

ASSOCIATED SOCIETIES FOR GROWING AUSTRALIAN PLANTSINDIGENOUS CYCAD, ZAMIAD AND PALM STUDY GROUP NO. 33

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Please note new name of groups. This has come about because no new leader for palm group emerged and I do not wish to abandon it. If a new leader emerges we can continue just as cycad and zamiad.

At present we will discuss one palm per newsletter and I'll try to make it not just a tag-on to the first group. The name has approval of our co-ordinator. New fee is payable June each year, fee suggested @4.50 inclusive.

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MANGROVE PALMS

Nypa fruticans grows in creeks and estuaries along the tropical coast of North Queensland. It is a monotypic genus widely distributed on coastal mudflats from Ingham up into the Northern Territory. This strange seemingly trunkless palm generally occurs where the water is brackish but tends to freshen with rains. It occurs in localised colonies. Actually there are larger stands of it also in parts of Malayasia. The species is a feather palm and actually has a procumbent nearly subterranean trunk. The branching prostrate trunk is forked and branched usually 30 cm's thick and just below the water line. It roots along the undersurface of these trunks, the upright fronds can measure from 4 metres to 9 metres in an erect crown. The leaflet (pinnae) are generally at least 100 per frond stem.

It actually grows as a mangrove and my experience in actually seeing a creek full of them was with Brien Bosworth during a day in 1985. The palms are quite unique and very awe-inspiring. Information by David Jones suggests the areas involved in Australia are fairly small and scattered and there is little indications our Aboriginals made use of them.

Indonesian countries however use the palm at thatchery, and a number of products including sugar, vinegar, alcohol, this from the sap of the fruit stalk. The seed is also edible.

In Cardwell areas the native name of this palm is "Ki-bano", possibly our natives did at least eat the seed. Overseas natives call the fruit water coconuts. A great fruiting head appears just out of the water. The flowering head is very large and made of a cone of segments which detach at maturity and float on the tide, thus obtaining distribution and germination. When the fruit splits open a jelly like sticky and edible endosperm is revealed. It is not known if Nipa fruit would germinate and establish in garden soil, but the experiment is worth trying if you live near a tidal stream which has the brackish - cum - fresh conditions.

As an ecology factor the Nypa palm is a wonderful shore binder with its mangroving habit. Many species of bees, drosophila flies, ants, and slugs are the pollinating agents of the Nypa.

At this point I would like to appeal to all palm members to submit short or long articles on their experiences and culture with native palms. I am sure even a 200 word effort would not be a real burden.



- Editor.

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Size distribution and coning behavior of the Australian cycad Lepidozamia peroffskyana.

by Prof Bob Ornduff.

Lepidozamia peroffskyana Regel (Zamiaceae) is a tall, palm-like cycad that occupies a limited range in coastal rainforests or wet sclerophyll forests of southeastern Queensland and northeastern New South Wales, Australia (Johnson, 1959). The cones of this species are massive, with male cones reaching 90 x 12 cm or more and female cones 80 x 30 cm or more (Johnson, 1961; illustrated in Butt, 1984; pers. obs.). The seeds likewise are large, reaching 6 x 4 cm (Johnson, 1961; Butt, 1984) and weighing up to 33 g each (Ornduff, unpub.). In view of recent renewed interest in the reproductive phenology of cycads (Norstog et al., 1986; Tang, 1987) and phenological differences between males and females in this group of plants (Ornduff, 1986, 1987; Clark and Clark, 1987), I studied various features of the reproductive behavior of L. peroffskyana in the field.

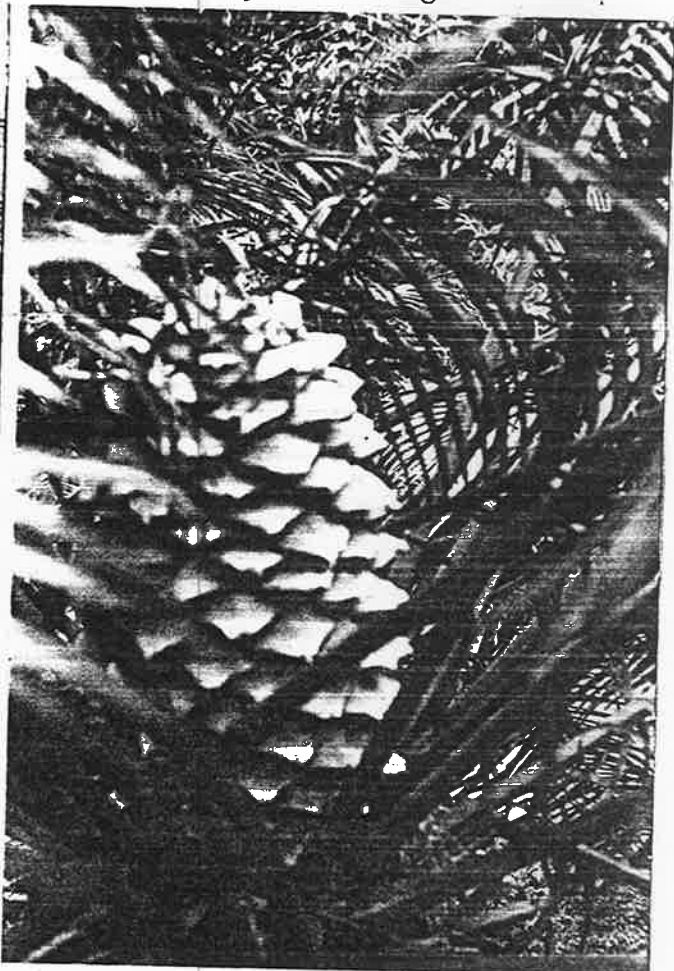
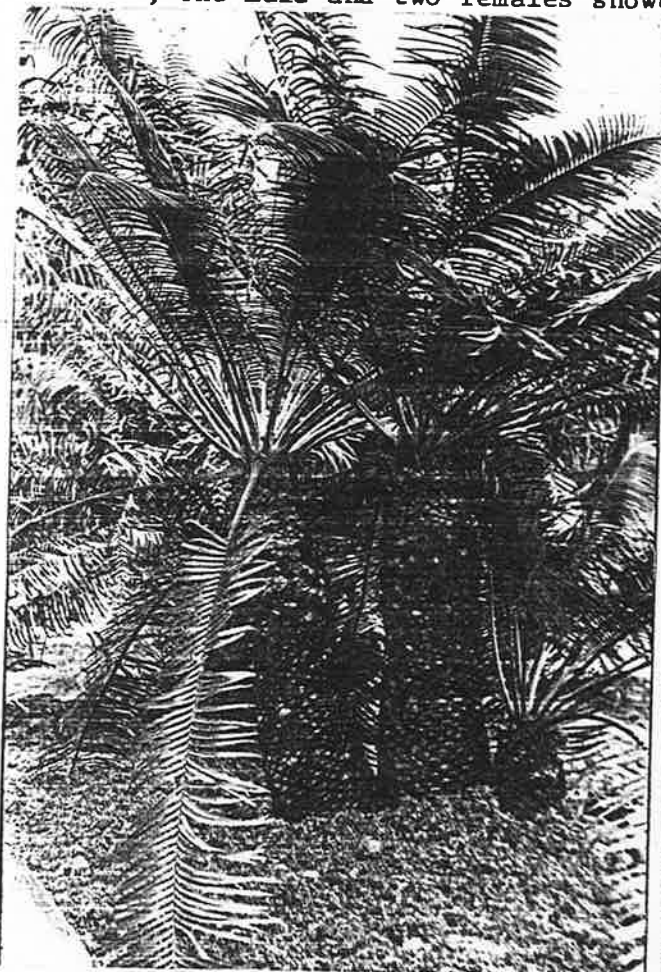
Materials and Methods

Two populations of Lepidozamia peroffskyana were studied in January 1987, both in New South Wales. One occurs on relatively steep slopes on and below a ridge top between Dorrigo and Thora at the edge of Dorrigo National Park. The population here consists of scattered plants growing in moderate shade under a high eucalypt/Casuarina canopy. At the time of sampling, female cones were ca 30 cm long and males cones were ca 90 cm long; both were judged to be nearly at the pollination stage. The second population occurs on a ridge top at Sealy Lookout, Bruxner Park Flora Reserve, north of Coffs Harbour. This large population grows on gentle slopes in the shade of a dense eucalypt/Casuarina canopy. The basal sporophylls of the cones of two male plants in this population were beginning to separate at the time of observation, indicating the beginning of the pollination phase. The sites occupied by both populations showed evidence of prior fires, but the presence of dense litter on the ground and in the crowns of the plants suggested that these fires were not of sufficiently recent occurrence to affect coning behavior or leaf production.

These populations were surveyed by walking through them and recording certain features on all individuals (except one-leaved seedlings) in the sample area. Stage distribution was estimated by counting leaf number of all plants encountered, presence and number of male and female cones of the current season, and evidence of cones from prior reproductive episodes. Sex ratios were calculated. Weevils were collected from two mature male cones in the Lookout population and identified by E. C. Zimmerman.

Results

Fifty-one individuals were examined in the Dorrigo population and 116 were examined in the Lookout population (Fig. 1). In both populations, males and females with current season's cones all bore single cones each. In the Dorrigo population, one male and two females bore cones of the current season; two males and five females showed evidence of prior coning. One male bore a current season's cone as well as one from a previous year. In the Lookout population 20 males and 11 females bore current season's cones; one male and two females showed evidence of prior coning.



In the Dorrigo population, leaf number (excluding one-leaved seedlings) ranged from 2 to 56 leaves per plant (Fig. 1). The average number of leaves borne by plants with current or prior season's cones was 38.0 for males and 39.0 for females. The average number of leaves borne by established plants showing no evidence of coning was 25. On the assumption that individuals with 28 or more leaves are sexually mature (qualified below), 25 individuals, or 50 percent, of the Dorrigo population are sexually mature. Twelve percent of the sexually mature individuals were participating in the current pollination phase and 28 percent showed evidence of coning in a prior season.

In the Lookout population, leaf number ranged from two to 63 leaves per plant. The average number of leaves borne by plants with current or prior season's cones was 32.1 for males and 37.7 for females. The average number of leaves of established plants showing no evidence of coning was 17.5. On the assumption that plants with 21 or more leaves are sexually mature, 61 individuals in the sample, or 53 percent of the population, are sexually mature. Fifty-one percent of the sexually mature individuals were participating in the current pollination phase and 5 percent showed evidence of coning in a prior season.

Discussion

Size distribution of populations: It is difficult to estimate the ages of cycads under field conditions. Johnson (1959) noted that plants of Lepidozamia peroffskyana, cultivated under poor conditions in Sydney, reached a height of 2 m in less than a century, and suggests that under field conditions the tallest individuals are less than 500 years old (vs. the 10,000 years reported in popular articles). However, in Macrozamia communis, the presence of a trunk is influenced by edaphic factors (Johnson, 1961) and may not be a reliable indicator of age. The leaf numbers utilized in this paper are taken less as an indication of age than as an indication of sexual maturity and may, in fact, serve as a more reliable predictor of sexual behavior than age (see Werner and Caswell,

1977). Leaves are produced in seasonal flushes and remain on plants for two or three years. In both populations of L. peroffskyana the average leaf number of plants with current or previous seasons' cones ranged from 32 to 39. There were no differences between leaf number of coning male and female plants in the Dorrigo population and somewhat more leaves for known females than for known males in the Lookout population. The lowest number of leaves for a mature plant was 21 for the Lookout population. The average leaf number of established plants showing no evidence of coning was 25 at Dorrigo and 17.5 at the Lookout. Since these figures include all non-coning individuals in the population, many of which are undoubtedly mature, the fact that leaf number of non-coning individuals is lower than that for plants with current or previous seasons' cones suggests that both populations contain substantial numbers of immature plants. On the basis of leaf number, about half the individuals in the in both populations are judged to be sexually mature.

Coning frequency: The two populations of L. peroffskyana studied contain similar proportions of sexually mature individuals. Only 12 percent of the mature plants in the Dorrigo population bore current season's cones compared with 51 percent in the Lookout population. In contrast, 28 percent of the Dorrigo population showed evidence of prior coning compared with 5 percent of the Lookout population. Previous coning of some individuals is evidenced by the presence of old dry cone stalks, occasionally with a few attached basal sporophylls, retained by plants of both sexes, and by large numbers of seeds scattered at the base of plants. Where seeds were seen without evidence of cones on the presumed female parent, such individuals were not included in the counts of plants showing evidence of prior coning. In addition, numbers of individuals with prior season's cones are probably female-biased because female cones are more massive and contain harder tissues than do male cones. At maturity, both are attacked by fungi and other microorganisms as well as by termites, and it is probable that under these conditions some old female cones persist

Male-biased sex ratios have been reported for species of the cycad genus Zamia (Ornduff, 1986, 1987; Clark and Clark, 1987), with the ratio of males to females coning during a given season varying according to environmental conditions.

TO BE CONTINUED