

**SGAP PALM & CYCAD NEWSLETTER No. 80**  
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**Membership matters :** Subs will be due on 1-7-99, still \$5 within Australia, \$10 overseas. It is best if overseas members send notes (US\$ or A\$), or cheques for several years at once. Don't send money orders, as bank charges eat up 90% of the value on \$10. Cheques are nearly as bad, on small amounts. If there is an x between the asterisks on the next line, my records have you as in arrears for '98-'99.

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**Weather & plant behaviour :** The lagging N.T. cycads finally got leaves, the *Cycas maconochiei* starting to flush on 6-2-99, & their leaves still look quite fresh. The *C. calcicola* leaves are almost entirely white already, so they only lasted 4 months this time, instead of 8 or so. My large *C. kennedyana* (media x *ophiolitica* ?) made no new leaves this season (except on the sucker), & nor did 4 out of 5 *C. megacarpa*. Brisbane had the 2 coldest April days on record this year, & when I checked around 7 a.m. it was 4 degrees C., so tropical plants have had an excuse to shut their shops early. As of today (May 21st.), all my gingers are dormant, & all *Amorphophallus* except for a couple of large *A. paeonifolius*. Usually they are at this stage a month later.

**Palms :** The revision of *Livistona* has been published in *Telopea*, but I haven't seen the article yet. Despite the cool conditions, most (15 out of 25) of the *Calyptrocalyx* sp. Mt. Lewis (= single-trunked "*Laccospadix*") have new red leaves ; nearly 1 metre leaves on plants with only 20 cm trunks as yet. The *Hydriastele wendlandiana* plants still seem to be making growth also. The largest *Livistona victoriae* has doubled in size this year, as have the larger *Livistona muelleri* & *L. fulva* (= sp. Blackdown Tableland) plants. Some *L. rigida* plants are still tiny, 1 or 2 leaves, although now 10 years old .

**Notes from your letters :** Irene Champion from Slade Point near Mackay reports *C. cairnsiana* doing well at her daughter's place (presumably nearby), with really blue new fronds which tend to go green as they age ; same here.

Mrs F. B. Bosworth from Ingham would like us to do more active studies, & feels I should publish a list of members & their addresses to facilitate this. Could anyone who does not want their address published, let me know, & I'll publish the rest. She writes "Amazingly, my *M. macdonnelli* is by far the best of my macrozamia. It seems to delight in 100 inches of rain a year." Mine also do very well, provided they are in full sun ; I had to move 2 which had a tree grow over them, as they stopped growing. The geologists reckon arid Australia was hot & wet a million years or so ago, & *M. macdonnelli* must have kept those genes going. The grey colour lasts well too, provided the plant is in plenty of sunlight. A female *C. media* in her yard for about 40 years "never does the same thing in consecutive years. It is completely unreliable." I dare not extrapolate about females in general. Her *Livistonas* were severely attacked by the grey-back cane beetle last year, but escaped this summer, & are recovering.

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A letter from Don Stallard contained some memories of Len Butt, & some comments on the "large" *Cycas armstrongii* I mentioned in newsletter no. 78. He agrees these are at the inland edge of the distribution of the species, & "therefore more than likely another so-called species or hybrid. As you correctly noted Hill has not listed the localities of some hybrids or recognised those occurring between *C. armstrongii/C. canalis* or *C. canalis/C. calcicola* (depending on the accuracy of the distribution boundaries), yet I know of at least 2 locations where this occurs. However I also recognise the enormous task involved in accurately mapping the distribution & overlap of these species to the point that whole areas of distribution are not indicated on the maps & may in some cases be new species." Don, currently based in W.A., has a second base in Qld. & much past experience of the N.T.

New member Jeanette Devlin spends a large part of each year at a mine near Forsayth (near Georgetown in north-east Qld), & recently sent me some nice photos of blue cycads from Robin Hood Station near Forsayth, where a new homestead has recently been constructed among the cycads without damaging any. These would probably be *C. cairnsiana*. She mentioned finding also a small colony of the giant & primitive fern *Angiopteris evecta* in a sandstone gully near Forsayth. A relic survival in that dry country, although common in some wet areas of coastal north Qld., & several Pacific islands.

**Cycad taxonomy from Holland** : I gained a couple of hours amusement from a review in the Dutch-dominated journal *Blumea* ; D.J. de Laubenfels & F. Adema-- A taxonomic revision of the genera *Cycas* & *Epicycas* gen. nov. (Cycadaceae) -- 1998 *Blumea* 43: 351-400. *Blumea* concentrates on Malesian (Malaya, Indonesia et al.) plants, & often their European authors rely on herbarium sheets only. In this case, my Qld. Herbarium contacts tell me the authors asked for no material (or info) from any Oz herbarium, & so far as is known neither has ever visited Oz. It shows.

They divide *Cycas* into 4 subgenera, all new, & a new Asian genus, *Epicycas*, with 30 *Cycas* spp. described, 2 of which are new. The last revision of *Cycas* prior to Ken Hill's recent work, most of which was probably published after their article was in press, was by Schuster in 1932, & was very muddled. They put several former *Cycas* spp. into *Epicycas*, plus 1 new one with a "subterranean bulbous stem base" (*E. sp. nov. 1*). The bulbous base is the main criterion in which *Epicycas* differs from *Cycas*. Other criteria are : "The pinnules, for example, are characteristically flat, rarely with even the slightest bend to the, often undulate margins, while those of *Cycas* mostly have bent or even revolute margins. In some species of *Epicycas* the pinnules (& comb teeth) are dichotomised (= with divided apices), a character unknown in *Cycas*. Where known, the pollen cones in *Epicycas* are tapering cylindrical, while those of *Cycas* are mostly ovoid."

I don't know these Chinese & S-E Asian species that they have put into *Epicycas* well enough to agree or disagree on a new genus. On inertia grounds I tend to vote no.

On the revision of *Cycas* proper, their treatment is downright peculiar from whoa to go, & one wonders if the Dutch have any idea of how big Australia (& S-E Asia) is. Cycads have large seeds, not easily dispersed (except by sea in some cases), so geography cannot be ignored. A similar problem often arises with field-averse botanists basing decisions only on herbarium sheets & published papers. A correct decision may require herbarium collections to cover all main areas for a species, & include the full range of variation for that species, plus any natural hybrids. In real life,

collections are usually sparse, money is limiting, & most variation is recorded poorly or not at all.

Their subgenus *Cycas* includes *C. circinalis* (India), *C. thouarsii* (Africa), *C. sphaerica* (India & Sri Lanka), *C. furfuracea*, *C. normanbyana*, *C. media*, *C. armstrongii*, *C. angulata* & *C. lanepolei*. Their *C. thouarsii* includes Sri Lankan material, to my surprise (but *C. thouarsii* seeds do float, unlike those of other spp. in that subgenus). Their *C. media* includes also *C. kennedyana* & *C. megacarpa*. Their *C. armstrongii* includes *C. papuana*, & they add "*C. armstrongii* could easily be treated as a variety of *C. media*." Their *C. angulata* includes *C. ophiolitica*, *C. platyphylla*, *C. couttsiana*, *C. brunnea*, *C. arnhemica*, *C. orientis*, *C. canalis* ssp. *carinata*, *C. desolata*, *C. badensis*, *C. maconochie*, *C. semota*, *C. tuckeri*, *C. yorkiana* & *C. pruinosa*. Their *C. lanepolei* includes *C. canalis* ssp. *canalis*, *C. sp. "Pine Creek"*, *C. conferta* & *C. xipholepis*. Their *C. normanbyana* includes *C. basaltica*, & their *C. furfuracea* includes *C. arenicola*. They state that *C. furfuracea* "is more or less intermediate between *C. calcicola* & *C. armstrongii*." A glance at a map indicates how geographically peculiar their lumping of species is. And had they ever seen the plants in the flesh, they'd be hard put to lump *C. conferta*, *C. basaltica* or *C. calcicola* in with anything else. The blue-green colour of *C. conferta*, the crowded pinnules, & the non-spiny petioles make it, for instance, totally distinctive. The authors have clearly been misled by David Jones' erroneous entry for *C. conferta* in his book "*Cycads of the World*", as they include both *C. conferta* & (the old name) *C. sp. Pine Creek*. Jones' book had a correctly labelled photo of *C. conferta*, but the adjacent description of *C. conferta* is actually that of *C. maconochiei*, & the correct description is given on p. 162 under the title "*Cycas sp. Pine Creek*". Both descriptions are quite poor; the *conferta* one omits the non-spined petiole & calls the distinctive bluey-green leaves just "light green to bright green, & the *maconochiei* one (p. 139) says the leaves are "bluish green to green". They actually emerge a remarkable variety of blues, with a rusty tomentum at first, then age to a dullish dark green. The "black trunk" mentioned is an artifact of bushfires, & the unburnt colour is buff to grey. Incidentally, the latest edition of Jones' book has a new cover & so on, but the text is uncorrected, despite myself (& I presume, lots of other people) advising Jones some years ago of this error.

Back to the Dutch. Their subgenus *Truncata*, with cylindrical trunks, includes *C. schumanniana*, *C. rumphii*, *C. scratchleyana*, *C. celebica*, *C. silvestris* & *C. edentata* (S-E Asia). Their *C. rumphii* includes Hill's *C. bougainvilleana*, & is found from Sulawesi to the Solomons, Micronesia & Christmas Island in the Indian Ocean. Their *C. scratchleyana* is found from the Moluccas across New Guinea to New Ireland, includes *C. apoa*, & is non-coastal, unlike *C. rumphii*. Anyone who has grown *C. apoa* knows it is distinct, quite apart from the ornamental undulant leaves (a trait which does vary). Their *C. celebica* is found from Borneo to Tonga, & includes *C. seemanii*, *C. neocaledonica*, & Hill's *C. micronesica* (in the Marianas). Hill put *C. celebica*, in the narrow sense, in with *C. rumphii*. It does have thornless petioles, unlike most forms of *rumphii*. Their *C. silvestris* includes *rumphii*-like plants from S-E Asia (Vietnam to Indonesia inclusive) as well as the northern Oz area. Their *C. edentata* includes *rumphii*-like plants from the Andaman Islands, thru Thailand & the Phillipines & Indonesia east as far as Timor. Their *C. schumanniana* includes most forms of Hill's *C. campestris*, all from upland New Guinea.

Their subgenus *Pectinata* includes *C. pectinata*, *C. taiwaniana*, *C. szechuanensis*, *C. campestris*, *C. javana*, *C. macrocarpa* & *C. riuminiana*. Their *C. pectinata* includes *C. multifida* of Chang & Zhong (Nepal, S. China & much of S-E Asia). Their *C.*

taiwaniana includes *C. hainanensis*, & comes from Hainan & the nearby coast of China. Their *C. szechuanensis* includes *C. guizhouensis*. Their *C. campestris* includes the type specimen of Hill's *C. campestris*, & is widespread in the lowland forest of New Guinea. Their *C. javana*, upgraded from Miquel's *C. circinalis* var. *javana*, comes from S Sumatra, Krakatoa & Java. Their *C. macrocarpa* comes from Peninsular Thailand & Malaysia, & seems to agree with other authors. Their *C. riuminiana* includes *C. chamberlainii*, & comes from the Philippines, Sulawesi & the Moluccas.

Their subgenus *Revoluta* includes *C. revoluta*, *C. taitungensis*, *C. wadei*, *C. immersa*, *C. beddomei*, *C. calcicola*, *C. pruinosa* & *C. cairnsiana*. Their *C. revoluta* & *C. wadei* seem conventional. Their *C. immersa* includes *C. panzhihuanensis* & *C. baguanheensis*, & comes from S China & Thailand. Their *C. beddomei* comes from India, & seems conventional. Their *C. calcicola* & *C. pruinosa* are conventional, but their placement in this subgenus might raise some eyebrows. Their *C. cairnsiana* is conventional, but they say "this poorly known species resembles *C. pruinosa*" but the latter may have "pollen cones .....(that are) much larger." *C. cairnsiana* is no longer a poorly known species.

Their new genus, *Epicycas*, includes *E. micholtzii*, *E. multipinnata*, *E. tonkinensis*, *E. sp. nov. 1*, *E. miquelii*, *E. elongata*, *E. siamensis* & *E. lindstromii*. I don't know any of these at all well. Their *E. multipinnata* includes *C. longipetiolata* of D.Y. Yang, & their *E. tonkinensis* includes *C. micholtzii* var. *simplicipinna* of Smitinand & *C. shiwandashanica* of Chang & Y.C. Zhong. Their *E. sp. nov. 1* includes Hill's *C. sp. "Saraburi"*. Their *E. elongata* includes *C. pectinata* var. *elongata* of Leandri. Their *E. siamensis* is *C. siamensis* of other authors.

The authors are clearly hard-core lumpers. Personally, I back Ernst Mayr's version of the species concept, where members of a species can (at least potentially) exchange genes, while non-members usually can't. Many cycads can form hybrids with several to many other species, & I presume this is because most species develop separately due to geographic isolation, without needing to evolve specific isolating mechanisms, unlike mobile species like birds, insects & plants with light pollen or spores. This ability to cross does not stop them being valid species, nor does a minor amount of gene flow between species in the wild. If populations of cycads are sufficiently different that there are criteria to tell them apart, & they don't overlap to any large extent with other populations, I favour calling them separate species on grounds of human convenience.

In some animals, a seemingly uniform species was found to consist of 2 or more non-interbreeding species on DNA evidence. Brown kiwis & some N Qld. rock wallabies are examples. Plants exist in an even wider range of situations. Some asexually reproducing species consist of multiple clones that may not have swapped any genes in thousands of years. Many seaweeds fit this pattern, & some ferns. An asexual *Backhousia* shrub from Gayndah propagates only by self-layering itself, & is known to be a *Backhousia* only because its essential oils are unusual, & closely match those of flower-producing *Backhousias*.

On the grounds of probability, the authors' groupings seem to me mostly unhelpful in showing similarities, & are often unlikely to reflect close genetic relationships, because of the lumping together of geographically widely-separated populations. Similar traits in many species can be explained by residual characters from remote ancestors (sometimes lost in close relatives), or by parallel evolution in different gene pools. Recent DNA evidence strongly indicates, for instance, parallel evolution in fruit & insectivorous bats, which appear to be genetically unrelated to

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each other. The genus *Cycas* has had a long history for evolution to act in, being probably the most primitive extant genus of cycad.