ISSN 01311419

A.S.G.A.P. CYCAD, ZAMIAD AND PALM STUDY GROUP
NEWSLETTER NO. 52 - AUGUST - SEPTEMBER

Leader: L.P. BUTT - 07 - 8483515
Asst: Brian Runnegar - 07 - 2861164

This issue could be controversial, but I assure you it is not meant to be so. Having just, and once again, received another very critical letter from the Cycadale enthusiast and my severest critic, Paul Kennedy mainly attacking me for having the audacity to answer his blistering comments on my credibility on statements in the 'Introduction to the Zamiacea in Australia 1991'.

Below, I have published his latest article from PRINCIPLES MINOR 1992 on his findings on the Zamiad Lepidozamia perroffskyana. This is very well written, and carefully researched, but then I have in my retaliation never ever said the gentleman did not know his N.S.W. subjet. This however he has often said of me, about all Cycadales. Please note, when reading that for someone so very correct, the term CYCAD is used on all occasions, when it is now accepted (except by certain Nurserymen) that the plant is a Zamiad. After twelve years of writing it seems I still find it hard to get accepted that Cycas are the Cycads, and Cycadaceae is the plural. All others are Zamiads at least when referring to Australian forms. The solution to avoid confusion, is obviously to use the old group name CYCADALES.
Kennedy invites you to comment to me the differences between what I have said on this Zamiad and what he knows of it. I urge that you do so, and please note his article is almost wholly about the N.S.W. form, which other enthusiasts in our study group have also told me has some differences to the Queensland form.

I have never actually field researched in N.S.W., unfortunately have had to rely on letters and papers from southern members of our study group to fill this gap. Particularly in the case of some statements on descriptions of the N.S.W. section parazamia given information and that taken from established papers was dated, and not as accurate as could have been, but in N.S.W. information only.

../2

however this after all is the prime cause of our group, to ferret out mistakes correct them, for the mutual benefit of all. Another very vital cause, and one we areall pursueing, is the eventual protection of a plant family already in danger, on this issue as my books will verify I am adamant, and I am sure we all are too, or would not be in this group . . .

In the many papers I have read of Paul Kennedy I have yet to see the same attitude to protect or even to educate graziers on conservation methods concerning the Cycadales.

In my most humble opinion, any errors written, are not as important as the eventual achievement of having saved yet another ancient and valuable plant family.

L.P. BUTT

ED., note.

LEPIDOZAMIA PEROFFSKYANA

by Paul Kennedy

Lepidozamia peroffskyana is a large cycad which is endemic to Eastern Australia and which grows in both northern New South Wales and south-eastern Queensland. It has a distribution range which stretches over approximately 600 kms of coastal and near coastal areas and which extends from near Taree on the mid-north coast of New South Wales to near Nambour, north of Brisbane, in Queensland.

Climatic information relating to Murwillumbah, Coffs Harbour and Taree - which are situated near the extremities and the centre of the New South Wales distribution range of *L. peroffskyana* - and covering altitude, annual average rainfall, number of rain days and frost days per year and minimum and maximum temperatures reached at least once per week in July and January, respectively, is as follows:

	Altitude (metres)	Annual Average Rainfall (mms)	Rain Days	Frost Days	Temperature Range July Minimum	January Maximum
Taree	5	1178	116	10	1.3	33.3
Coffs Harbour	5	1708	144	6	2.6	28.9
Murwillumbah	18	1687	156	4	3.6	32.1

Over 60% of the annual rainfall covering the New South Wales distribution range of *L. peroffskyana* falls in summer and autumn, but on a seasonal basis the rainfall pattern is very uniform with 50% falling in spring and summer and 50% falling in autumn and winter. The percentage seasonal rainfall pattern is as follows: Summer: 32%, Autumn: 32%, Winter: 18% and Spring: 18%.

L. peroffskyana is the tallest growing cycad in New South Wales. It normally grows in large dense stands, sometimes in abundance - I use the term "in abundance" to describe situations in which adult plants grow so prolifically that the fronds of numerous plants growing very close together actually overlap each other.

L. peroffskyana grows in abundance at altitudes of 500 to 700 metres near Dorrigo which is the wettest town in New South Wales with an annual average rainfall of approximately 2,000 mms (80 inches) spread over 149 rain days. Detailed weather information, apart from rainfall statistics, is, unfortunately, not available for Dorrigo. Forest areas near Dorrigo are heavily infested with leeches, ticks and mosquitoes.

L. peroffskyana normally grows under a eucalypt canopy in habitat locations ranging from stabilised sand dunes and sand hills near the ocean to steep slopes of mountain ranges adjoining the sometimes narrow coastal plains belt. On the mountain ranges it grows in areas of wet sclerophyll forest bordering on rainforest, while in proximity to the ocean it can be found growing in either depauperate littoral rainforest or open scrubby forest.

The principal characteristics of *L. peroffskyana* are:

(1) a tall columnar trunk, normally standing 0.6 to 1.8 metres above ground level and ranging up to 35 cms in diameter (but with some plants having trunks reaching up to 5 metres above ground level),

(2) a maximum of approximately 50 to 60 very glossy, dark green fronds which range up to 2-3 metres in length,

(3) an untwisted rhachis,

(4) entire pinnae, which rise in an arching manner from the rhachis but then tend to droop - with the median pinnae extending at right-angles to the rhachis and the apical and lower pinnae extending (from the rhachis) at angles of approximately 30 and 120 degrees, respectively, and

(5) seeds with reddish coloured flesh; though seeds with yellow coloured flesh also occur in some stands.

L. peroffskyana usually has an unbranched trunk, though in some stands it is not uncommon to find multi-headed plants or plants with branched trunks - with some plants having as many as 5 separate trunks. This tendency for plants to branch occurs in some stands, but in other disjunct stands there are no plants at all with branched trunks.

The tallest *L. peroffskyana* plant that I have seen growing in New South Wales (see habitat photo) was a plant which branched, 1.8 metres above ground level, into 2 separate trunks, which were, respectively, 3.1 and 3.3 metres long - thus making the overall height of this particular plant a little over 5 metres tall.

A unique feature of *L. peroffskyana* is its rare capacity to produce sporophylls holding three seeds, as opposed to the normal two seeds. The 3 seed-sporophylls (see photo), which are normally only found in the basal area of a cone, have two seeds sitting side by side with the third seed placed above (and in the middle of) the other two seeds so as to form a triangular pattern.

Seeds of *L. peroffskyana* are the largest seeds of any New South Wales cycad and measure up to 6 cms long and 3 cms in diameter.

New fronds of *L. peroffskyana* are produced in flushes and often rise in an upright manner (with furled pinnae) for a considerable portion of their ultimate length before the pinnae begin to unfurl. The pinnae on new fronds are a distinctive bronze colour but change to a glossy dark green as the fronds reach full size and undergo a hardening process.

During the relatively short period of time in which new fronds reach full size and harden-up, the pinnae are extremely glossy and shiny - so much so that the sunshine is brilliantly reflected by the numerous new fronds, especially when all the plants in a stand have produced new growth after a fire (see habitat photo).

With age, the fronds tend to arch and produce a graceful palm-like appearance.

The pinnae on *L. peroffskyana* rise alternately from the midline of the rhachis, as opposed to the pinnae on various Macrozamia species which rise (or extend laterally) from the edges of the rhachis. In contrast with most Macrozamia species, the pinnae on *L. peroffskyana* do not have a prominent callous at the point where they join the rhachis; nor do *L. peroffskyana* fronds have sharply-tipped pinnae like *M. communis* or spiny pinnae-appendages like (the New South Wales form of) *M. moorei*.

Additionally, the sporophylls on female cones of *L. peroffskyana*, as opposed to some Macrozamia species, do not have elongated spines - though the sporophyll ends are pointed and generally bent sharply outwards and sometimes downwards; and, in some respects, could be said to have a rudimentary spine.

Both male and female cones are large and, in contrast with Macrozamia cones, do not have a peduncle.

Female plants usually have solitary cones, though plants with two cones are not uncommon (see habitat photo of two adjacent female plants, each with two cones). Female *L. peroffskyana* cones are the largest cones of any New South Wales cycad and, when mature, measure up to 50-60 cms long and 20-25 cms wide.

One unusual feature of mature female *L. peroffskyana* cones is that it is possible, with some difficulty, to break away the sporophylls from their own stems (which remain attached to the central axis of the cone) and leave the seeds intact on the cone, whereas the sporophylls on various Macrozamia species, together with their stem and seeds, usually break away from the cone at the point where the stem joins the central axis.

It is thus possible to photograph a mature female *L. peroffskyana* cone with all, or most, of its seeds intact on the cone, but without the protective covering provided by the sporophylls.

Like female plants, male plants can also have one or two cones, though plants with two cones are uncommon. Male cones open up in an unusual spiral fashion and distend when about to shed pollen. Prior to distending, male cones measure up to 50-60 cms long and 10-12 cms wide. When cones are fully distended they can reach up to approximately 1 metre in length.

Natural regeneration of L. peroffskyana in the wild is evidenced by the large numbers of seedling plants which can often be seen growing in the vicinity of parent plants; though, on average, very few of these seedlings ultimately grow to maturity.

As mentioned previously, there is a tendency for *L. peroffskyana* plants to branch in some habitat locations, but not in others. It is also noticeable that the average size of plants can vary in different habitat locations - for example, plants at Mt Tamborine (in south-eastern Queensland) are generally taller and more robust than plants at Dorrigo, even though at both locations the plants grow on steep slopes of mountain ranges which border the coastal plains, at a distance of less than 40 kms from the sea.

Even though Mt Tamborine and Dorrigo are some 250 kms apart, the reason for the size variation is undoubtedly edaphic (that is, it relates to the physical and chemical characteristics of the soil) as opposed to climatic, as stands of *L. peroffskyana* - which grow in a reasonably widespread, though localised, pattern over almost its entire distribution range - are usually subject to reasonably uniform climatic conditions (apart from some stands which are located near the southern extremity of the New South Wales distribution range).

Stands of *L. peroffskyana* are often found in State Forests and are subject to planned periodic burn-offs by the Forestry Commission.

The trunks and crowns of *L. peroffskyana* are often host to epiphytic plants such as *Platycerium bifurcatum* (elkhorn), *Asplenium australasicum* (bird's-nest fern) and *Davallia* species (hare's-foot ferns). In the Byron Bay area, somewhat unusually for a cycad, *L. peroffskyana* grows alongside the Australian native palm, *Archontophoenix cunninghamiana* (the "bangalow" palm).

L. peroffskyana is probably the most widely cultivated New South Wales cycad as it is fast growing, has extremely attractive fronds and makes an excellent potted plant or garden specimen.

From time to time adult and semi-adult *L. peroffskyana* plants, which have obviously been taken from the wild, are available for sale in nurseries. In my opinion, there is an inherent risk in purchasing such plants as they may well be infested with the potentially destructive weevil, *Tranes internatus.*

The damage which can be caused to cycads by *Tranes internatus* was the subject of an article on "Cycad-Insect Relationships" in Issue No 34 of "**Palms & Cycads**". In this article mention was made of reports of the problems caused in California in the late 1970's and early 1980's by *Tranes internatus*, which was suspected of having been introduced into the U.S., during the late 1960's, in the caudices of imported Australian cycads.

Further historical evidence of the activities of *Tranes internatus* is available by reference to an article written, over 100 years ago, in 1886, by J O Westwood in a Belgian Entomology Journal. In this article, Westwood described (and illustrated) the ravages caused by larvae identified as *Tranes internatus* which had been found in the caudex of an imported Australian cycad in the city of Ghent. The relevant plant which was described as "*Zamia corallipes*" was probably either *M. spiralis* or *M. communis*, though there is insufficient evidence in the article to now positively identify the particular Macrozamia species involved.

Tranes internatus was thus capable of surviving a lengthy surface trip to Europe in the early 1880's (and, also, of withstanding probable fumigation when imported into the U.S. in the late 1960's) and was then able to reproduce in a new and quite different environment.

Three conclusions about *Tranes internatus* can be drawn from the above:

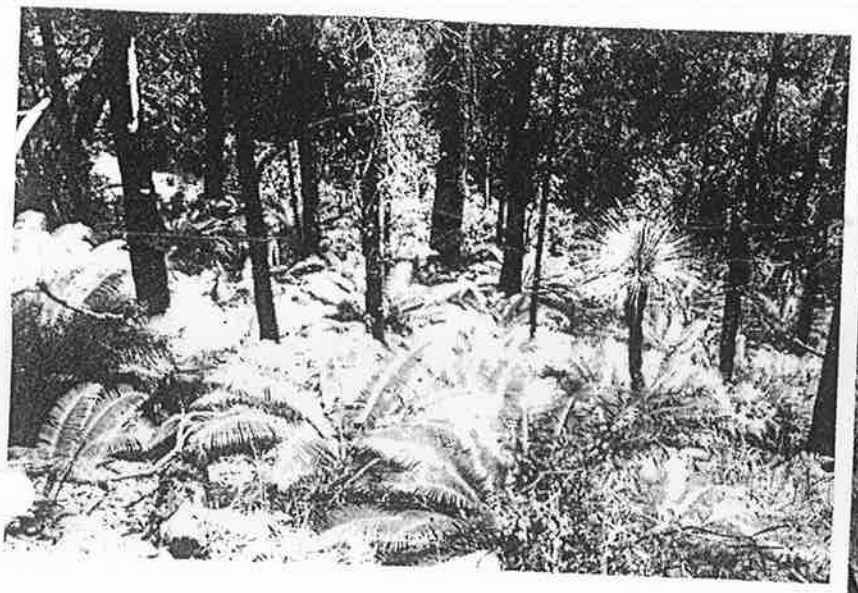
first, that adult weevils apparently live deep inside cycad caudices, possibly in tunnels created by larvae and can resist most normal insecticide treatments,

second, that when removed from their own environment, the weevils are probably isolated from their natural enemies and are able to freely multiply, and

third, that there is an extremely long time interval between the arrival of *Tranes internatus* in a home garden and its emergence as an identifiable problem.

Having recently seen *Tranes internatus* breeding in an immature female *L. peroffskyana* cone, it is my opinion that the purchase of *L. peroffskyana* plants taken from the wild (or the taking of any cycads from the wild) is a little like a lottery, with the chance that if you happen to end up with a plant which is infested with *Tranes internatus*, you may unknowingly have a mini-ecological 'time-bomb' on your hands!

On an affinity basis *L. peroffskyana* is related to *Lepidozamia hopei*, the only other member of the genus. The much broader and darker green fronds of *L. hopei* render the two species easily distinguishable.



(above left) L. peroffskyana, in habitat - with the sun being reflected from new fronds.

(above right) Five metre trunked specimen of L. peroffskyana in habitat.

(below left) Two adjacent female L. peroffskyana plants in habitat - each with 2 cones.

(below right) 3-seed sporophylls of L. peroffskyana.