

When transplanting a male *Cycas revoluta* in his garden, John Kloppers found that it has produced 183 suckers (Colour Figure 9 on p. 8, and Figure 1). Is this a world record?

NEWS FROM THE NORTHERN PROVINCE CYCAD TASK GROUP

Roy McIntosh

Private Bag X9474, 0700 Pietersburg, R.S.A.

Received 25 November 1999

Through the enthusiastic guidance of an educated and dedicated committee, we of the Northern Province Cycad Task Group made our way to ENTABENI - place of the mountain, for the "ultimate experience". They deservedly boast about the "big five" animals in a malaria-free area, which makes the game farm all the more accessible.

Some forty members and family went to rediscover one of the "big five" of the Eugene Marais cycads, viz. *Encephalartos eugene-maraisii* Verdoorn (Waterberg cycad) in its natural habitat.

A few hundred plants, now under private enterprise, have survived despite poaching and natural interference against the female cones. It would be wonderful to reverse the damage done, propagate the species and restore the area to its original splendour.

The so-called Eugene Marais cycads could be conveniently classified into five separate species:

- 1) *E. eugene-maraisii*
- 2) *E. middelburgensis*
- 3) *E. dyerianus*
- 4) *E. dolomiticus*
- 5) *E. hirsutus*

Our point of interest was exclusively the *E. eugene-maraisii* (Waterberg cycad) which could then be regrouped into localised ecotypes according to the leaves produced as the stems and cones are indistinguishable from the other.

- 1) Palala
- 2) Nylstroom
- 3) Thabazimbi
- 4) Sterkloop-Potgietersrus

The Waterberg cycads in question are of the Sterkloop-Potgietersrus ecotype and were mainly mature plants (Colour Figure 7, p. 8) with massive stems upward of one hundred years old. A few suckers near to or in close proximity to the mother plant were evident and isolated examples of seedlings that were most probably washed up the embankment by the river when in flood.

As a regional branch of the Cycad Society of South Africa, we fully endorse the aims of the Society. With the help of nature conservation and the committed farmers involved, we will endeavour to make a difference by pooling knowledge and hands-on experience to help protect, pollinate and restock the cycads indigenous to our province, especially in their natural habitat.

NUUS OOR DIE TRANSVAALSE STREEKTAK VAN DIE VERENIGING

Derik Minnaar

Posbus 95597, 0145 Waterkloof, R.S.A.

Ontvang 12 Januarie 2000

Toekomstige aktiwiteite

Op 15 April 2000 vertrek ons vroegoggend na Groblersdal om gaste te wees van John en Maryna

Kloppers. Ons wil poog om deur die oggend broodboomtuine in die omgewing te besoek, voordat ons by die Kloppers-tuin afsluit met 'n bring-en-braai. Bel gerus vir Derik of Lynette [(012) 8033061 (na-ure)] vir

verdere inligting.

Op 10 Junie 2000 besoek ons die Entabeni Natuurreservaat by Naboomspruit. Die koste verbonde aan hierdie dagtoer is R165.00 p.p. en sluit die volgende in: toegang tot die reservaat, middagete by die lapa asook 'n wildrit deur die reservaat na die natuurlike habitat van *Encephalartos eugene-maraisii*. Belangstellendes moet asseblief so gou moontlik bespreek by Derik of Lynette Minnaar (voor 12 Mei 2000), aangesien 'n deposito betaal moet word om ons plek te verseker.

Kontak ons gerus by (012) 8033061 (na-ure) met enige voorstelle rakende sprekers en uitstappies, of vir verdere inligting met betrekking tot toekomstige aktiwiteite.

Afsluitingsfunksie 1999

Die Transvaalse streektak van die Broodboom Vereniging het hul laaste jaareind funksie van die eeu gehou op 6 November 1999 by die Botaniese Tuin in Pretoria. Twee-en-twintig mense het die funksie bygewoon, nieteenstaande die feit dat dit saamgeval het met die eindstryd van die rugby wêreldbeker.

Hoewel die streektak elke twee jaar verkiesing van die komitee hou, was daar 'n tussentydse voorstel om weer geleentheid te skep vir 'n stuifmeel- en saadbankbeampte. Manie Maritz is voorgestel en verkies as die tak se saadbankbeampte en gevra om 'n werkbare strategie saam te stel vir die portefeulje. Baie geluk en sterkte vir hierdie groot taak.

Die voorsitter het lede versoek om voorstelle te maak met betrekking tot sprekers, asook tuin- en natuurbesoeke om sodoende die aktiwiteite van die tak te verryk en meer mense by die vereniging te betrek.

Daar was 'n voorstel gemaak dat die vereniging 'n webblad op die internet moet bedryf om sodoende meer broodboom entoesiaste te bereik en om te dien as kommunikasie medium. Na 'n lang bespreking is daar besluit om verskeie voorstelle met die president van die vereniging te bespreek.

Die funksie is afgesluit met 'n lekker tradisionele braaivleis op die stoep terwyl dit heerlijk rondom gereën het. Die Transvaalse streektak wens alle broodboom entoesiaste 'n baie voorspoedige nuwe millennium toe.

CYCADS OF THE WORLD FOR THE LAYMAN

Leon Pienaar* and Pieter Janse van Rensburg

*626 Jan Visse Avenue, 0084 Roseville, South Africa

Received 14 January 2000

Bowenia

- | | | |
|----|-----------------------|-----------------------|
| 1. | <i>B. serrulata</i> | Queensland, Australia |
| 2. | <i>B. spectabilis</i> | Queensland, Australia |

Ceratozamia

- | | | |
|-----|-------------------------|---|
| 1. | <i>C. alvarezii</i> | Chiapas, Mexico |
| 2. | <i>C. euryphyllidia</i> | Oaxaca and Veracruz, Mexico |
| 3. | <i>C. hildae</i> | San Luis Potosi and Queretaro, Mexico |
| 4. | <i>C. kuesteriana</i> | Tamaulipas, Mexico |
| 5. | <i>C. latifolia</i> | San Luis Potosi, Queretaro and Hidalgo, Mexico |
| 6. | <i>C. matudae</i> | Chiapas, Mexico |
| 7. | <i>C. mexicana</i> | Hidalgo, Puebla, San Luis Potosi and Veracruz, Mexico |
| 8. | <i>C. microstrobila</i> | San Luis Potosi, Mexico |
| 9. | <i>C. miqueliana</i> | Chiapas and Veracruz, Mexico |
| 10. | <i>C. mixeorum</i> | Oaxaca, Mexico |
| 11. | <i>C. morettii</i> | Veracruz, Mexico |

- | | | |
|-----|-------------------------|--|
| 12. | <i>C. norstogii</i> | Chiapas, Mexico |
| 13. | <i>C. robusta</i> | Oaxaca and Veracruz, Mexico; Belize; Guatemala |
| 14. | <i>C. sabatoii</i> | Hidalgo and Queretaro, Mexico |
| 15. | <i>C. whitelockiana</i> | Oaxaca, Mexico |
| 16. | <i>C. zaragozae</i> | San Luis Potosi, Mexico |

Chigua

- | | | |
|----|---------------------|----------|
| 1. | <i>C. bernalii</i> | Colombia |
| 2. | <i>C. restrepoi</i> | Colombia |

Cycas

- | | | |
|-----|---|--|
| 1. | <i>C. angulata</i> | Northern Territory, Australia |
| 2. | <i>C. apoa</i> | New Guinea; Indonesia |
| 3. | <i>C. arenicola</i> | Northern Territory, Australia |
| 4. | <i>C. armstrongii</i> | Northern Territory, Australia |
| 5. | <i>C. arnhemica</i> subsp. <i>arnhemica</i> | Northern Territory, Australia |
| 6. | <i>C. arnhemica</i> subsp. <i>muninga</i> | Northern Territory, Australia |
| 7. | <i>C. arnhemica</i> subsp. <i>natja</i> | Northern Territory, Australia |
| 8. | <i>C. badensis</i> | Queensland, Australia |
| 9. | <i>C. balansae</i> | Vietnam |
| 10. | <i>C. basaltica</i> | Western Australia |
| 11. | <i>C. beddomei</i> | India |
| 12. | <i>C. bougainvilleana</i> | New Britain, Solomon Islands |
| 13. | <i>C. brachycantha</i> | Vietnam; Laos; Thailand; China |
| 14. | <i>C. brunnea</i> | Northern Territory and Queensland, Australia |
| 15. | <i>C. cairnsiana</i> | Queensland, Australia |
| 16. | <i>C. calcicola</i> | Northern Territory, Australia |
| 17. | <i>C. campestris</i> | Papua New Guinea |
| 18. | <i>C. canalis</i> subsp. <i>canalis</i> | Northern Territory, Australia |
| 19. | <i>C. canalis</i> subsp. <i>carinata</i> | Northern Territory, Australia |
| 20. | <i>C. chamaoensis</i> | Thailand |
| 21. | <i>C. chamberlainii</i> | Philippines |
| 22. | <i>C. changjiangensis</i> | Hainan Island |
| 23. | <i>C. chevalieri</i> | Vietnam |
| 24. | <i>C. circinalis</i> var. <i>circinalis</i> | South India |
| 25. | <i>C. circinalis</i> var. <i>orixensis</i> | Northern eastern Ghats, Indian State of Orissa |
| 26. | <i>C. circinalis</i> var. <i>swamyii</i> | India, Hassan District of Karnataka |
| 27. | <i>C. clivicola</i> subsp. <i>clivicola</i> | Thailand |
| 28. | <i>C. clivicola</i> subsp. <i>lutea</i> | Thailand |
| 29. | <i>C. collina</i> | Vietnam |
| 30. | <i>C. condaoensis</i> | Con Dao Islands |
| 31. | <i>C. conferta</i> | Northern Territory, Australia |
| 32. | <i>C. couttsiana</i> | Queensland, Australia |
| 33. | <i>C. curranii</i> | Philippines |
| 34. | <i>C. debaoensis</i> | China |
| 35. | <i>C. desolata</i> | Queensland, Australia |
| 36. | <i>C. diannenensis</i> | China |
| 37. | <i>C. dolichophylla</i> | China; Vietnam |
| 38. | <i>C. edentata</i> | Philippines |
| 39. | <i>C. elongata</i> | Vietnam |
| 40. | <i>C. falcata</i> | Sulawesi and Kabaena Island |
| 41. | <i>C. ferruginea</i> | China |
| 42. | <i>C. fugax</i> | Vietnam |
| 43. | <i>C. furfuracea</i> | Western Australia |
| 44. | <i>C. guizhouensis</i> | China |

45.	<i>C. hainanensis</i>	Hainan Island; China
46.	<i>C. haobinhensis</i>	Vietnam
47.	<i>C. hongheensis</i>	China
48.	<i>C. inermis</i>	China
49.	<i>C. javana</i>	Java; Indonesia
50.	<i>C. lane-poolei</i>	Western Australia
51.	<i>C. lindstromii</i>	Vietnam
52.	<i>C. litoralis</i>	Myanmar; Thailand; Malaysia; Sumatra; Vietnam
53.	<i>C. maconochiei</i> subsp. <i>maconochiei</i>	Northern Territory, Australia
54.	<i>C. maconochiei</i> subsp. <i>lanata</i>	Northern Territory, Australia
55.	<i>C. maconochiei</i> subsp. <i>viridis</i>	Northern Territory, Australia
56.	<i>C. macrocarpa</i>	Malaysia; Thailand
57.	<i>C. media</i> subsp. <i>media</i>	Queensland, Australia
58.	<i>C. media</i> subsp. <i>banksii</i>	Queensland, Australia
59.	<i>C. media</i> subsp. <i>ensata</i>	Queensland, Australia
60.	<i>C. megacarpa</i>	Queensland, Australia
61.	<i>C. micholitzii</i>	Vietnam; China
62.	<i>C. micronesia</i>	Mariana Island; Guam
63.	<i>C. miquelii</i>	China
64.	<i>C. multipinnata</i>	China
65.	<i>C. nathorstii</i>	Sri Lanka
66.	<i>C. nongnoochiae</i>	Thailand
67.	<i>C. ophiolitica</i>	Queensland, Australia
68.	<i>C. orientis</i>	Northern Territory, Australia
69.	<i>C. pachypoda</i>	Vietnam
70.	<i>C. panzhihuaensis</i>	China
71.	<i>C. papuana</i>	Papua New Guinea
72.	<i>C. parvulus</i>	China
73.	<i>C. pectinata</i>	S.E. Asia; N.E. India; China
74.	<i>C. platyphylla</i>	Queensland, Australia
75.	<i>C. pranburiensis</i>	Thailand
76.	<i>C. pruinosa</i>	Western Australia & Northern Territory
77.	<i>C. revoluta</i>	China; Japan
78.	<i>C. riuminiana</i>	Philippines
79.	<i>C. rumphii</i>	S.E. Asia; Pacific Islands
80.	<i>C. seemannii</i>	Fiji; Tonga; Vanuata; New Caledonia
81.	<i>C. segmentifida</i>	China
82.	<i>C. semota</i>	Australia
83.	<i>C. scratchleyana</i>	New Guinea
84.	<i>C. schumanniana</i>	Papua New Guinea
85.	<i>C. siamensis</i>	S.E. Asia; China
86.	<i>C. silvestris</i>	Queensland, Australia
87.	<i>C. simplicipinna</i>	S.E. Asia
88.	<i>C. spherica</i>	North-eastern India
89.	<i>C. szechuanensis</i>	China
90.	<i>C. taitungensis</i>	Taiwan; China
91.	<i>C. taiwaniana</i>	China
92.	<i>C. tanqingii</i>	China
93.	<i>C. tansachana</i>	Thailand
94.	<i>C. thouarsii</i>	Madagascar; Africa
95.	<i>C. tropophylla</i>	Vietnam
96.	<i>C. tuckeri</i>	Queensland, Australia
97.	<i>C. wadei</i>	Philippines
98.	<i>C. xipholepis</i>	Queensland, Australia
99.	<i>C. yorkiana</i>	Queensland, Australia
100.	<i>C. yunnanensis</i>	China
101.	<i>C. zeylanica</i>	Sri Lanka; Andaman Islands; Nicobar

Dioon

1. *D. califanoi* Oaxaca, Mexico
2. *D. capitoi* Puebla, Mexico
3. *D. edule* var. *edule* Mexico
4. *D. edule* var. *angustifolium* Nuevo Leon and Tamaulipas, Mexico
5. *D. holmgrenii* Oaxaca, Mexico
6. *D. mejiae* Honduras
7. *D. merolae* Chiapas, Mexico
8. *D. purpusii* Oaxaca, Mexico
9. *D. rzedowskii* Oaxaca, Mexico
10. *D. sonorensis* N.W. Coast, Mexico
11. *D. spinulosum* Vera Cruz and Oaxaca, Mexico
12. *D. tomasellii* S.W. Coast, Mexico

Encephalartos

1. *E. aemulans* KwaZulu-Natal, South Africa
2. *E. altensteinii* E. Cape, South Africa
3. *E. aplanatus* Swaziland
4. *E. arenarius* E. Cape, South Africa
5. *E. barteri* subsp. *barteri* Benin; Ghana; Nigeria; Sudan; Togo
6. *E. barteri* subsp. *allochrous* Nigeria
7. *E. brevifoliolatus* Northern Province, South Africa
8. *E. bubalinus* Tanzania; Kenya
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* Northern Province, South Africa
14. *E. cycadifolius* E. Cape, South Africa
15. *E. delucanus* Tanzania
16. *E. dolomiticus* Northern Province, South Africa
17. *E. dyerianus* Northern Province, South Africa
18. *E. equatorialis* Uganda
19. *E. eugene-maraisii* Northern Province, South Africa
20. *E. ferox* KwaZulu-Natal, South Africa; Mozambique
21. *E. friderici-guilielmi* E. Cape, South Africa
22. *E. ghellinckii* KwaZulu-Natal, South Africa
23. *E. gratus* Malawi; Mozambique
24. *E. heenanii* Swaziland; Mpumalanga, South Africa
25. *E. hildebrandtii* Kenya; Tanzania
26. *E. hirsutus* Northern Province, South Africa
27. *E. horridus* E. Cape, South Africa
28. *E. humilis* Mpumalanga, South Africa
29. *E. inopinus* Northern Province, South Africa
30. *E. ituriensis* Dem. Rep. Congo (the former Zaire)
31. *E. kisambo* Kenya
32. *E. laevifolius* Mpumalanga, South Africa; Swaziland
33. *E. lanatus* Mpumalanga, South Africa
34. *E. latifrons* E. Cape, South Africa
35. *E. laurentianus* Angola; Dem. Rep. Congo
36. *E. lebomboensis* KwaZulu-Natal and Mpumalanga, South Africa; Swaziland; Mozambique
37. *E. lehmannii* E. Cape, South Africa
38. *E. longifolius* E. Cape, South Africa
39. *E. macrostrobilus* Uganda
40. *E. manikensis* Zimbabwe; Mozambique

41.	<i>E. marunguensis</i>	Dem. Rep. Congo
42.	<i>E. middelburgensis</i>	Mpumalanga, South Africa
43.	<i>E. msinganus</i>	KwaZulu-Natal, South Africa
44.	<i>E. munchii</i>	Mozambique
45.	<i>E. natalensis</i>	KwaZulu-Natal, South Africa
46.	<i>E. ngoyanus</i>	KwaZulu-Natal and Mpumalanga, South Africa; Swaziland
47.	<i>E. nubimontanus</i>	Northern Province, South Africa
48.	<i>E. paucidentatus</i>	Mpumalanga, South Africa; Swaziland
49.	<i>E. poggei</i>	Angola; Dem. Rep. Congo
50.	<i>E. princeps</i>	E. Cape, South Africa
51.	<i>E. pterogonus</i>	Mozambique
52.	<i>E. schaijesii</i>	Dem. Rep. Congo
53.	<i>E. schmitzii</i>	Dem. Rep. Congo; Zambia
54.	<i>E. sclavoi</i>	Tanzania
55.	<i>E. senticosus</i>	Mpumalanga and KwaZulu-Natal, South Africa
56.	<i>E. septentrionalis</i>	Sudan
57.	<i>E. tegulaneus</i>	Kenya
58.	<i>E. transvenosus</i>	Northern Province, South Africa
59.	<i>E. trispinosus</i>	E. Cape, South Africa
60.	<i>E. turneri</i>	Mozambique
61.	<i>E. umbeluziensis</i>	Swaziland; Mozambique
62.	<i>E. villosus</i>	E. Cape, KwaZulu-Natal and Mpumalanga, South Africa
63.	<i>E. whitelockii</i>	Western Uganda
64.	<i>E. woodii</i>	KwaZulu-Natal, South Africa

Lepidozamia

1.	<i>L. hopei</i>	Queensland, Australia
2.	<i>L. peroffskyana</i>	N.S.W. and Queensland, Australia

Macrozamia

1.	<i>M. cardiacensis</i>	Queensland, Australia
2.	<i>M. communis</i>	N.S.W., Australia
3.	<i>M. concinna</i>	N.S.W., Australia
4.	<i>M. conferta</i>	Queensland, Australia
5.	<i>M. cranei</i>	Queensland, Australia
6.	<i>M. crassifolia</i>	Queensland, Australia
7.	<i>M. diplomera</i>	N.S.W., Australia
8.	<i>M. douglasii</i>	Queensland, Australia
9.	<i>M. dyeri</i>	Western Australia
10.	<i>M. elegans</i>	N.S.W., Australia
11.	<i>M. fawcettii</i>	N.S.W., Australia
12.	<i>M. fearnsidei</i>	Queensland, Australia
13.	<i>M. flexuosa</i>	N.S.W., Australia
14.	<i>M. fraseri</i>	Western Australia
15.	<i>M. glaucophylla</i>	N.S.W., Australia
16.	<i>M. heteromera</i>	N.S.W., Australia
17.	<i>M. humilis</i>	N.S.W., Australia
18.	<i>M. johnsonii</i>	N.S.W., Australia
19.	<i>M. lomandroides</i>	Queensland, Australia
20.	<i>M. longispina</i>	Queensland, Australia
21.	<i>M. lucida</i>	Queensland, Australia
22.	<i>M. macdonnellii</i>	Northern Territory, Australia
23.	<i>M. machinii</i>	Queensland, Australia
24.	<i>M. miquelii</i>	N.S.W. and Queensland, Australia

25.	<i>M. montana</i>	N.S.W., Australia
26.	<i>M. moorei</i>	Queensland, Australia
27.	<i>M. mountperriensis</i>	Queensland, Australia
28.	<i>M. occidua</i>	Queensland, Australia
29.	<i>M. parcifolia</i>	Queensland, Australia
30.	<i>M. pauli-guilielmi</i>	Queensland, Australia
31.	<i>M. platyrachis</i>	Queensland, Australia
32.	<i>M. plurinervia</i>	N.S.W. and Queensland, Australia
33.	<i>M. polymorpha</i>	N.S.W., Australia
34.	<i>M. reducta</i>	N.S.W., Australia
36.	<i>M. riedlei</i>	Western Australia
37.	<i>M. secunda</i>	N.S.W., Australia
38.	<i>M. spiralis</i>	N.S.W., Australia
39.	<i>M. stenomera</i>	N.S.W., Australia
40.	<i>M. viridis</i>	Queensland, Australia

Microcycas

1.	<i>M. calocoma</i>	W. Cuba
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Stangeria

1.	<i>S. eriopus</i>	E. Cape and KwaZulu-Natal, South Africa
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Zamia

1.	<i>Z. acuminata</i>	Nicaragua; Panama
2.	<i>Z. amazonia</i>	Brazil; Colombia; Venezuela
3.	<i>Z. amazonum</i>	Brazil; Colombia; Peru; Venezuela
4.	<i>Z. amblyphyllidia</i>	Cuba; Jamaica; Puerto Rico
5.	<i>Z. amplifolia</i>	Colombia
6.	<i>Z. angustifolia</i>	Bahamas; Cuba
7.	<i>Z. boliviana</i>	Bolivia
8.	<i>Z. chiqua</i>	Colombia; Panama
9.	<i>Z. cremnophila</i>	Mexico
10.	<i>Z. cunaria</i>	Panama
11.	<i>Z. disodon</i>	Northern Colombia
12.	<i>Z. dressleri</i>	Panama
13.	<i>Z. encephalaroides</i>	Colombia
14.	<i>Z. fairchildiana</i>	Costa Rica; Panama
15.	<i>Z. fischeri</i>	Mexico
16.	<i>Z. furfuracea</i>	Mexico
17.	<i>Z. gentryi</i>	Ecuador
18.	<i>Z. herrerae</i>	Mexico; Guatemala
19.	<i>Z. hymenophyllidia</i>	South Eastern Amazonian Colombia
20.	<i>Z. inermis</i>	Mexico
21.	<i>Z. integrifolia</i>	Florida and Georgia (U.S.A.); Bahamas; Cuba; Caiman Islands
22.	<i>Z. ipetiensis</i>	Panama
23.	<i>Z. lacondona</i>	Eastern Chiapas, Mexico
24.	<i>Z. lacondonis</i>	Mexico
25.	<i>Z. lecointei</i>	Brazil
26.	<i>Z. lindleyi</i>	Panama
27.	<i>Z. loddigesii</i>	Mexico
28.	<i>Z. lucayana</i>	Bahamas
29.	<i>Z. manicata</i>	N. Colombia; S. Panama
30.	<i>Z. melanorrhachis</i>	North-central Colombia to Amazonian Colombia

31.	<i>Z. montana</i>	Colombia; Venezuela
32.	<i>Z. muricata</i>	Venezuela
33.	<i>Z. neurophyllidia</i>	Panama
34.	<i>Z. obliqua</i>	Colombia; S. Panama
35.	<i>Z. paucijuga</i>	W. Mexico
36.	<i>Z. poeppigiana</i>	Peru; Ecuador
37.	<i>Z. polymorpha</i>	Mexico; Belize
38.	<i>Z. portoricensis</i>	Puerto Rico
39.	<i>Z. pseudomonticola</i>	Costa Rica
40.	<i>Z. pseudoparasitica</i>	Panama; Costa Rica
41.	<i>Z. pumila</i>	Dominican Rep.; Florida (U.S.A.); Cuba
42.	<i>Z. purpurea</i>	Mexico
43.	<i>Z. pygmaea</i>	Cuba
44.	<i>Z. roezlii</i>	Colombia
45.	<i>Z. skinneri</i>	Panama
46.	<i>Z. soconuscensis</i>	Mexico
47.	<i>Z. spartea</i>	Mexico
48.	<i>Z. splendens</i>	Mexico
49.	<i>Z. standleyi</i>	Honduras
50.	<i>Z. tuerckheimii</i>	Guatemala
51.	<i>Z. ulei</i>	Brazil
52.	<i>Z. urep</i>	Peru
53.	<i>Z. variegata</i>	Guatemala; Belize; Mexico
54.	<i>Z. vazquezii</i>	Mexico
55.	<i>Z. wallisii</i>	Colombia

The compilers wish to thank **Ken Hill** for his assistance.

The following species are excluded from the list due to the following reasons:

Ceratozamia parcifica

Ceratozamia "parcifica" is a distinct species that occurs in the Sierra Madre del Sur, on the southern or Pacific coast of Oaxaca state of Mexico. It is another of the "robusta complex", which probably includes about 5 or 6 species, all currently known as *C. robusta* forms.

Cycas bellefonti and C. tonkinensis

The description of these plants by L. Linden & Rodigas (1886), cannot be matched with any known species, and in the absence of a type specimen the names are thus excluded.

NEW CYCAD PUBLICATIONS

ARTABE, A.E. & STEVENSON, D.W. 1999. **Fossil cycads of Argentina**. *Botanical Review* 65(3): 219-238.

[A survey of Cycadalean taxa of Argentina (including Antarctica) is presented. The record of the leaves represented by *Nilssonia*, *Pseudoctenis*, *Ctenis*, *Mesodescolea*, *Ticoa*, *Almargemia*, *Kurtziana*, and *Zamia* genera are summarized. Recent investigations made of

cuticles with transmission and scanning electron microscopy are included. In stems, a preliminary study of two forms found in the Upper Cretaceous of Rio Negro Province are incorporated into *Michelilloa*, *Bororoa*, and *Menucoa*. The fossil record shows some characters of leaf morphology, presence of inverse xylem and medullary bundles, two kinds of leaf traces, and

monoxylic and polyxylic steles of systematic importance when compared with both extant and fossil cycads. Affinities of fossil taxa related to extant families are suggested through analysis of the above-mentioned characters. The presence of medullary vascular rings related to the emission of terminal reproductive strobili are recognized in *Bororoa* and *Menucoa*. This character associated with polyxyly makes it possible to assign these genera to the *Zamiaceae/Encephalartoideae* sensu Stevenson, widening the paleogeographical distribution of this subfamily.]

*First author's address: Div. Paleobotanica, Facultad de Ciencias Naturales, Museo de La Plata, Paseo del Bosque s/n. 1900, La Plata ** Argentina.*

FORSTER, P.I. 1999. **Proposal to conserve the name *Encephalartos miquelii* (Zamiaceae) with a conserved type.** *Taxon* 48(3): 569–570.

[The Australian cycad known as *Macrozamia miquelii* comprises a number of populations scattered over a wide area in Queensland. It was originally described by Mueller in 1868 (then as a species of *Encephalartos*) on the basis of material from three localities: (a) in northern New South Wales near the Richmond River, (b) near Brisbane and c) from Rockhampton in the Fitzroy River area. Johnson's treatment in 1969 separated out the first of these three under the name *M. fawcettii*, claiming confusion on Mueller's part. In the current article, Paul Forster points out that Mueller was NOT confused since he later quite definitely wanted the name *M. miquelii* to be applied to the Richmond River plant, a recommendation which was overlooked by Johnson. Technically a case could now be made for *M. fawcettii* being changed to *M. miquelii* and *M. miquelii* going to *M. macleayi*. However, to avoid the confusion that this would cause, Forster sensibly propose that we accept the *status quo* and concur with Johnson's choice of the Rockhampton material for the lectotype for *M. miquelii*.]

Author's address: Queensland Herbarium, Brisbane Botanic Gardens, Mt Coot-tha Road, Toowong, Qld 4066, Australia.

GRIGORYEVA, V.V. & GABARAEVA, N.I. 1998. **Dynamics of cell components in developing microspores of *Stangeria eriopus* (Stangeriaceae) in the course of exine formation: A stereological study.** *Botanicheskii Zhurnal* (St. Petersburg) 83(12): 1–11.

[The stereological study of the dynamics of volume density and absolute volumes of 10 cell components (cell wall, periplasmic space, dictyosomes, endoplasmic reticulum, mitochondria, plastids, nucleus, lipid globules, cytoplasm, cytosol), and also of linear size, individual volume and number per cell of plastids, mitochondria and dictyosomes in the developing microspores of *Stangeria eriopus* (Stangeriaceae) has been undertaken. For analysis, 4 stages of microspore development were

selected: 1) early mid-tetrad stage, 2) late mid-tetrad stage, 3) late tetrad stage and 4) early free microspore stage. It has been found that during the period under study the volume of a microspore declined to about 80% of its initial volume, and cytosol volume dropped to 36%. These results are unexpected and not in accordance with general knowledge, implying the gradual growth of microspore volume in development. The unusual decrease of microspore volume of *Stangeria eriopus* is evidently brought about by an unusual mode of aperture formation in this species, by invagination of the distal and proximal poles of the microspore. As a result, the initial roundish form of a microspore changes to a convex-concave one. The nucleus volume density and its absolute volume increases about 1.5 times; the nuclear-cytoplasm ratio increases considerably. Absolute volume of developing cell wall increases 3 times, and its volume density 4 times, the maximal increment is observed at mid-tetrad stage, when most active growth of the glycocalyx takes place. The absolute volume and volume density of the periplasmic space, which is a centre of all microspore wall growth processes, changes periodically, now increasing, now decreasing; this is in accordance with previously supposed involvement of oscillatory movements of the plasma membrane in the process of glycocalyx growth. The absolute volume and volume density of dictyosomes increases 1.5 times by the end of the tetrad period and drops abruptly in the beginning of post tetrad period, when the number of dictyosomes per cell decreases 6 times. The considerable number of dictyosomes and their vesicles in microspore cytoplasm in tetrad period has confirmed the general knowledge about participation of Golgi in formation of the glycocalyx and proexine, based on visual estimation. By the completion of proexine deposition (the beginning of the post tetrad period, when the formation of intine is not yet initiated), the presence of the Golgi elements has become inconsiderable. The volume density (7.2%) and absolute volume of SER in *Stangeria eriopus* microspore cytoplasm is maximal in the end of mid-tetrad stage, this is in good accordance with our opinion on the role of SER as a site of synthesis of sporopollenin precursors, the latter accumulate through glycocalyx exactly at this ontogenetic time. The quantitative (morphometric) data give evidence of the participation of ER and Golgi in exine formation in *Stangeria eriopus*. In general, the dynamics of volume density and absolute volume of one or another organelle or cell component show the degree of participation of these organelles in the main processes, going on in a cell, and suggests the functional direction of their activity.]

First author's address: Not provided.

MATKOWSKYJ, K.A., MARRERO, J.A., CARROLL, R.E., DANILKOVICH, A.V., GREEN, R.M. & BENYA, R.V. 1999. **Azoxymethane-induced fulminant hepatic failure in C57BL/6J mice: Characterization of a new animal model.** *American Journal of Physiology* 277(2

Part 1): 455–462.

[Without transplantation, approx 50–90% of all patients with fulminant hepatic failure (FHF) die. This poor outcome is due in part to the absence of an appropriate animal model, which would allow for a greater understanding of the pathophysiology of this syndrome. Given the reports of liver injury in humans and livestock fed cycad palm nuts on the island of Guam, we hypothesized that the active ingredient azoxymethane (AOM) could cause FHF. We therefore evaluated AOM in C57BL/6J mice. Histologically we observed microvesicular steatosis 2 h, sinusoidal dilatation 4 h, and centrilobular necrosis 20 h after AOM administration, and transmission electron microscopy showed that this agent causes mitochondrial injury. FHF was associated with all four stages of encephalopathy, as well as by a prodromal period of decreased eating and drinking lasting approx 15 h before the development of stage 1 encephalopathy (i.e., loss of scatter reflex). Late encephalopathy was associated with increased arterial ammonia, decreased serum glucose, and evidence of brain edema (astrocyte swelling). We show that AOM-induced FHF is highly reproducible, without evidence of lot-to-lot variability, and is dose dependent. These findings therefore suggest that AOM is an excellent agent for the study of FHF, as well as indicate that Guamanian FHF may be due to AOM found in unwashed cycad palm nuts.]

First author's address: Dept. of Medicine, Univ. of Illinois at Chicago, 840 South Wood St., Chicago, IL, 60612, USA.

MAZZEO, G., RUSSO, A. & SUMA, P. 1999. *Phenacoccus solani* Ferris (Homoptera Coccoides) on ornamental plants in Italy. *Bollettino di Zoologia Agraria e di Bachicoltura* 31(1): 31–35.

[A new record in Italy of the mealybug *Phenacoccus solani* Ferris (Homoptera Coccoidea) on *Encephalartos* sp. (Cycadaceae) in cold greenhouse is reported together with some morphological comments.]

First author's address: Dipartimento di Scienze e Technologie Fitosanitarie, Università di Catania, Via Valdisavoia 5, I-95128, Catania**Italy.

PEREZ-FARRERA, M.A., VOVIDES, A.P. & IGLESIAS, C. 1999. A new species of *Ceratozamia* (Zamiaceae, Cycadales) from Chiapas, Mexico. *Novon* 9(3): 410–413.

[A new species of cycad, *Ceratozamia alvarezii* (Zamiaceae) from Chiapas, is described and illustrated. This species has affinities with *C. matudai* from Chiapas and *C. sabatoii* from Queretaro and Hidalgo. It differs from these species with regard to trunk, leaf habit, and male and female cones. It differs from *C. norstogii*, also from Chiapas, in that the latter is a much larger unbranched plant with a spirally twisting leaf rachis.]

First author's address: Escuela de Biología,

Universidad de Ciencias y Artes del Estado de Chiapas, Calzada Samuel Leon Brindis S/N, Tuxtla Gutierrez, CHIS**Mexico.

POLE, M. & DOUGLAS, B. 1999. Plant macrofossils of the upper Cretaceous Kaitangata Coalfield, New Zealand. *Australian Systematic Botany* 12(3): 331–364.

[Uppermost Cretaceous sediments from the Cretaceous Kaitangata Coal Mine and the Wangaloa coast (south of Dunedin, New Zealand) were investigated for dispersed plant macrofossils. The gymnosperms include two cycads (*Macrozamia* sp. and *Pterostoma* sp.), *Ginkgo* sp., three further possible ginkgophyta taxa, and ten conifer taxa. The conifers include two new conifer genera and species, *Maikuku stephaniae* and *Waro riderensis*, which are placed in the Taxodiaceae s.l., five forms which can be placed into pre-existing genera (*Araucaria* sp., *Otakauia lanceolata*, *Kaia minuta*, *Kakahuia* sp. 'Kai Point', and *Paahake* cf. *P. papillatus*), and three others which are not identified to genus (Araucariaceae gen. indet., cf. *Dacrycarpus*, and 'Wangaloa conifer'). There are also 13 types of angiosperm cuticle, including one in the Lauraceae, and one with affinities to Chloranthaceae and Monimiaceae. Sample heterogeneity as regards taxa present and their abundance suggest taxonomic heterogeneity in the original vegetation.]

First author's address: Department of Botany, University of Queensland, Brisbane, QLD, 4072, Australia.

SAMIGULLIN, T.K., MARTIN, W.F., TROITSKY, A.V. & ANTONOV, A.S. 1999. Molecular data from the chloroplast *rpoCl* gene suggest a deep and distinct dichotomy of contemporary spermatophytes into two monophyla: Gymnosperms (including Gnetales) and angiosperms. *Journal of Molecular Evolution* 49(3): 310–315.

[Partial sequences of the *rpoCl* gene from two species of angiosperms and three species of gymnosperms (8330 base pairs) were determined and compared. The data obtained support the hypothesis that angiosperms and gymnosperms are monophyletic and none of the recent groups of the latter is sister to angiosperms.]

First author's address: A.N. Belozersky Institute of Physicochemical Biology, Moscow State University, Moscow, 11988, Russia.

WINDSOR, D., NESS, J., GOMEZ, L.D. & JOLIVET, P.H. 1999. Species of *Aulacoscelis* Duponchel and Chevrolat (Chrysomelidae) and *Nomotus* Gorham (Languriidae) feed on fronds of Central American cycads. *Coleopterists Bulletin* 53(3): 317–231.

[Observations in Costa Rica and Panama verify a previously hypothesized feeding relationship between the enigmatic chrysomelid subfamily, *Aulacoscelis*, and the "living fossil" Cycadophyta. Large populations of

adult *Aulacoscelis* sp. and *A. costaricensis* Bechyne were observed feeding on *Zamia fairchildiana* Gomez, a cycad native to lower Central America. Feeding was uncharacteristic of Chrysomelidae in that the mandibles were used to pierce the epidermis thereby releasing liquids which alone was ingested. Both species of *Aulacoscelis* Duponchal and Chevrolat also feed opportunistically on fronds damaged by adult Languriidae and larval *Eumaeus goddarti* (Hubner) (Lepidoptera, Lycaenidae) and on *E. goddarti* pupal exudates. Aulacoscelinae and Languriidae feeding was

directed primarily at the first flush of cycad leaves produced at the beginning of the wet season - a pattern of adult beetle activity which collection records and observations indicate is widespread in Mexico and Central America.]

*First author's address: Smithsonian Tropical Research Institute, Balboa-Ancon**Panama.*

Compiled by Nat Grobbelaar, P.O. Box 15357, 0039, Lynn East, South Africa.

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2478	CLARKSON, Dr Keith	Posbus 34281, GLENSTANTIA, 0010
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2477	COETZEE, Mnr R J	Posbus 6610, RUSTENBURG, 0300
1206	COETZEE, Mnr S D	Windmeulstraat 21, BRACKENFELL, 7560
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2267	DE BEER, Mr C M	P O Box 1107, WHITE RIVER, 1240
2494	DE BEER, Wouter & Retha	Franzinastraat 272, ELOFFSDAL, Pretoria, 0084
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0410	DE HAAS, Dr G N	Posbus 1897, PIETERSBURG, 0700
2106	DE JAGER, Mnr A P	Posbus 72513, LYNNWOODRIF, 0040
1675	DE JAGER, Prof F J	R.A.U., Posbus 524, AUCKLANDPARK, 2006
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1962	DE JAGER, Mnr S	Posbus 224, VRYHEID, 3100
0080	DE JONG, J J	P O BOX 934, NORTH RIDING, 2162
2095	DE JONGE, Mr H	P O Box 374, MOOINOOL, 0325
1838	DEKKER, Ds D J M	Posbus 166, DUNDEE, 3000
0664	DE KLERK, Dr J A	Posbus 2234, PIETERSBURG, 0700
2034	DE KLERK, Mr J C	P O Box 90458, GARSFONTEIN X4, 0042
0452	DE KOCK, Mnr C V	Posbus 7222, TZANENG MALL, 0855
0404	DE KOCK, Prof G	Posbus 5836, WALMER, 6065
0815	DE KOCK, Dr J A	Posbus 2498, PIETERSBURG, 0700
1374	DE KOCK, Prof K N	Richardsonstraat 2, Bailliepark, POTCHEFSTROOM, 2520
2383	DE LANGE, Mr Leon S	P O Box 1503, AMANZIMTOTI, 4125
1062	DE LA REY, Mnr A le R	Posbus 1411, LETSITELE, 0885
2288	DELPOR, Mr J L	P O Box 523, DURBANVILLE, 7551
2355	DE MUNNIK, Dr A	Posbus 4816, MIDDELBURG, 1050
2152	DENYER, Mr D C	P O Box 81, FAERIE GLEN, 0043
2017	DE RIDDER, Mr Gerard	P O Box 783148, SANDTON, 2146
1818	DE SMIDT, Mr D J	P O Box 71329, BRYANSTON, 2021
2472	DE VILLIERS, Mnr Tielman	Posbus 73400, LYNNWOODRIF, 0040
2090	DE VRY, Mnr C F P	Posbus 11404, QUEENSWOOD, 0121
0328	DE WET, Daniel S	Primariusstraat 17, STRAND, 7140
1817	DEXTER, Peter	94 Buckingham Road, KLOOF, 3610
2039	DIEDERICKS, Mnr W J	Posbus 17081, GROENKLOOF, 0027
0085	DIXON, Mr Ian	20 Varley Road, Hayfields, PIETERMARITZBURG, 3201
1403	DODDEMEADE, Mr P W	P O Box 59112, KENGRAY, 2100
1649	DOEPEL, Mr W R	P O Box 1127, HONEYDEW, 2040
1464	DONALDSON, Dr J S	NBI, Private Bag X7, CLAREMONT, 7735
2428	DOS SANTOS, Mr M F C	P O Box 261093, EXCOM, 2023
2227	DROTSKY, Mnr S J	Posbus 1202, CARLETONVILLE, 2500
2281	DU BOIS, B	P O Box 95205, WATERKLOOF, 0145, (Pretoria)
0806	DUNCAN, Mrs Lorraine	10 7th Street, Linden, JOHANNESBURG, 2195
SPES	DU PLESSIS, Mej A	Engelbertusstraat 3, Uitbreiding 12, DORANDIA, 0182
1298	DU PLESSIS, Mnr André	Essenhoutweg 9, Wilkoppies, KLERKSDORP, 2570
2459	DU PLESSIS, C & R	40 Richellieu Street, Evergreen, DURBANVILLE, 7550
2419	DU PLESSIS, Mnr J H	Springkaanvoëlstraat 83, JAN NIEMAND PARK, Pretoria, 0186
2377	DU PLESSIS, Mnr Johan P	Posbus 3173, PRETORIA, 0001
2107	DU PLESSIS, Mev I E	Posbus 2064, MIDDELBURG, 1050
2290	DU PLESSIS, Dr J	Wychwoodlaan 31, Linkside, PORT ELIZABETH, 6001
2218	DU PREEZ, Mnr H K	Dikbaslaan 59, WONDERBOOM, 0182

1577 DU PREEZ, Mnr J C
 1854 DU PREEZ, Mnr J G
 2481 DU PREEZ, Mnr L
 1428 DU RAND, Mr L
 1810 DU TOIT, Mnr Biem
 2358 DU TOIT, Mnr C L
 0082 DU TOIT, Mev Erica
 1064 DU TOIT, Mev H J
 1271 DU TOIT, Mnr H X N
 0971 DU TOIT, Mnr K P
 2040 DU TOIT, Mnr P J &
 VAN DER WESTHUIZEN, Mnr P
 2440 DU TOIT, Mnr S P
 1040 EALES, Mr L E
 1630 EKSTEEN, Mnr L J
 2148 ELLIOTT, Mr V
 2011 ELOFF, Mnr Frits
 2460 ENGELBRECHT, Mev A
 2426 ENGELBRECHT, Mev A W
 0817 ERASMUS, Dr C S
 2132 ERASMUS, Mnr H J
 1863 ERASMUS, Mnr P M S J
 2327 ESTERHUIZEN, Jacque
 2252 ESTERHUYSE, Mnr L W
 0793 EVERETT, Mr W A
 2360 EXLEY, Mnr Schalk
 2504 FERREIRA, Mnr M P
 2498 FICKER, Dr A B D
 9015 FLORA CONSERVATION COMMITTEE
 1963 FOKKENS, Mr J F
 1190 FOUCHÉ, Mnr H P J
 2430 FOURIE, Carl
 1901 FOURIE, Mnr G B
 2044 FOURIE, Mnr J J A
 0689 FOURIE, Mnr M J
 0542 FRITZ, Mnr G
 1632 FUGLISTER, Mr F J
 2238 GARRATT, Dr P J V
 0200 GERBER, Mr Harry
 2113 GIELINK, Mr C C
 2108 GIESE, Mr D G
 2496 GIFFORD, Glen Alan
 1841 GITTLESON, Mr G
 1614 GNEITING, Mr C F H
 1466 GOLDSCHMIDT, Dr R P
 0525 GORE, Mnr P H
 2273 GOSSMANN, J F
 1335 GOULD, Mr & Mrs T
 2138 GOUWS, Mnr A R
 2342 GOUWS, Mnr L C
 1789 GREYLING, Mnr J J
 1720 GRIESEL, Mnr C L B
 1400 GROBBELAAR, Mev Hanneke
 0097 GROBBELAAR, Prof N (Erelid)
 2436 GROBLER, Mnr J D H
 0143 GROBLER, Mev Maria
 2285 GROBLER, Mnr Phil
 2502 GROENEWALD, Mnr D M
 2520 GRÖTE, Mrs Patricia
 0420 HANACZECK, Mr H W
 2505 HANS BAHCIC FAMILIE TRUST
 2406 HARRIS, Mrs J B
 1178 HARRIS, Mr M V
 1600 HARRIS, Mnr R
 0296 HARRY MOLTEÑO LIBRARY
 0510 HARRISON, E R
 0601 HART, Mr G B
 2271 HATTINGH, Mev Elza
 2318 HATTINGH, Mnr J F
 1964 HEINE, Mnr E W P
 2437 HEARD, Mr R W
 Posbus 5452, Onverwacht, ELLISRAS, 0557
 Fisserstraat 8, ELSBURG, 1428
 Posbus 2112, LICHTENBURG, 2740
 P O Box 1254, ROOSEVELT PARK, 2129
 Posbus 3942, PIETERSBURG, 0700
 Terblanchstraat 5, De Zoete Inval, SUIDER PAARL, 7646
 Posbus 3922, NELSPRUIT, 1200
 Welgelegen BREDASDORP, 7282
 Posbus 22, BREDASDORP, 7280
 Posbus 75, BURGERSFORT, 1150
 Posbus 2328, KLERKSDORP, 2570
 Posbus 1206, SOUTHDALE, 1206
 263 Lewisham Road, BLACKHEATH, Johannesburg, 2195
 Posbus 4496, EMPANGENI, 3880
 45 Grenville Avenue, SAVOY ESTATE, 2090
 Posbus 12609, CLUBVIEW, 0014
 Posbus 4496, EMPANGENI, 3880
 Posbus 424, GROBLERSDAL, 0470
 77 Rustenburg Road, EMMARENTIA, Johannesburg, 2195
 Posbus 180, DUIWELSKLOOF, 0835
 Posbus 31231, TOTIUSDAL, 0134
 Posbus 11909, ASTON MANOR, 1630
 Balmoral Ave 169, Lisdogan Park, ARCADIA, 0083
 P O Box 238, CONSTANTIA, 7848
 Posbus 1913, RICHARDSBAAI, 3900
 Weirstraat 413, PRETORIA-TUINE, Pretoria, 0082
 Posbus 1986, SOMERSET-WES, 7129
 Botanical Society of SA, Kirstenbosch, CLAREMONT, 7735
 P O Box 14504, NELSPRUIT, 1200
 Posbus 30873, KYALAMI, 1648
 Granietstraat 1, WILKOPPIES, Klerksdorp, 2571
 Posbus 75113, LYNNWOODRIF, 0040
 Posbus 908541, MONTANA, 0151
 Hobsonstraat 9, STILFONTEIN, 2551
 Posbus 139, HEIDELBERG, 2400
 P O Box 121, HALFWAY HOUSE, 1685
 71 Myro Drive, Glenmore, DURBAN, 4001
 45 Anleno Road, Montclair, DURBAN, 4001
 P O Box 3786, DURBAN, 4000
 P O Box 2, GONUBIE, 5256
 P O Box 11310, CENTURION, 0046 / Website www.Lebombo.com
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 31 Sunnyside Road, ORCHARDS, 2192
 P O Box 72188, LYNNWOOD RIDGE, 0040
 P O Box 68332, BRYANSTON, 2021
 669 Killick Avenue, LES MARAIS, Pretoria, 0084
 Sultanastraat, Uitsig, WELLINGTON, 7655
 P O Box 132, PENNINGTON, 4184
 Arcadiastraat 869, ARCADIA, 0083
 Posbus 635, FONTAINBLEAU, 2032
 21ste Laan 760, RIETFONTEIN, 0084
 Queens Crescent 427, LYNNWOOD, Pretoria, 0081
 Tarentaalkloof, Posbus 15357, LYNN-OOS, 0039
 Tarentaalkloof, Posbus 15357, LYNN-OOS, 0039
 Posbus 20116, PROTEA PARK, 0305
 Posbus 914, PIETERSGURG, 0700
 Posbus 236, PIETERSBURG, 0700
 Willsonstraat 161, FAIRLAND, 2195
 P O Box 24, GREYMONT, 2035
 P O Box 44, DUIWELSKLOOF, 0835
 P O Box 76, HEILBRON, 9650
 P O Box 1765, NEW GERMANY, 3620
 64 Robertson Road, WARMBARTHS, 0480
 Posbus 16514, VERWOERDBURG, 0140
 The Librarian, Kirstenbosch, Private Bag X7, CLAREMONT, 7735
 P O Box 104, MTUBATUBA, 3935
 P O Box 72727, LYNNWOOD RIDGE, 0040
 Posbus 797, HONEYDEW, 2040
 Posbus 13717, SINOVILLE, 0129
 Groeneweide 10, STELLENBOSCH, 7600
 P O Box 6059, DUNSWART, 1508

2326	HELM, Marius	Posbus 9612, QUEENSTOWN, 5320
0115	HENMAN, Mr Enrico	12 Dhlinsa Street, ESHOWE, 3815
2096	HENNING, Dr J C	Posbus 1168, ELLISRAS, 0555
0433	HENNING, Dr N G C	Cantonmentsweg 80, LYTTELTON MANOR, Centurion, 0157
1080	HEYNS, Mnr J O	Wenningsstraat 115, GROENKLOOF, Pretoria, 0181
2006	HOBBS, Mnr E T	Bosveldweg 157, WONDERBOOM, 0182
1711	HOLLANDER, Prof W J	RAU, Posbus 524, AUCKLANDPARK, 2006
2063	HOOFDIREKTORAAT NATUURBEWARING	Privaatsak X209, PRETORIA, 0001
1794	HOOG, Mr RJL	22 Douglas Road, KLOOF, 3610
0086	HOOLE, Mr James	P O Box 7958, NEWTON PARK, Port Elizabeth, 6055
1946	HÖRING, Mr H J	12 Leeuwenhof Street, OAK GLEN, Belville, 7530
0295	HORNE, Mnr C	Kommandeurstraat 51, WELGEMOED, Belville, 7530
1983	HORSTEMKE, Mr R E	P O Box 365, FERNDALE, 2160
2236	HOWES, Cobie & Julie	55 Homestead Avenue, HILLCREST, 3610
0498	HULSHOF, Mr A	P O Box 1526, KLERKSDORP, 2570
1766	HUNTER, Dr J J	Nietvoorbij, Privaatsak X5026, STELLENBOSCH, 7599
1155	ISACKS, Mr G A	8 Medway Road, WESTVILLE, 3630
1168	ISACKS, Mr G R	44 Windham Avenue, HILLARY, 4094
2490	JACOBS, W J	Justinalaan 8, LA LUCIA, Durban, 4051
2178	JANSEN, Mnr Zandberg	Roosweg 8, DAWNVIEW, Germiston, 1401
2448	JANSE VAN RENSBURG, Mr J B	3 Gen E R Snyman Close, WELGELEGEN, 7500
1002	JANSE VAN RENSBURG, Mnr J M	Posbus 92, VRYHEID, 3100
1217	JANSE VAN RENSBURG, Mnr J P	Jopie Fouriestraat 374, PRETORIA-NOORD, 0182
2248	JANSE VAN RENSBURG, Mev M M	Hendrik Boomstraat 18, Van Riebeeckpark, WORCESTER, 6850
0458	JOHANNES, Mr G	P O Box 215, PIET RETIEF, 2380
0644	JOHANNES, Mr H C	P O Box 276, PAULPIETERSBURG, 3180
2501	JOHANNESBURG BOTANIC GARDEN FOUNDATION	P O Box 85481, EMMARENTIA, 2029
1797	JOHANNESBURG PUBLIC LIBRARY	Market Square, JOHANNESBURG, 2001
2350	JORDAAN, Mev A M	Posbus 1059, HEIDELBERG, 2400
1527	JORDAAN, Past Ben	P O Box 55884, PIETERSBURG, 0700
2076	JORDAAN, Dr J B	Posbus 19166, NELSPRUIT, 1200
0146	JORDAAN, Sakkie & Anna	Posbus 104, WARRENTON, 6530
2292	JOUBERT, J J	Posbus 21991, Helderkruin, ROODEPOORT, 1730
1355	JOUBERT, Mnr W	Posbus 376, WARMBAD, 0480
1462	KABLE, Mr A J	12 Orchid Road, TYGERDAL, Goodwood, 7460
0223	KACHELHOFFER, Mr N J	P O Box 2062, BROOKLYN SQUARE, 0075
1791	KADWA, Dr M A	Plastic Surgeon, Parklane Clinic, Private Bag X40500, HOUGHTON, 2041
2270	KANONBERG BOERDERY	Posbus 2634, DURBANVILLE, 7551
0010	KEMP, Mr H J	51 Constance Road, Broadwood, PORT ELIZABETH, 6070
1989	KEMPKES, Mr I	P O Box 1850, VEREENIGING, 1930
2151	KENDALL, L	P O Box 11324, HATFIELD, 0028
0081	KENNEDY, Mnr H C	Blok A-E 17, Huis Vergenoegd, Hoofstraat 188, PAARL, 7646
2442	KILIAN, D R	P O Box 43150, THERESA PARK, Pretoria North, 0155
2518	KLEINHANS, Mnr T E	Posbus 18452, PRETORIA-NOORD, 0116
2394	KLEYNHANS, Mnr P A	Dirk Van Deventerlaan 122, WONDERBOOM, 0182
0745	KLOPPERS, Mnr John S	Posbus 24, GROBLERSDAL, 0470
1867	KOCKOTT, Mrs C P	P O Box 787002, SANDTON, 2146
1358	KOFMAN Mnr J H	Posbus 1106, Montana Park, PRETORIA, 0159
1871	KONIG, Mr Andrew	P O Box 475, BUCCLEUCH, 2066
1939	KORKIE, Mnr E S	Vampirestraat 569, ELARDUSPARK, 0181
2192	KRIEL, Mnr Henri-Jacques	Posbus 130, FLORIDA, 1710
1812	KRIEL, Mnr W J	Rupertlaan 34, SOMERSET-WES, 7130
1302	KRUGER, Mrs F J	22 Approach Avenue, Selwyn, FLORIDA, 1709
2286	KRUGER, H C	P O Box 1061, HERMANUS, 7200
2469	KRUGER, H J	Posbus 241, NYLSTROOM, 0510
2311	KRUGER, Mnr Johan	Posbus 911343, ROSSLYN, 0200
1373	KRUGER, Mnr N J S	Posbus 46, RANT-EN-DAL, 1751
0853	KRUGER, Dr P W B	Posbus 3173, PRETORIA, 0001
1140	KRUGER, Mnr S R	Reineckestraat 45, Panorama, BETHLEHEM, 9700
2423	KRUSE, Pieter	Jacobsstraat 636, RIETFontein, 0084
1672	KUSCHKE, Mnr A E	Posbus 54, HAZYVIEW, 1242
1832	KUUN, Mnr P J C	Posbus 39718, MORELETAPARK, 0044
2475	LABUSCHAGNE, D L	Posbus 174, HEILBRON, 9650
2420	LAMBRECHTS, Dr A H D	Amandelweg 51, AMANDA GLEN, Durbanville, 7550
2343	LAMBSON, Mr B	P O Box 411521, CRAIGHALL, 2024
2418	LAVIS, Mr A	15 Flamboyant Street, NORTHMEAD EXT 4, Benoni, 1501
1679	LEACH, Mev Marie	Kingfisherstraat 124, Horizon Uitbreiding 1, ROODEPOORT, 1725
2114	LEEB, Mnr G A R	Posbus 1275, TZANEEN, 0850
2392	LEMMENS, Mr D R	P O Box 15285, LAMBTON, 1414
1532	LESSING, Mnr & Mev J	Oribistraat 30, JEFFREYSBAAI, 6330

1166	LIGHTLEY, Mr C G	P O Box 11619, EMPANGENI, 3880
1948	LOMBAARD, Mnr J A	Posbus 50689, WIERDAPARK, 0149
2228	LOOTS, Hein	Posbus 2057, VRYHEID, 3100
2133	LÖTTER, Mnr L J	Posbus 2442, VRYHEID, 3100
0645	LOTTER, Mnr W J	Posbus 48520, Hercules, PRETORIA, 0030
0159	LOUBSER, Prof J D	Posbus 11315, QUEENSWOOD, 0121
2219	LOURENS, Mnr A J	Posbus 9455, ELSBURG, 1407
2493	LOURENS, Mnr J A G	Posbus 363, PONGOLA, 3170
2491	LOURENS, Mev S	Posbus 68, PONGOLA, 3170
2310	LOUW, Mev E	Posbus 832, OTJIWARONGO, NAMIBIË
1676	LOUW, Mr J P	P O Box 21433, VALHALLA, 0137
1272	LOUW, Mnr W H	Posbus 2860, BRITS, 0250
1324	LOVATT, Mr M	P O Box 338, EMPANGENI, 3880
2209	LOVE, Mr C F M	P O Box 2690, DURBAN, 4000
2083	LUCAS, Mr S C	P O Box 22882, HELDERKRUIN, 1733
2487	LUDWICH'S LANDSCAPES & WATER FEATURES	P O Box 739, PAULSHOF, 2056
2069	MANGA, Mr Vasan	P O Box 1536, BENONI, 1500
0561	MARAIS, Mnr A J	Posbus 28006, SUNRIDGEPARK, 6008
2376	MARAIS, Dr D D	Posbus 13948, HATFIELD, Pretoria, 0028
1973	MARAIS, Mr R E B	67 Glover Avenue, DORINGKLOOF, 0157
2473	MARAIS, Mnr Thys	Posbus 103, PONGOLA, 3170
2425	MARITZ, Mnr Faan	Posbus 60539, VAALPARK, 9573
2203	MARITZ, Mnr H P	Posbus 39156, GARSFONTEIN-OOS, 0060, Pretoria
2274	MARTEN, Mr M	32 A G Visser Street, Brackenhurst, ALBERTON, 1450
2255	MASSYN, Mnr C	George Anton Park 29, George Antonstraat, ANNLIN, 0182
2427	MATTHEUS, Adolf	Posbus 41034, MORELETARIF, 0044
1805	MAUD, Mr C J	1 Howard Place, DURBAN NORTH, 4051
2142	McBEAN, Mr W	8 Louw Avenue, MONUMENT, 1739
2411	McINTOSH, Dr R R	Privaatsak X9474, PIETERSBURG, 0700
2324	McKINLAY, Mr D F	P O Box 31388, WONDERBOOMPOORT, Pretoria, 0033
2280	MEIRING, Mnr R B	Posbus 438, KLAPMUTS, 7625
1701	MENTZ VAN ZYL, M H	P O Box 600, RAMSGATE, 4285
1667	MERESMAN, Ms Avis	P O Box 45, UMLAAS ROAD, 3730
0205	MEYER, Mnr C C	Ralstonweg 20, FERNGLEN, PORT ELIZABETH, 6045
2351	MEYER, Mnr Danie	Posbus 12116, ELSPARK, 1418
1575	MEYER, Prof J J M	Dept Plantkunde, Universiteit van Pretoria, PRETORIA, 0002
1109	MEYER, Mr P K	P O Box 435, ST MICHAEL'S-ON-SEA, 4265
1107	MIDDELMANN, Mr W J W	402 CPOA, 231 Main Road, RONDEBOSCH, 7700
2048	MILLAR, Mrs R E	P O Box 49300, ROSETTENVILLE, 2130
2150	MINNAAR, Mnr & Mev D	Posbus 95597, WATERKLOOF, 0145
0006	MINNIE, Dr Ollie J	P O Box 137, MTUBATUBA, 3935
2199	MONTEIRO, A M	P O Box 85, KNIGHTS, 1413
1210	MOODIE, Mnr S T	Posbus 72215, LYNNWOODRIF, 0040
2488	MORRICK, Mnr G	Posbus 25144, MONUMENTPARK, Pretoria, 0105
2375	MORRISON, Bruce	P O Box 1233, SPRINGS, 1560
1957	MOSTERT, Mev Cassandra	Posbus 687, KEMPTONPARK, 1620
2086	MOSTERT, Mnr P J	Main Road 353, ESCOMBE, Queensburgh, 4093
0741	MULDER, Mnr I B	Saffraanlaan 10, Weltevredenpark X9, ROODEPOORT, 1709
2230	MULDER, Theuns	Ashstraat 3, VANDERBIJLPARK, 1911
1965	MULDER, Mnr H F	Kahlerstraat 64, Idasvallei, STELLENBOSCH, 7600
1798	MÜLLER, Mnr E	Posbus 17360, PRETORIA-NOORD, 0116
1722	MULLER, Mnr T I	Posbus 11074, UNIVERSITAS Bloemfontein, 9321
1922	MYBURGH, Mnr & Mev F M	Posbus 268, KAREEDOUW, 6400
2304	MYBURGH, Dr Jan G	Victorstraat 43, MURRAYFIELD, Pretoria, 0184
2170	MYBURGH, Mnr J L	Posbus 6455, ONVERWACHT, Ellisras, 0557
0397	MYBURGH, Mej J S	Departement Plantkunde, Universiteit van Pretoria, PRETORIA, 0002
0523	MYBURGH, Mnr P P	Associationweg 9, Dawnview, GERMISTON, 1401
1620	MYERS, Mev M M	Posbus 401, WITRIVIER, 1240
9011	NATAL HERBARIUM	The Curator, Botanic Gardens Road, DURBAN, 4001
9001	NATAL PARKS BOARD	The Director (Att Mr R Scott-Shaw), P O Box 662, PIETERMARITZBURG, 3200
9016	NATALSE BIBLIOTEEK	Die Bibliotekaris, (Afd Pligeksemplare), Posbus 415, PIETERMARITZBURG, 3200
2191	NATIONAL BOTANICAL GARDEN NELSPRUIT	The Library, P O Box 1024, NELSPRUIT, 1200
0065	NATIONAL BOTANICAL INSTITUTE	Kirstenbosch Horts, Private Bag X7, CLAREMONT, 7735
1232	NATIONAL BOTANICAL INSTITUTE	The Librarian, Private Bag X101, Pretoria, 0001
1865	NATIONAL BOTANICAL INSTITUTE	The Nursery, Private Bag X101, PRETORIA, 0001
9018	NATUURBEWARING NOORDELIKE PROVINSIE	(Riaan de Jager), Posbus 494, PIETERSBURG, 0700
0993	NAUDE, Mnr A S B	Posbus 6895, Kanonkop, MIDDELBURG, 1050

1570	NAUDE, Mnr J J	Posbus 157, TZANEEN, 0850
2220	NAUDE, Mnr L J	Durbanweg 90, MOWBRAY, Kaapstad, 7700
0261	NEL, Danie & Avis	P O Box 45, UMLAAS ROAD, 3730
2296	NEL, Dr E U	Posbus 11538, ERASMUSKLOOF, Pretoria, 0048
1423	NEL, Mnr J J G	Jan van Riebeeckweg 300, OUDSHOORN, 6620
1784	NEL, Mnr P W	Posbus 122, NABOOMSPRUIT, 0560
0227	NEL, Mnr William	Posbus 87, MTUNZINI, 3867
2124	NELL, Dr Johan	Posbus 2787, RANDBURG, 2125
1943	NELL, Mnr J F	Hexrivierstraat 40, Eastvale, SPRINGS, 1560
0237	NELL, Mnr J M	Danielstraat 60, Lambton Gardens, GERMISTON, 1428
2452	NELSON, Mr S C	P O Box 614, BELLVILLE, 7535
1346	NEWLAND-NELL, Mr T	9 Perth Street, Kabega Park, PORT ELIZABETH, 6025
1194	NIEMAND, Mr & Mrs H & D	50 Judges Avenue, Cresta Extention 1, RANDBURG, 2194
2346	NIENABER, Mev H J	Posbus 20045, RICHARDSBAAI, 3900
1192	NIEUWENHUIZEN, Mr R	P O Box 2086, DURBANVILLE, 7551
1503	NIEUWOUDT, J & L	P O Box 292, SKEERPOORT, N W Province, 0232
0829	NIEUWOUDT, Prof C F	Posbus 17129, GROENKLOOF, 0027
2294	NORMAN, Tyrone & Sue	P O Box 3315, Cluster No 1, SUNNINGDALE, 4051
1869	OBERHOLZER, Mr N S	61 17th Street, PARKHURST, 2193
1968	OBERHOLZER, Niel & Thea	Posbus 44622, LINDEN, 2104
1588	OCHSE, Mr A L	P O Box 310, HONEYDEW, 2040
0094	OLIVIER, Mnr L	Posbus 288, KIRKWOOD, 6120
2356	O'NIELL, Miss F M M	29 Wellington Street, IRENE, 0062
0872	OOSTHUYZEN, Mnr J C	Posbus 59911, KARENPAK, 0118
2446	OSMERS, Mev Rita	Posbus 102, TZANEEN, 0850
2257	PAGE, Mnr & Mev C & A	Posbus 32167, GLENSTANTIA, 0010
2215	PARKER, Mr K	Sydneys Hope, Po SIDBURY, 6131
0357	PARSONS, Mr J S	P O Box 41652, CRAIGHALL, 2024
2300	PAUTZ, Mr M J	Cycads for Africa, P O Box 209, KNYSNA, 6570
2244	PAUW, Dr J C	Posbus 461, PAARL, 7464
0059	PHIPSON, Mrs Y H	3 Dickens Pice, PINETOWN, 3610
0024	PIENAAR, Mr Leon	626 Jan Visse Avenue, ROSEVILLE, 0084
2207	PIENAAR, Mnr M G	Posbus 1300, NELSPRUIT, 1200
2287	PIENAAR, Mnr W J	Posbus 2169, MONTANAPARK, 0159
1323	PIETERSE, Mnr F P	Emus Erasmuslaan 278, ERASMUSRAND, Pretoria, 0181
1354	PILLAI, Mr L	55 Maple Crescent, Circle Park, KLOOF, 3610
0078	PINKER, Mr Colin	P O Box 2115, NELSPRUIT, 1200
1941	POTGIETER, Dr Chris	Posbus 12, HUMANSDORP, 6300
2513	POTTER, Neil	P O Box 816, STUTTERHEIM, 4930
1152	POULTON LIBRARY	Durban Parks Department, P O Box 3740, DURBAN, 4000
2185	POWELL, J B	Dowlingweg 2, Warner Beach, KINGSBURGH, 4126
0864	PRANGLEY, Mr P R	P O Box 35245, NORTHWAY, 4065
1843	PRETORIUS, Mnr & Mev J	Posbus 327, LEVUBU, 0929
2409	PRETORIUS, Mnr J J	Posbus 12002, LERAATSFONTEIN, 1038
2445	PRETORIUS, Dr J P	Gardeniastraat 84, LYNNWOODRIF, Pretoria, 0081
0166	PRINSLOO, Dr G C	Posbus 523, KROONDAL, 0350
1581	PRINSLOO, Mnr J J	Posbus 25219, MONUMENTPARK, 0105
2443	PRITCHARD, Mr T	306 Delphinus Street, WATERKLOOF RIDGE, 0181
0631	PROZESKY, Mr J G	P O Box 6172, BIRCHLEIGH, 1621
2421	PULLEN, Ida S E	22A Maple Road, MORNINGSIDE, Durban, 4001
2395	PURDON, Mrs C J	P O Box 815, PHALABORWA, 1390
1917	QUINN, Peter & Linda	P O Box 77, DURBAN, 4000
2439	RADLEY, Mnr & Mev B	Posbus 1838, FLORIDA HILLS, 1716
1112	RAUTENBACH, Mnr M J	Irving Steynstraat 19, South Crest, ALBERTON, 1449
2413	RAWLINS, Mr Greg K	7 Scouts Place, PINELANDS, Cape Town, 7405
1197	REINACH, Dr Norman	Posbus 1834, GEORGE, 6530
0759	RIDGE, Mr Bruce	22 EstuaryView, Beacon Bay, EAST LONDON, 5241
1222	RIORDAN, Mr S	CRM City Branch 4 South, P O Box 61689, MARSHALLTOWN, 2107
1654	ROBBERTSE, Prof P J	Astridstraat 167, MEYERSPARK, Pretoria, 0184
1253	ROBINSON, Mr Ken	P O Box 41168, CRAIGHALL, 2024
1699	ROOS, Mr C A	P O Box 7186, ALBEMARLE, 1410
2005	ROOS, Mnr P B	Posbus 1949, NABOOMSPRUIT, 0560
2175	ROSENDAL, Mr S	29 Bamboes Street, KILNER PARK, 0186
0187	ROSS, Mr W D	20 Wanless Road, Glenmore, DURBAN, 4001
0973	ROSSOUW, Mr N B	P O Box 39419, QUEENSBURGH, 4070
2171	ROUSSEAU, Mnr Robert	Posbus 32416, GLENSTANTIA, 0010
1853	ROUWENHORST, Erik	Posbus 620, NEWCASTLE, 2940
1442	ROUX, Mnr J J	Graphitestraat 64, WILROPARK, Roodepoort, 1724
0415	RUDMAN, Mr R R	3 Dunn Road, Jansendal Township, UITENHAGE, 6229
1829	SCHAAP, Mnr S	Posbus 149, GRAVELOTTE, 0895
2301	SCHELHASE, Fred	Posbus 61596, PIERRE VAN RYNEVELD, 0045
0311	SCHIMMER, Mr C M	P O Box 274, ALLANRIDGE, 9490

1984	SCHMIDT, Mr E V	4 Lauriston Lanes, 55 Viking Road, GLEN LAURISTON, 0185
2410	SCHNETLER, Mnr André M	Posbus 1916, WITBANK, 1035
1881	SCHOEMAN, Mnr J	Posbus 38448, GARSFONTEIN, 0042
2204	SCHOEMAN, Mnr M D	Posbus 409, MONTANA, 0151
2506	SCHOLTZ, Mnr J A	Posbus 3955, WITRIVIER, 1240
2283	SCHUTTE, Mr H P	P O Box 12596, JACOBS, Durban, 4026
1880	SCHUTTE, Mev J E	Posbus 146, VILJOENSKROON, 9520
2202	SCHUTTE, Mnr M	Buhrmannstraat 30, Horison, ROODEPOORT, 1724
1077	SCHUTTE, Dr R L	P O Box 650580, BENMORE, 2010
0647	SCHWELLNUS, Mnr M R	Posbus 7045, Newton Park, PORT ELIZABETH, 6055
2000	SCOTT, Mr J J	17 Slangkop Avenue, Rand Park Ext 4, RANDBURG, 2195
0477	SCRIBA, Mr J H	P O Box 1708, GEORGE, 6530
2186	SCRIBANTE, Mnr J C E	Christolaan 5, Birchleigh, KEMPTON PARK, 1618
2407	SRIBANTE-LEANDRO, Mr L F	101 Haygarth Road, KLOOF, 3610
1249	SEEDAT, Hassim	P O Box 48611, QUALBERT, 4078
2256	SIM, Mnr Henry	Posbus 239, KROONSTAD, 9500
0254	SLABBERT, Mnr J F	Diazweg 122, Adcockvale, PORT ELIZABETH, 6001
1650	SLAVIERO, Mr L	2 Pierneef Road, Elma Park, EDENVALE, 1610
2479	SMAL, Mr D A	69 Christopherson Road, DUNNOTTAR, 1496
1959	SMALBERGER, Mnr H C	Posbus 17190, PRETORIA-NOORD, 0116
2399	SMIT, Mnr C A	Posbus 48114, HERCULES, Pretoria, 0030
0534	SMIT, Mnr D D	Posbus 11126, HATFIELD, 0028
2454	SMIT, Mnr Marius	Zevenwacht Plaasdoorp 57, Posbus 609, KUILSRIVIER, 7579
0903	SMITH, Prof G F	NBI, Privaatsak X101, PRETORIA, 0001
2462	SMITH, Mnr J	Posbus 1449, DUNDEE, 3000
1356	SMITH, Mr J D	P O Box 210, WINKELSPRUIT, 4145
2402	SMITH, Mr J H	Private Bag X620, PRETORIA, 0001
2116	SMITH, Mr M R	P O Box 164, BROEDERSTROOM, 0240
1830	SMITH, Mr T D	6 Uve Road, KLOOF, 3610
2378	SMOOK, Dr Gustav J	Posbus 12801, HATFIELD, 0028
2403	SMUTS, Mnr L S	Kamferbosstraat 6, KILNERPARK, 0186
0698	SMUTS, Mnr M N	Posbus 13682, SINOVILLE, 0129
2120	SNYMAN, Mnr A D	Posbus 520, UTRECHT, 2980
1481	SNYMAN, Mr A J	P O Box 5450, Panorama Park, WINKELSPRUIT, 4145
1815	SNYMAN, Dr P H R	Posbus 565, MONTANAPARK, 0159
2391	SNYMAN, Mnr S	Posbus 434, MAGALIESKRUIN, Pretoria, 0150
2249	SOLE, Terry	P O Box 634, EDENVALE, 1610
2401	SOPP, Willie	Posbus 758, MALELANE, 1320
2374	SPICER, Mr Andrew J P	P O Box 1927, JUJSKEI PARK, 2153
0992	SPICER, Mr B E J	23 West Riding Road, HILLCREST, 3610
9003	STAATSBIBLIOTEEK	Die Direkteur, (Afd Pligeksemplare), Posbus 397, PRETORIA, 0001
2510	STADLER, Mev N	Posbus 1627, NOORDHEUWEL UIT 3, 1756
2456	STANDER, Dr H F M	Posbus 17238, PRETORIA NOORD, 0116
2349	STAUDE, Mr H S	P O Box 398, MAGALIESBURG, 2805
2503	STANTON, Mr J H	P O Box 977, HONEYDEW, 2040
2508	STEENKAMP, Mnr Gawie	Posbus 336, MOOINOOI, 0325
2381	STEENKAMP, Dr Gerhard	Posbus 42144, MORELETAPARK, 0044
2331	STEENKAMP, Mnr J H	Posbus 34, BRITS, 0250
0911	STEENKAMP, Mnr & Mev K	Posbus 218, LOUWSBURG, 3150
2205	STEENKAMP, Mnr P & W	Posbus 17257, GROENKLOOF, 0027
1576	STEP, Mnr E O	Van Riebeecklaan 133, LYTTTELTON MANOR, Centurion, 0157
2279	STEVENS, Mr J S	P O Box 121, SKUKUZA, 1350
1110	STEYN, Glen	P O Box 5125, PIETERSBURG-NORTH, 0750
1236	STEYN, Mr R C	P O Box 1218, HONEYDEW, 2040
2464	STOFBERG, Mnr P	Posbus 99812, GARSFONTEIN OOS, Pretoria, 0060
2484	STOLTZ, Danie	Hoof Tegniese Dienste, Thabazimbi Stadsraad, Posbus 90, Thabazimbi, 0380
2254	STOLZ, A H G	Moultonlaan 1176, WAVERLEY, Pretoria, 0186
1004	STRANEX, Mr Phillip	P O Box 53235, KENILWORTH, 7745
1117	STRANG, Mrs C	P O Box 69212, BRYANSTON, 2021
2341	STROBOS, Mev J M L	Posbus 1732, LINK HILLS, 3652
2384	STRONACH, Mr Laurie	P O Box 644, GRAAFF-REINET, 6280
2210	STRUYF, Mnr Wim	Posbus 1954, NELSPRUIT, 1200
0213	STRYDOM, Dr Dawid	32 Louie Avenue, NORTHCLIFF, 2195
9006	SUID-AFRIKAANSE BIBLIOTEEK	Die Direkteur, (Afd Pligeksemplare), Posbus 496, KAAPSTAD, 8000
2422	SWANEPOEL, Andy & Elize	Bezuidenhoutstraat 9, GLEN MARAIS, Kempton Park, 1619
2515	SWANEPOEL, Gideon & Elsa	Posbus 87, PATERSON, 6130
0139	SWANEPOEL, Mnr Johan	Posbus 911, BLOEMFONTEIN, 9300
1879	SWANEPOEL, Mnr Louis	Posbus 6093, BIRCHLEIGH, 1620
1890	SWART, Dr I J	Posbus 1006, WITRIVIER, 1240
0651	SWART, Mnr M L	Privaatsak X9906, WITRIVIER, 1240
2444	SWART, L M	11de Laan 814, WONDERBOOM-SUID, Pretoria, 0084
0265	TARR, Dr A A	14 St Matthews Road, EAST LONDON, 5201

0147	TATE, Mr D M	P O Box 8099, DIE HEUWEL, 1042
1708	TERBLANCHE, Prof J	Mimosalaan 448, LYNNWOOD, 0081
()	THERON, Prof G K	Posbus 1790, GROENKLOOF, 0027
2514	THERON, Laura	Posbus 551, POTGIETERSRUS, 0600
2078	THEUNISSEN, Mnr P	Posbus 244, HECTORSPRUIT, 1330
2246	THORPE, Mr Robin P	P O Box 1797, MOUNT EDGECOMBE, 4300
0304	TOPHAM, Mr André	P O Box 44, HOEDSPRUIT, 1380
0178	TOPHAM, Mnr C W	Apiesdoringlaan 88, Wonderboom, PRETORIA, 0182
2058	TOWNSEND, Mrs F A	8 Spray Street, Farrarmore, BENONI, 1500
1981	TROLLIP, Mr S W K	P O Box 3622, BRITS, 0250
2237	UDEMANS, Mr Willie L	P O Box 90711, BERTSHAM, Johannesburg, 2013
1599	ULRICH, Mnr B J	Posbus 1956, LADYSMITH, 3370
0678	UNGERER, Mr H	P O Box 279, MELVILLE, 2109
1760	UYS, Mev A G	Posbus 2399, PANORAMA LANDGOED, 1718
0322	VALLABH, Mr P D	373 Mink Street, Laudium, PRETORIA, 0037
2134	VAN DAM, Mev H C	Posbus 8496, NEWCASTLE, 2940
2451	VAN DEN BERG, Mnr D S	Vavell Gardens 10, Cavell Place, SARNIA, 3610
1526	VAN DEN BERG, Mnr I J	Williamsstraat 59, Wilkoppies, KLERKSDORP, 2571
1836	VAN DEN BERG, Mnr T	Posbus 477, MESSINA, 0900
1144	VAN DEN HEEDE, Mr A M P	P O Box 2031, PINETOWN, 3600
1283	VAN DER MERWE, Mnr C H	Posbus 993, Rant-en-Dal, KRUGERSDORP, 1751
1918	VAN DER MERWE, Mnr F A	Posbus 679, BARBERTON, 1300
0136	VAN DER MERWE, Mnr J F	Jack's Cycads, Posbus 39, DUIWELSKLOOF, 0835
0490	VAN DER MERWE, Mnr W D	Posbus 686, PIETERSBURG, 0700
1745	VAN DER MERWE, Mr W S	P O Box 13655, SINOVILLE, 0129
2181	VAN DER WALT, Mnr A J (Snr)	Blackberry 85, ZWARTKOPS X4, Centurion, 0157
2140	VAN DER WALT, Mnr A J	Posbus 39, ELLISRAS, 0555
0203	VAN DER WALT, Mnr A S J	Posbus 77720, Fontainebleau, RANDBURG, 2032
2400	VAN DER WALT, D J A	Posbus 105, MALELANE, 1320
0038	VAN DER WALT, Mev Ita	Cycad Kwekery, Posbus 15251, LYNN-OOS, 0039
2453	VAN DER WALT, Mnr J J	Theunsweg 225, MURRAYFIELD X1, Pretoria, 0184
2284	VAN DER WALT, W H	P O Box 59112, KENGRAY, 2100
2127	VAN DER WESTHUIZEN, Mnr M G	Posbus 424, MAGALIESKRUIN, 0150
1728	VAN DEVENTER, J C	Posbus 10274, WELGEDACHT, 7530
2472	VAN EEDEN, Mnr B W	Posbus 3489, TYGERPARK, 7536
1987	VAN ELST, Mr Deon	P O Box 89201, LYNDHURST, 2106
2297	VAN GEEMS, Mnr J J	Walnutstraat 26, KUILSRIVIER, 7580
2010	VAN HEERDEN, Mnr F J	Posbus 90678, MAGALIESKRUIN, Pretoria, 0150
1185	VAN HEERDEN, Dr H G	P O Box 237, STRAND, 7140
0938	VAN HEERDEN, J L	Undine 2, Eversdal, DURBANVILLE, 7550
2105	VAN JAARVELD, Dr W J	Posbus 28283, DANHOF, 9310
2519	VAN NIEKERK, Mr Andrew	82 Glen Avenue, HIGHWAY GARDENS, Edenvale, 1609
2070	VAN NIEKERK, Dr A R	Posbus 252, SOUTHBROOM, 4277
2272	VAN NIEKERK, Mev Cecilia	Posbus 262, IRENE, 1675
2397	VAN NIEKERK, Mnr G A	Posbus 32, UMBOGINTWINI, 4120
2329	VAN NOORD, A A	140 Senior Drive, NORTHCLIFF, 2195
2213	VAN ONSELEN, Mnr R L	Posbus 82680, DOORNPOORT, Pretoria, 0017
2293	VAN RENSBURG, Mnr Johannes	Posbus 3270, DAINFERN, 2055
2240	VAN RENSBURG, Mr P F J	54 Kosmos Avenue, WILRO PARK, 1724
1258	VAN ROOY, Mnr Leon	Posbus 1019, WITRIVIER, 1240
2470	VAN ROOYEN, Mnr A L	Posbus 1795, VRYHEID, 3100
1924	VAN ROOYEN, Mnr H C	Posbus 2690, WELKOM, 9460
1903	VAN ROOYEN, Prof H G	Dept Kurrikulumstudies, R.A.U., Posbus 524, AUCKLANDPARK, 2006
1925	VAN ROOYEN, Ds J C	Posbus 2752, MIDDELBURG, 1050
0060	VAN ROOYEN, Dr & Mev R A	Posbus 646, WITRIVIER, 1240
2492	VAN SITTERT, Mev E J	Posbus 11, PONGOLA, 3170
2332	VAN VUUREN, Mnr Henco	Posbus 11954, ERASMUSKLOOF, 0048
1819	VAN VUUREN, Mr J A	P O Box 13474, CLUBVIEW, 0014
0229	VAN WYK, Mev G	Posbus 11306, HATFIELD, 0028
1267	VAN WYK, Mnr P L	Stasiestraat 658, PRETORIA-NOORD, 0182
1891	VAN WYK, Mnr R J	Posbus 113, MOOINOOI, 0325
2516	VAN ZIJL, Mnr Eugene	Posbus 11888, HATFIELD, 0028
1756	VAN ZYL, Elkie	Posbus 115, MOOKETSI, 0825
0910	VAN ZYL, Mr J H	P O Box 1822, BROOKLYN SQUARE, 0075
2060	VELDKAMP, Mnr J A	Jim Versterlaan 42, PIERRE VAN RYNEVELDPARK, Centurion, 0157
0681	VENTER, Mnr F F C	Ontdekkersweg 367, Florida Park, Uitbr 3, FLORIDA, 1709
2320	VENTER, Mev Marlene	Posbus 854, PHALABORWA, 1390
2466	VENTER, Mnr M M	Avrilstraat 643, ELOFFSDAL, Pretoria, 0084
2057	VERMAAK, Mnr E de J	Perskeblomweg 9, Pelissier, BLOEMFONTEIN, 9301
2364	VERWEY, Peet & Mina	Posbus 1382, HAZYVIEW, 1242
1033	VICE, Dr A R	26 Beaty Road, SELBORNE, East London, 5201
1945	VILJOEN, Mr Frank	P O Box 261, FERNDAL, 2160

1825	VILJOEN, Mnr G T R	Tugelaweg 1, DUNDEE, 3000
1607	VILJOEN, Mnr Jaap	Posbus 1735, MULBARTON, 2059
2393	VILJOEN, Mnr J A	Flamboyantweg 12, Whitfieldpark, KINGSBURGH, 4126
2123	VILJOEN, Mnr J H	Minervastraat 8, Amanda Glen, DURBANVILLE, 7550
1949	VILJOEN, Mr Norman	28 Cheviot Road, THE HILL, Johannesburg, 2197
0071	VISSER, Mnr Ben	Posbus 3538, BRITS, 0250
2013	VISSER, Mr George	39 Rouxton Road, LANSLOWNE, 7780
1770	VISSER, Mnr W P	Windhoekweg 2, Arauna, BRACKENFELL, 7560
0917	VORAJEE, Mr R	P O Box 222, LADYSMITH, 3370
0016	VORSTER, Dr Piet	Dept Plantkunde, Universiteit van Stellenbosch, Privaatsak X1, MATIELAND, 7602
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2119	WEBB, Mr A R F	25 Anemone Road, PRIMROSE, 1401
2172	WELKEN, Mnr Pieter A (Jnr)	Posbus 398, PONGOLA, 3170
0175	WELLS, Mr B K	P O Box 7068, Newton Park, PORT ELIZABETH, 6055
0039	WENTZEL, Mr B	19 Rietfontein Road, Primrose, GERMISTON, 1401
1380	WENTZEL, Mnr P	Posbus 1016, KROONSTAD, 9500
0047	WENTZEL, Mr Stephanus	P O Box 1653, BROOKLYN SQUARE, 0075
2144	WESSELS, Mnr A P	Posbus 3110, KENMARE, 1745
0448	WESSELS, Dr F H	P O Box 7, PHALABORWA, 1390
1318	WESSELS, Mnr J W	Posbus 31, HEIDELBERG, 6665
2322	WESTLAND, Mnr Chris	Posbus 837, HUMANSDORP, 6300
1441	WIGGILL, Mr D L	P O Box 6260, FLAMWOOD, 2572
2408	WINTOUR, Mr A F	P O Box 1881, ALBERTON, 1450
0008	WOHLBERG, Mr H Edgar	10 Stephens Avenue, WESTVILLE, 3630
1950	WOLFAARDT, Dr L B	Posbus 1928, BROOKLYN SQUARE, 0075
9008	WORLD WILDLIFE FUND, DIRECTOR OF COMMUNICATION	P O Box 456, STELLENBOSCH, 7599
1164	WUNDERLIN, Mr P	9 Monarch Road, WESTVILLE, 3630
9009	WWF SOUTH AFRICA	(Att Dr Ian McDonald), P O Box 456, STELLENBOSCH, 7599
2245	YATES, Mr A E	16 Ferero Street, Eden Glen, EDENVALE, 1610

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0620	ADELAIDE BOTANICAL GARDEN	The Librarian (Karen Saxby), North Terrace, ADELAIDE, South Australia 5000
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0432	BRYANT, Mr D	Palmworld, 504/510 Parkridge Road, PARKRIDGE, Queensland 4125
1996	CASEY, Mr David	98 Groth Road, BOONDAL, Queensland 4034
2447	CHADWICK, Mr C E	9-2 Francis Road, ARTARMON, NSW 2064
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1347	HEIBLOEM, Mr P	P O Box 700, NAMBOUR, Queensland 4560
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1995	KEEN, Mr Alan	Cycad Gardens Nursery, 777 Teviot Road, NORTH MACLEAN, Queensland 4280
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1215	KRAA, Mr W	65 Lancing Street, PULLENVALE, Queensland 4069
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1518	MACHIN, Mr P	111 Dorrington Drive, ASHGROVE, Queensland 4060
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1553	PALM & CYCAD SOCIETY OF MACKAY (PACSOA)	P O Box 6639, MC WEST MACKAY, Queensland 4741
9012	PALM & CYCAD SOCIETY OF WESTERN AUSTRALIA	P O Box 170, COMO, Western Australia 6162
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1471	RANDALL, Mr L M	54 Cockatoo CT., CABOOLTURE, Queensland 4510
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1287	ROCH, Mr D E	7 Sublime Glade, NEERABUP, Western Australia 6031
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0906	BRUNNER, Mr Julius	Postfach 4, A-2326 MARIA LAZENDORF
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2147	CORDONNIER, Dominique	"La Palaudière", Chemin de Palau, 66700 ARGELES S/MER
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- 1680 SANTAGATA, Mr Luigi
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- 2424 SPECIALE, Manlio
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REPORT ON A JOURNEY TO DARKEST MEXICO IN PURSUIT OF RARE AND INTERESTING CYCADS - PART 1

undertaken in the last year of the 20th Century under the able leadership of Jeff Chemnick

botanical explorer, cycadologist, and member of the Cycad Society of South Africa

Piet Vorster

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Received 6 December 1999



CAPTIONS FOR FIGURES ON PAGE 37

TOP: Left: Colour Figure 10 *Dioon edule*: female cone on a plant near Vila Rico.

Centre: Colour Figure 11 *Dioon edule* near Palma Sola.

Right: Colour Figure 12 *Ceratozamia moretii* in habitat. Photo: Jeff Chemnick.

CENTRE: Left: Colour Figure 13 *Dioon edule* on the beach dunes near Vila Rico.

Right: Colour Figure 14 *Dioon edule* at the edge of a coastal dune clump near Vila Rico. Inside the clumps the vegetation is so dense that photography is impossible.

BOTTOM: Left: Colour Figure 15 *Ceratozamia moretii* hanging from a cliff face in the forest.

Centre: Colour Figure 16 *Ceratozamia mexicana* in dense forest near Elesquilon.

Right: Colour Figure 17 *Zamia loddigesii*, near El Rio Pescado

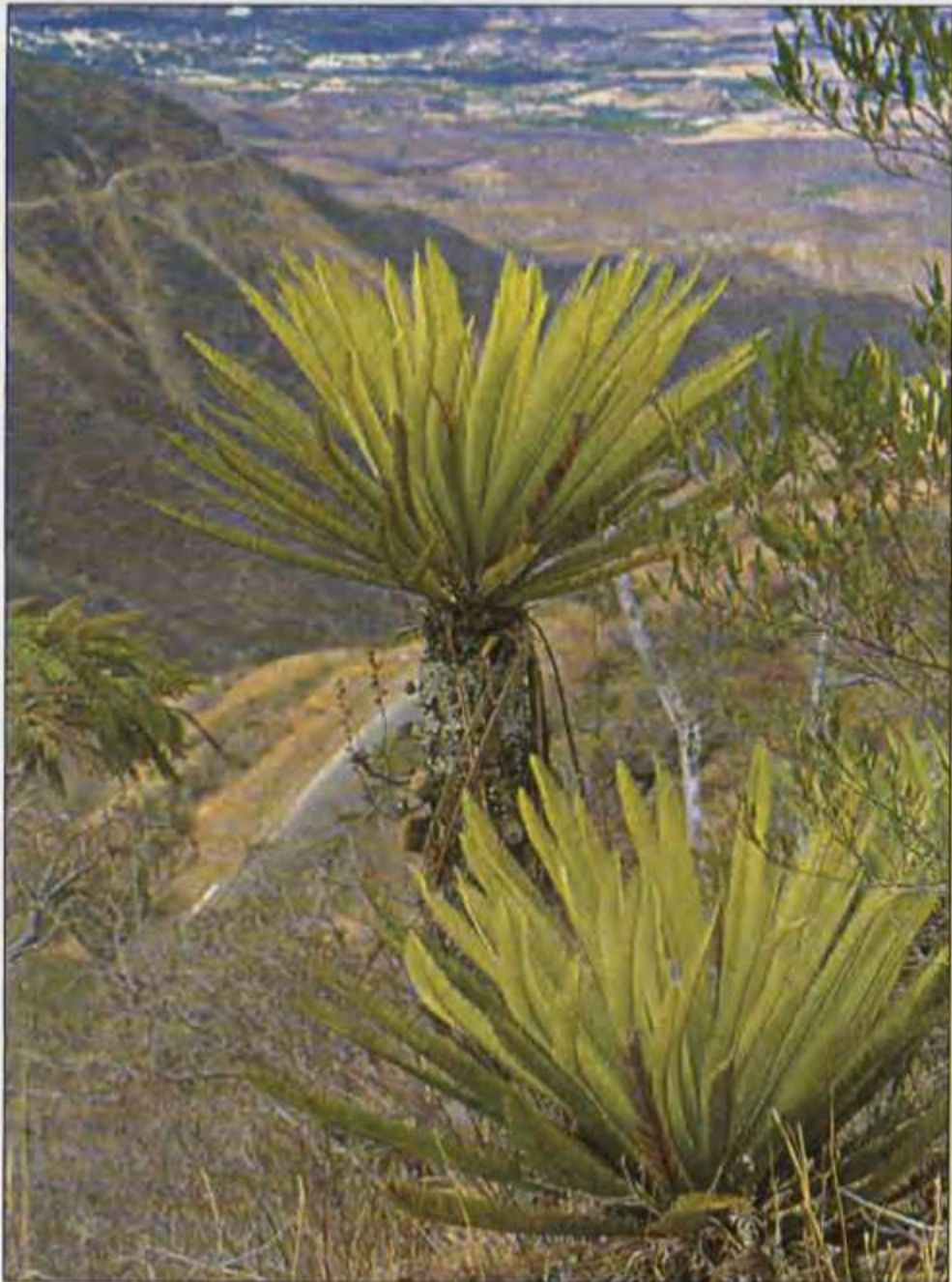
Early in August 1999, a handful of stalwarts of the international cycadological community effected a slightly premature departure from the CYCAD '99 conference in Miami. Any observer acquainted with these enthusiasts would have realised that something very unusual had conspired to lure them away. That something was the prospect of a cycad tour to Mexico.

Unlike previous International Conferences on Cycad Biology, the one in Miami offered no associated field trips. This was something of a disappointment to those of us who like a "hands-on" approach. When Jeff Chemnick therefore made it known that he would be willing to take a small group of us to Mexico to show us New World cycads in habitat, we grabbed the opportunity with both hands.

Our group was small and intimate, consisting of eight

Figure 1 Map of the area of Mexico traversed. By courtesy of the AAA.





CAPTIONS FOR FIGURES ON PAGE 38

TOP: Left: Colour Figure 18 *Ceratozamia* sp., near Palma Sola. Photo: Jeff Chemnick.

Right: Colour Figure 19 *Dioon edule* at Rio Pescada, photographed on another occasion by Jeff Chemnick.

CENTRE: Left: Colour Figure 20 *Dioon califanoi* with a stem 4 m long, near Teotitlan. Note how the leaflets are orientated in V-like arrangement. Photo: Jeff Chemnick.

Right: Colour Figure 21 *Dioon purpusii* with columnar cacti in the background.

BOTTOM: Left: Colour Figure 22 *Dioon califanoi*: a leaf. Note how the leaflets point towards the apex of the leaf.

Centre: Colour Figure 23 *Dioon purpusii*: adaxial (upper) surface of a recently emerged leaf. Note how hairy it is.

Right: Colour Figure 24 *Dioon purpusii*: devils in paradise. We found these caterpillars feasting on a leaf.



Figure 2 *Dioon edule*: bush clumps such as this one near Vila Rica harbours substantial numbers of plants.

people. These were Ian Turner from Zimbabwe; Ken Hill and his wife Leslie Greenwood, Stan Walkley, and Lou Randall from Australia, myself and Elsa, and Jeff Chemnick. We could not have wished for a better group. We have all been friends for many years; in fact, the only unknown factor was our leader whom most of us hadn't met before.

Jeff is nevertheless a long-standing member of our Society, resident in Santa Barbara in California. However, he travels a lot, and for more than twenty years he has been criss-crossing Mexican cycad country, exploring and mapping cycads. In the process he not only became thoroughly acquainted with the country and the cycads, but also with its people. Without his knowledge of the language and local customs, and above all his amiable way of dealing with the locals, I doubt whether the trip would have been possible.

We departed from Miami airport at midday, flying over the incredible Florida Keys (how can people sleep soundly on those thread-like sand-pits?), skirted the western tip of Cuba, and made our landfall at Merida, seeing an Aztec pyramid sticking out of the jungle as our aircraft came in to land. After clearing immigration formalities, we again took off, crossing the Bahía de Campeche to Veracruz.

Although it was close to sundown on our arrival, it was immediately apparent from the torpid atmosphere that we were definitely in a frost-free zone, with coconut palms everywhere in evidence. After our first encounter with the delicious Mexican cuisine, we turned in to charge our batteries for the next day's adventures.

On our first day in the field, we drove northwards from Veracruz along the coast, through lush vegetation - obviously heavily damaged by man, but ever ready to re-establish. Apart from the ubiquitous palms, we were amazed at the number and variety of epiphytes, mostly Bromeliaceae but also orchids and ferns, crowding out each other on every tree and fencepost and weighing down telephone wires. Near Vila Rica we stopped at the beach, and, walking for an hour along the seashore on black volcanic sand, encountered our first Mexican cycad (Figure 2, Colour Figure 10).

This, for want of a better name, is called *Dioon edule*, but does not look like the plants which we grow under that name in South Africa, having bright green leaves. The leaflets are fully 8 mm wide, and overlap (at least in plants growing exposed). These plants all grow in loose sea sand on the dunes, some of them in the open (Colour Figure 13) but most in bush clumps (Figure 2, Colour Figure 14). This habitat is very similar to that of *Encephalartos ferox*, and there cannot be many other



Figure 3 *Ceratozamia* sp.: habitat near Palma Sola. The plants grow in the forest above the cliff, but seedlings are colonising the cliff face below.

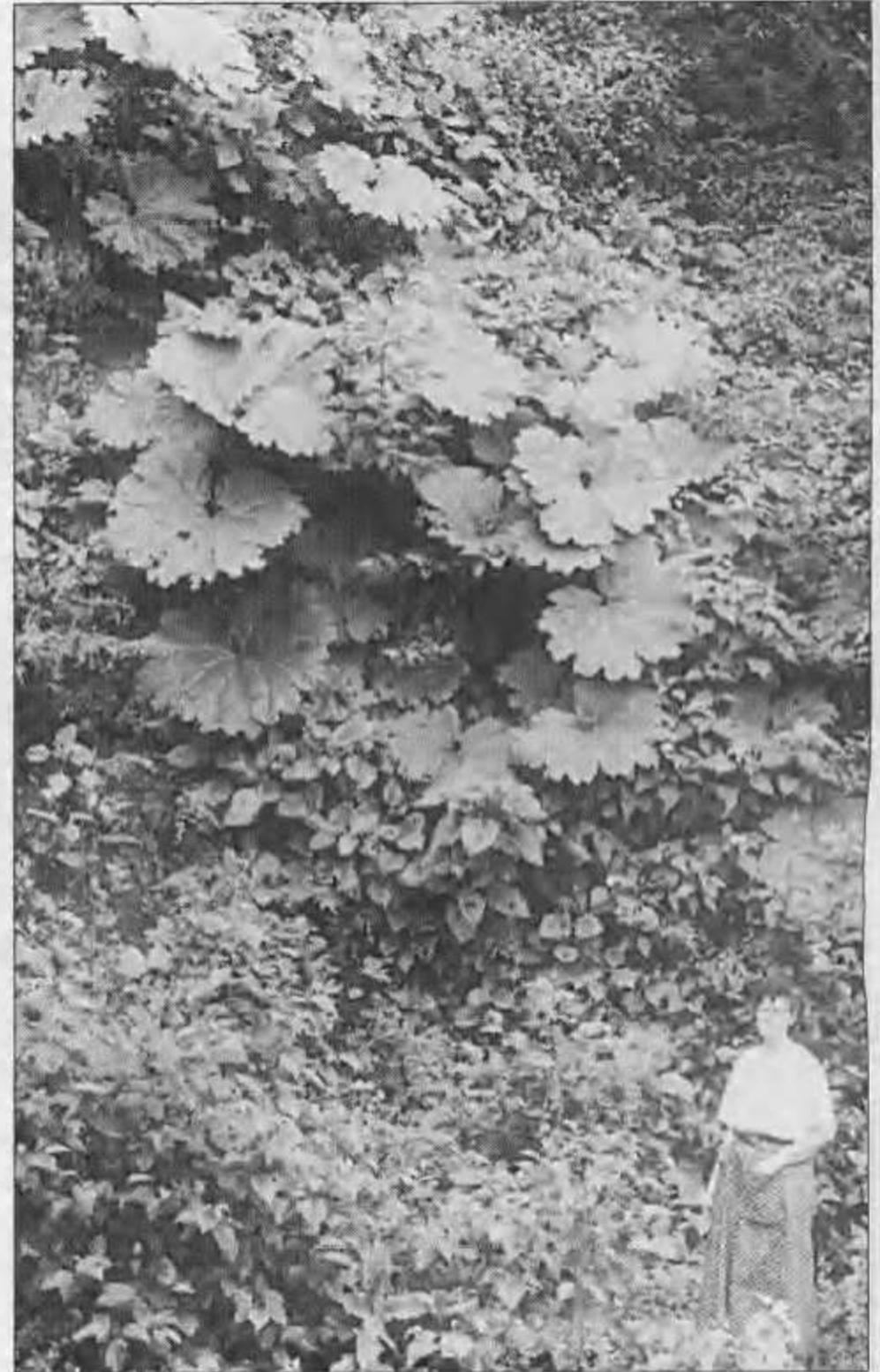


Figure 5 Giant *Gunnera* along the road leading to *Ceratozamia moretii*, with Elsa Vorster wondering where she would find space for one of these in her garden.

Left: **Figure 4** *Ceratozamia moretii*: A tired but very happy Ian Turner showing off a mature (left) and juvenile (right) leaf. Notice the mist-shrouded forest in the background.

CAPTIONS FOR FIGURES ON PAGE 41

TOP: **Figure 6** *Dioon edule*: habitat near Palma Sola. The plants grow in the bush clump at the edge of the foreground.

BOTTOM: **Figure 7** *Ceratozamia moretii*: habitat. The plants are in the forest on the left side of the view. Elsa Vorster is thinking that it is all very well to walk down to where the plants are, but one has to walk back up again afterwards.





Figure 8 *Ceratozamia mexicana*: habitat at type locality, near Elesquilon.



Figure 10 *Ceratozamia* sp.: habitat near Coróba. The plants hang from the limestone cliffs within the forest.



Figure 9 Dr. Andrew Vovides in the botanic garden at Xalapa.

cycad species with such an unusual habitat.

Our next stop was the village of Palma Sola, as typical a southern Mexican village as one can get. We had lunch there, excellent and spicy and based on chicken ("pollo" - I am still not sure that this was not parrot instead), in an outdoor restaurant enclosed in chicken wire to keep out the chickens, dogs, and pigs. Afterwards we continued to a patch of evergreen forest (Figure 3), inside which were a substantial number of large *Ceratozamia*s (Colour Figure 18). What these are, I cannot say: they were larger than the *C. mexicana* which I am growing in Stellenbosch, almost as big as the plants from Santiago Tuxtla which (perhaps erroneously) are known as *C. robusta*. As we subsequently found at so many places, *Ceratozamia* is difficult to photograph in nature because they grow in dense forest which is very dark but has bright spots where shafts of sunlight come through the canopy. The interesting thing was that this colony is bisected by a road cutting, and it definitely seems as if the plants are colonising the cutting. The underlying geological formation is limestone, but practically all the *Ceratozamia*s which we saw in Mexico grew in a thick layer of compost.



Figure 11 *Ceratozamia* sp. hanging from a cliff face near Cordoba. Who can spot the plant?

Our next stop was at a rather rural village nearby, dominated by an enormous church. As we were to find so often in ensuing days, Jeff had acquaintances in the village, and before long an entourage was lined up to accompany us to a nearby colony of *Dioon edule*. These plants (Colour Figure 11) grew against a low slope, hardly a cliff, forming the banks of a wooded ravine, and were pretty much in shade. The surrounding countryside of sparse bush clumps in grassland (Figure 6), and the situation of the cycads themselves, was very similar to the habitat of *Encephalartos altensteinii* and *E. natalensis*. Apart from the usual abundance of epiphytes, numerous plants of the epiphytic cactus *Rhipsalis* grew on the small trees dotting the grassland.

Our second day began with a quest to see the recently described *Ceratozamia morettii*, north-west of Xalapa. This species grows on the steep forested slopes of a rather deep valley (Figure 7), and our hopes of a gentlemanly sightseeing trip were dashed by a landslide near the top of the road descending into the valley. Being enterprising enthusiasts, we left our conveyance and walked some 250 metres down the road. This proved to be a blessing in disguise, for the cliffsides along the road were festooned with Araceae, Begonias, giant Gunneras, and a climber seemingly of the Alstroemeriaceae (Figure 5). Parts of the forest contained *Podocarpus*. *Ceratozamia morettii* proved to be a strange, but hardly

showy plant. It has only a few leaves, and sort of hangs from cliff faces which makes it difficult and hazardous to examine or photograph (Colour Figures 12, 15). Though the associated vegetation is a low evergreen scrub (hardly forest), the cliff-hanging habitat means that the plants are in quite exposed positions, so much so that they can readily be spotted from the road below the cliff.

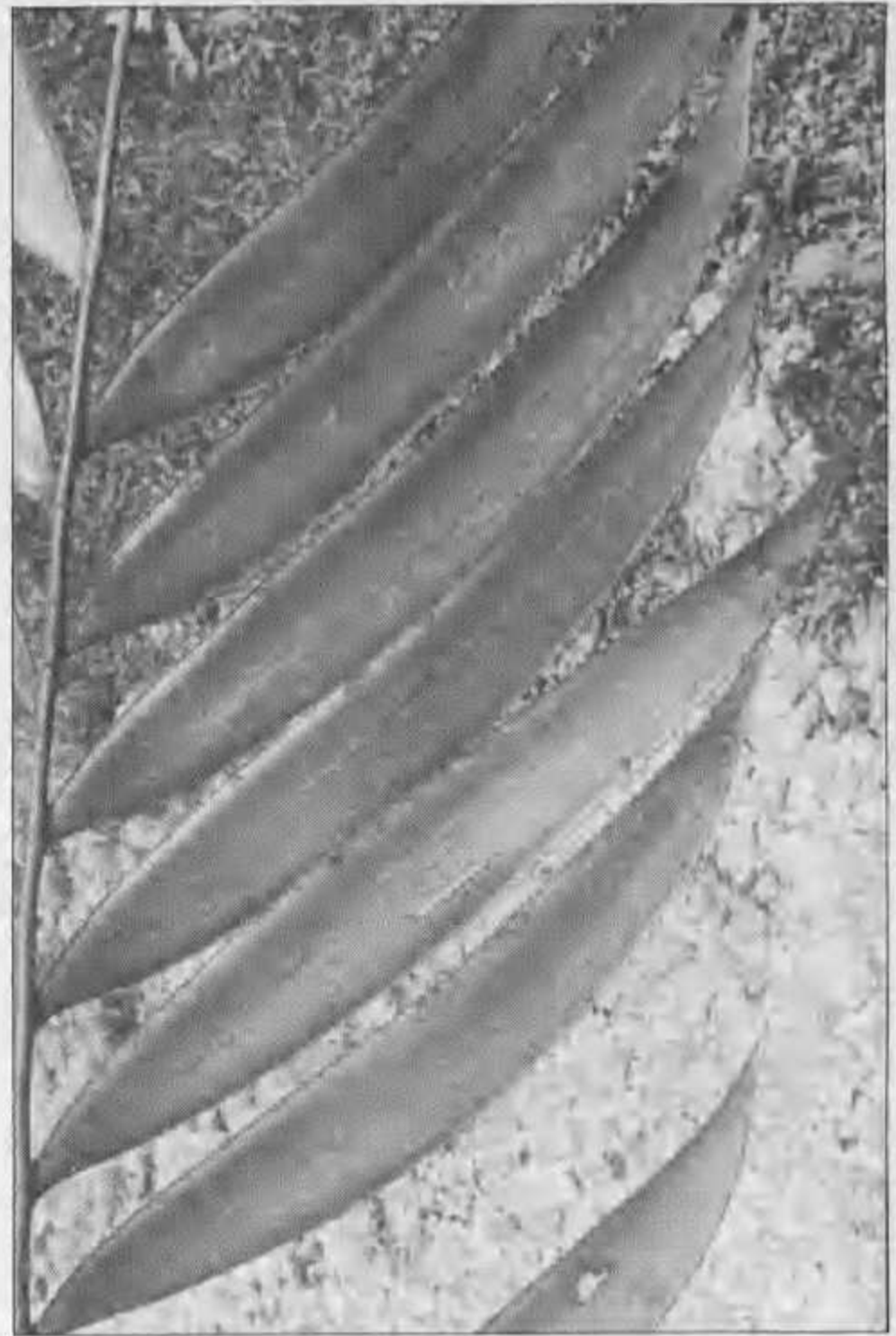


Figure 12 *Ceratozamia* sp. near Cordoba: part of a leaf.

The day still being young, we stopped at a very steep and forested knoll (Figure 8) to see *Ceratozamia mexicana* (Colour Figure 16). These plants grow in quite dense shade, which makes them difficult to photograph, and the terrain is so steep and slippery that walking was positively dangerous. The altimeter registered 1200 m. This place, Elesquilon, was a particularly interesting place, as I understood that it is the type locality of *Ceratozamia mexicana* (from where it had first been described). All subsequently discovered *Ceratozamia*s therefore have to be assessed against these plants.

The afternoon was put aside for the botanic garden in Xalapa. After a late but particularly nice lunch which included rice milk, in the garden's restaurant, we were shown the garden and its research collection by the director, Dr. Andrew Vovides (Figure 9). His name will be familiar to many of our readers: he has been involved in the description of several new species of Mexican cycads, he is co-discoverer (with Dr. J. Fischer

of the Fairchild Tropical Garden) of mycorrhiza in cycads, and he successfully involved local people in a project to propagate rare cycads from seed and sell these abroad. It is a well-tended garden with some interesting plants, but to us the most interesting part was the shade house complex where the research collection of cycads is housed. It was abundantly clear that there are still numerous undescribed Mexican cycads, but habitat destruction is destroying them faster than they can be collected for scientific study.

It was getting late, and it became time to make a beeline for our nightstop. Nevertheless, we made time to stop briefly in a wooded mountain pass near El Rio Pescade where it was just possible to see some enormous plants of *Dioon edule* on the clifftops lining the road (Colour Figure 19). However, the terrain was so inaccessible that we could not even get close enough to photograph the plants. Just before nightfall we stopped at a place with rather dry, bushveld-like vegetation; and there, on the stony ground in the grass, we found our first *Zamia*, looking to us like *Z. loddigesii* (Colour Figure 17). That night was spent in a village called Fortin.

The third day commenced with a visit to a very tropical-looking site near Cordoba. It consisted of a pretty tall, steep, and densely forested limestone ridge (Figure 10), at an altitude of about 600 m. Our quarry, an undescribed *Ceratozamia* with only one or sometimes two leaves (Figures 11, 12), is a true cliff-hanger and immensely difficult to spot where it is wedged into cracks in sheer limestone faces, and even more difficult to get close to. Jeff told us that this population has shrunk almost to extinction because of an unfortunate circumstance which we witnessed repeatedly during the following days: many species of *Ceratozamia* grow in places which are also very suitable for coffee planting. The result is that the *Ceratozamia*s get killed when the land is cleared for planting, and sprayed with weedkillers to keep the ever-encroaching natural vegetation in check.

At this stage we all felt the need for some relief from cycads, if you can believe this possible, and we took a detour to the state of Oaxaca to see some desert plants. On the way, just outside Cordoba, we were met with the incredible sight of the snow-covered volcano Orizaba (5610 m high when last measured), with sugarcane plantations in the foreground. The desert which we saw, on the excellent toll road between San Gabriel Chilac and Nochixtlán, is certainly not desert as we know it in Africa. It was quite well vegetated, and I would equate it with the Noorsveld of the Eastern Cape, or drier parts of Sekukuniland. Like so much of south-eastern Mexico, this area is also dramatically mountainous. The vegetation is stunted, sparse, and low, with shrubs of *Acacia* and Burseraceae much in evidence. However, the most dramatic component is the Cactaceae, including the clumps of gigantic barrel-shaped *Echinocactus platycanthus*, and thousands of monolithic

Neobuxbaumia tetetzo. Other conspicuously common plants included *Beaucarnia*, *Dasyllirion*, and *Plumeria*, with the ubiquitous terrestrial and even epiphytic Bromeliaceae. The night was spent in Teotitlán after deciding against a little hotel which only rents rooms out by the hour, but not before yet another supper of the most deliciously flavoured fare.

On the fourth day we realised with some sadness that half our allotted time in Mexico had already gone. On this day our journey took us up a high and tortuous mountain pass, with dense thorn scrub looking just like the vegetation at lower elevations of the eastern South African escarpment. There were *Acacia* shrubs looking straight out of Africa, but there were others also with swollen, ant-inhabited spines. Reader, you can believe everything which you have read about those ant-spine *Acacias*. The moment when one touches those plants, the ants swarm out of little holes in the thorns, and start biting. Goodness knows where they all come from so suddenly, but I saw them with my own eyes and felt their fierce bites, and can vouch for the effectiveness of the ant-*Acacia* association. Here we found no less than *Dioon califanoi* (Colour Figures 20, 22), in dry and somewhat sunny situations amongst the scrubby bushes, not unlike the conditions under which *Encephalartos princeps* grows. Some plants had short trunks, but some were fully four metres tall.

Our other quest for the day was the elusive and strangely poorly known *Dioon purpusii* (Front cover and Colour Figures 21, 23, 24). Compared to Africa, in Mexico it is easy to get to cycads, yet the road which we took through the mountains was long, tortuous, and utterly breathtaking. I think all of us were sorry that we couldn't stop every few hundred metres to botanise. We drove to within an hour's walk of the *Dioon* locality, when landslides forced us to stop and hike the rest of the way. This proved to be a very pleasant, gradually ascending, and easy walk along a contour, through various vegetation types including pine-oak forest. The *Dioons* occur at an altitude of about 1600 m. These cycads had been discovered only recently, and are more or less untouched by man. There are huge plants, some with trunks at least 5 metres tall, and suckering from their bases. They grew on a steep slope as well as along the upper edge of a cliff, in epiphyte-rich savanna. The habitat seemed to me very similar to that of *Encephalartos natalensis*. It was particularly gratifying to see ample evidence of seedling recruitment.

The night was spent in the town of Oaxaca, in the Hotel el Paris no less. More strange and delicious food at our usual suppertime, shortly before midnight, followed by a memorable encounter with mezcal, the "national" drink of Oaxaca, with a well-pickled caterpillar in the bottle to prove its authenticity. These caterpillars looked to me very similar to those seen earlier in the day demolishing the leaves of *Dioon purpusii* (Colour Figure 24). I am quite sure that mezcal can be used to fuel aeroplanes.