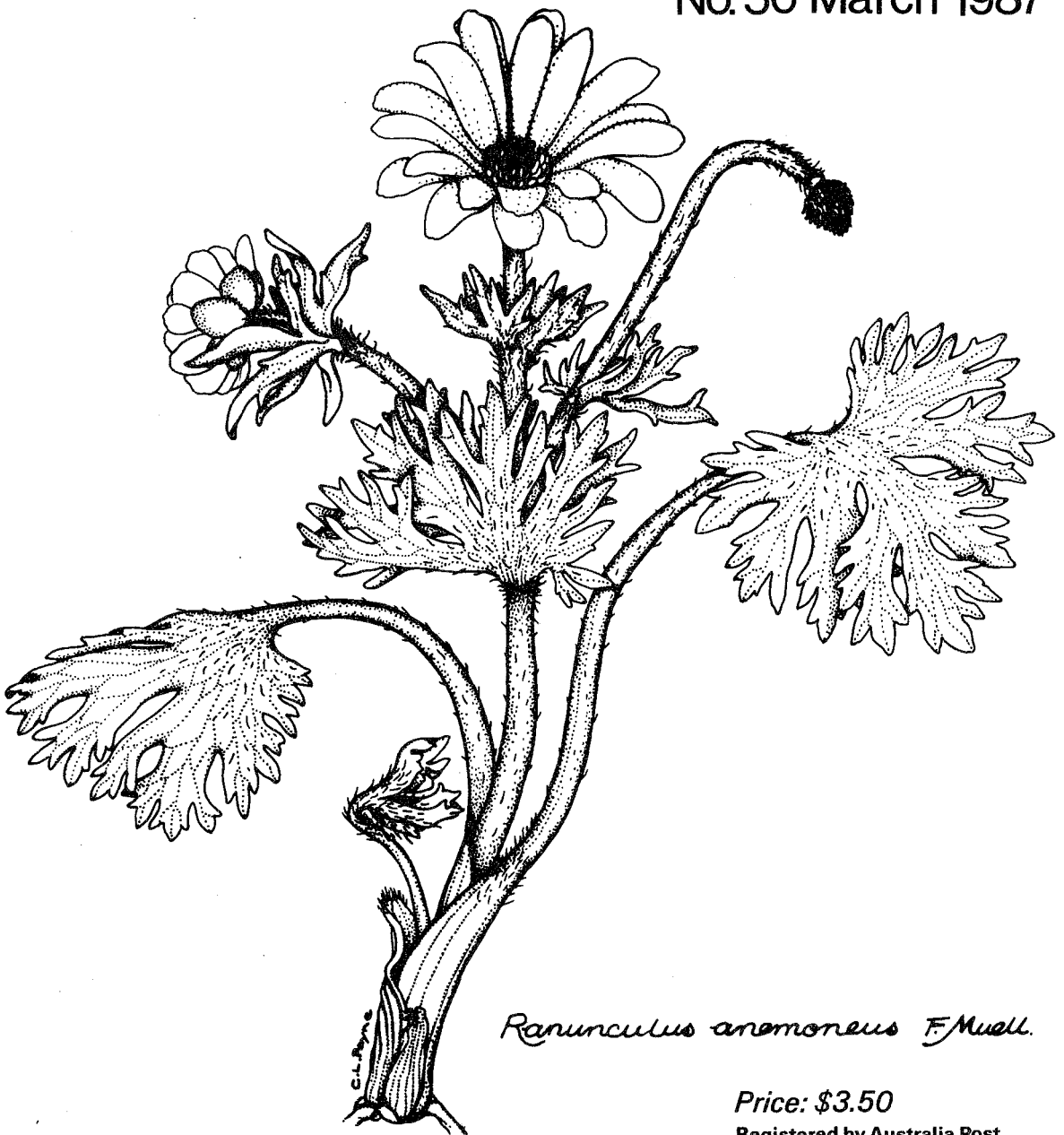




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THE GRASS TYPES OF KAREL DOMIN

B.K. Simon
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Whilst undertaking bibliographic work on the Flora of Australia account of the grass tribe Andropogoneae, it was necessary to examine types from Karel Domin's collections made in Australia in the period 1909-1910. In 1986 I requested a loan of type specimens from the Botany Department of the National Museum in Prague to be sent to Kew for personal examination there, the collecting information being extracted from Domin's Beitrag zur Flora und Pflanzengeographie Australiens. A reply was received from Dr J. Sojak, Head of the Department of Botany, in which he stated that "all types of genera Andropogon, Ischaemum and Rottboellia are not deposited in our herbarium. They may be in the Kew herbarium. The Domin types of Themeda and Cymbopogon have been sent to Kew."

The fact that only some of the material requested was located in PR and that none of the Aristida types, requested on loan a few years ago for revisionary work on the latter genus, despite being recorded as being in PR (Lazarides 1980), could be found there, provided an incentive for me to try and clarify the whereabouts of the Domin grass types not in PR.

When the Aristida types were first requested on loan to BRI in 1981 a reply was then received from Dr J. Sojak stating that Domin's material of Aristida was "not present and has never been deposited in our institute". He added "I regret to tell you that I don't know where they might be. It is not impossible that Domin left them by mistake in Kew or perhaps he sent them as early as before World War II to Hitchcock". An enquiry was sent to Mike Lazarides (then at Kew on an ABRIS grant) and passed on to Derek Clayton, who revealed that the Aristida type material had been studied at Kew by Dr C.E. Hubbard. It was also examined at Kew by Lazarides himself in 1966 after which it was returned, Clayton thought, to Prague. However, an examination of the photographs of the types taken at Kew revealed the specimens to be mounted on Leiden sheets but carrying Domin's own labels. Correspondence with Dr J.F. Veldkamp of the Leiden herbarium revealed that the types were indeed in L, having originally been sent to Henrard for his revision of the genus Aristida (Henrard 1926, 1927, 1928, 1933).

Whether the Aristida types were lent or donated to Henrard by Domin is not known. In his revision (p. 259) Henrard gives some of the facts behind the transfer of material as follows:- "Prof. K. Domin has placed his beautiful collection of Australian Aristidas at my disposal. I wish to express my sincere thanks to Dr H.P. Muller, Her Majesty's Ambassador of the Netherlands at Prague. By his personal influence the collection has been sent directly to the Department of Foreign Affairs, so I could use the plants for the second part of this revision". Two types however (those of A. pruinosa Domin and A. spuria Domin) were not located by Veldkamp in L; these names are to be neotypified. On the other hand the type of A. caput-medusae Domin was not seen by Henrard but is present in L. A number of type specimens were cited by Henrard as in "Herb. Domin, Praga" (those of A. jerichoensis (Domin) Henrard, A. longicollis (Domin) Henrard and A. praealta (Domin) Henrard) giving the impression the specimens were sent on loan. The Australian collections of Domin were kept separate and not incorporated into the National Museum in Prague before his death in 1953 (Kanis 1977), which further supports Dr Sojak's

contention that Domin's Aristida types have never been housed in the National Museum herbarium. The specimens that were sent to Henrard must therefore have come from Domin's private herbarium. No record of Domin's loans have been kept, however, to substantiate this view. With regards to the Andropogoneae types, of the specimens not included in the loan from PR, it transpired that most of these were represented at K. However, some were different from the Leiden Aristida types in that they did not have Domin's personal labels attached to the sheets. These may have become separated from the specimens, which are probably all of Domin's original material as Domin was not known to have distributed duplicates (Kanis 1977). How the specimens became part of the Kew collection I have not been able to discover, but possibly they were sent by Domin to Hubbard in much the same manner as the Aristida specimens were sent to Henrard.

Representative portions of three of Domin's Andropogoneae types (of taxa now included in Cymbopogon refractus) are also in Queensland Herbarium (BRI), presumably having been donated to S.T. Blake by Hubbard when the former was Australian Botanical Liaison Officer at Kew in 1964. Of these types, one (Andropogon refractus var. luxurians) is a complete specimen and carries with it an original Domin label, as does the specimen at K; it has been called an isotype by Blake and the K specimen the holotype. Another specimen (A. refractus var. luxurians f. euryphyllus) is the top portion of a culm and labelled by Blake as "piece of type" and "ex herb. Domin". In this instance both K and BRI specimens do not have Domin labels but there is at K a photo of a specimen with a Domin label, presumably the PR holotype but not located at PR in 1986. The third BRI specimen (A. refractus var. tropicus) is represented by the apical portion of two culms and also carries Blake annotations similar to those reported for A. refractus var. luxurians f. euryphyllus i.e. "piece of type" and "ex herb. Domin". No specimen was located at K under this name although again there is a photo at K of a presumed PR holotype not found at PR in 1986.

Although difficulty was experienced in obtaining loans of Aristida and Andropogoneae types from PR most of Domin's types are probably there. I had no trouble obtaining on loan two other consignments of other grass types (species of Panicum and Chloris) from PR to BRI in 1982 and 1984. However I feel a register of what Domin types relevant to Australian grasses, or indeed to all Australian plants, are present in PR (and possibly also the University of Prague herbarium (PRC) where Domin was Professor of Botany until 1939) as well as other European herbaria such as K and L would be a useful task for some future Australian Botanical Liaison Officer to undertake. Much time would thereby be saved in preliminary bibliographic investigation and correspondence.

ACKNOWLEDGMENTS

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PAPERS PRESENTED AT THE ESA/ASBS 1986 CONFERENCE

THE ECOLOGY OF AUSTRALIA'S WET TROPICS (Continued)

The geographic affinities of some north Queensland liverworts

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Even though the wet tropical areas of the world are known to support a rich and diverse flora, some plant groups such as the bryophytes have been so poorly collected that the extent of their diversity in these areas has been only a matter of conjecture. In the wet tropics of north Queensland, collections of liverworts have been made only on a casual basis and many areas are in need of attention. Generalizations concerning distributions as well as speculations on origin and migration of liverwort species within the Australasian area have been made without the inclusion of the Queensland wet tropics. While collection and identification is still incomplete recent work, including collections made in the upland rainforest area between Innisfail and Cape Tribulation, has revealed a rich liverwort flora. These preliminary results indicate that the affinities of the liverwort species from this area appear to be principally with the plants of the Indomalayan/Southeast Asian area with more than 60% of the rainforest species found in north Queensland also occurring in that area. With the Dividing Range providing an upland corridor to the south, Austral species might be expected to occur the length of the range in eastern Australia; however only 30% of the north Queensland liverwort species are also present in southern mainland Australia/Tasmania/New Zealand. Of these, 10% are not found north of Queensland. Many of the liverwort species in the north Queensland rainforest have ranges extending to India (39%), Africa (24%) and South America (13%). Also, of the 56 families identified from north Queensland, 30% are mainly southern hemisphere in their distribution. This element of the Queensland flora may represent a Gondwanaland derivative. The absence in the area of peaks with elevations above 2500 m has probably eliminated cool-adapted liverwort species. Even within Queensland, the liverwort floras of the south do not have a great similarity to those of north Queensland's rainforest. Of the plants on Windolf's (1986) list of liverworts of the Sunshine Coast of Queensland, only 20% are common to both areas.

The dispersal capabilities of liverwort spores have been little investigated, but the presence of 48% of the north Queensland species on Pacific islands suggests that at least some of the plants are capable of long-range dispersal. This dispersal capability along with past continental movements probably accounts for the large number of disjuncts in the flora. Also, endemism among the liverwort species is relatively high (20%); however this may be partly a reflection of taxonomic inconsistencies.

These collections, while based on preliminary information, indicate that the liverwort flora of the wet tropics of north Queensland has three components: (1) Gondwanan derived plants (2) Laurasian derived plants and (3) plants that have evolved within the tropics. As a result, this flora, which is tropical in character, has a greater affinity to the liverwort floras of the paleotropics than to the southern temperate Austral floras.

MORPHOLOGY OF SOME AUSTRALIAN MONIMIACEAE (s.l.)

Donald B. Foreman

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With a general renewal of interest in the phylogeny of the angiosperms as a whole, detailed studies on groups such as the Monimiaceae (s.l.) are essential to our understanding of relationships within basal orders such as the Laurales.

In recent years there has been a great deal of interest shown in the Monimiaceae particularly since the classical work of Money, Bailey and Swamy (1950). However, many of the Australian Monimiaceae remain relatively poorly known.

A total of thirteen species in eight genera of which more than half are confined to the rainforests of north-eastern Queensland were included in this study.

Nearly all modern-day systems of phylogenetic classification of the angiosperms treat the Monimiaceae (s.l.) as one family with a number of sub-families, viz. Hortonioideae, Monimioideae, Mollinedioideae, Atherospermatoideae and Siparunoideae. There is now some argument about such a treatment with an increasing amount of evidence indicating that the Monimiaceae (s.l.) should be split into 3 or even 4 separate families. This study primarily looks at evidence to support the recognition of the Atherospermataceae as a separate family.

Aspects of wood anatomy, floral morphology, anther morphology, pollen production and morphology have all been studied in detail particularly where there have been conflicting reports in the literature. Generally, characters which may be or are known to be of phylogenetic and/or taxonomic significance have particularly been selected for study.

The study of wood anatomy confirms the place of the Monimiaceae (s.l.) amongst the putatively primitive angiosperms. Following well-established ideas on evolutionary trends, the secondary xylem of the Atherospermataceae can be clearly separated of other members of the Australian Monimiaceae.

Previously many authors had used terms such as "raceme" and "raceme-like" to describe the inflorescence structure of members of the Monimiaceae; they are in fact all cymose. They appear to have followed a similar pattern of development to that described by Johnson and Briggs (1979) for the Myrtaceae.

Flowers of many of the Monimiaceae have become highly specialized and some have developed a hyperstigma. In contrast, the flowers of the Atherospermataceae are all relatively unspecialized.

The anthers of the Atherospermataceae are all bisporangiate, have valvular dehiscence, glandular staminal appendages and few wall-layers (3-5). This combination of characters was not seen in any of the other Australian Monimiaceae examined.

All members of the Atherospermataceae examined have been found to have an unusual type of modified simultaneous cytokinesis of the microspore mother cells resulting in the formation of a high proportion of tetrahedral microspore tetrads.

In contrast, other members of the Monimiaceae in Australia examined all have microspore mother cells which undergo the successive type of cytokinesis resulting in a high proportion of isobilateral and decussate microspore tetrads being formed. The pollen of most species is released as single grains in the 2-celled condition. Occasionally 3-celled pollen

grains have been seen in members of both the Monimiaceae (s.str.) and the Atherospermataceae. Hedycarya angustifolia sheds pollen in permanent tetrads, apparently as an adaptation to wind pollination.

The pollen of members of the Atherospermataceae is gemmate, medium-sized, isopolar, globose to globose-elliptic. The pollen is either dicolpate or meridionosulcate, not disulculate as indicated in some earlier reports. The exine is tectate - columellate with an uneven foot layer.

All members of the Monimiaceae in Australia examined appear to have pollen which is inaperturate or in some cases omniaperturate and vary more than the pollen of Atherospermataceae in their ultrastructure.

Unusual exine structure such as that reported by Kubitzki (1981) in some species of Hernandiaceae and Lauraceae, have not yet been found in any of the Monimiaceae/Atherospermataceae examined.

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EVOLUTION IN THE XANTHOSTEMON SUBALLIANCE (MYRTACEAE)

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This paper presents the results of a preliminary cladistic analysis of the Xanthostemon suballiance, an informal taxon set up by Briggs and Johnson (1979). It is a monophyletic group characterised by the common occurrence of at least two derived character-states (synapomorphies), viz. placenta elongated, erect or protruding into the loculus, and flattened seeds containing embryos with relatively broad, flat cotyledons lying face to face and with an accumbent hypocotyl. As well as these, most, if not all, the species have a broad anther connective, a distinctive fruit shape (although this may be an unspecialised character-state), alternate juvenile phyllotaxy, oil glands in the bark and pith, a hypodermis, and characteristic pollen (Gadek & Martin 1981); these, however, are not necessarily unique to the suballiance and further investigation is required.

Three or four genera have been recognised in this suballiance. Xanthostemon F. Muell. is a predominantly tropical genus of at least 45 species that occurs in Australia, New Caledonia, the Solomons, New Guinea, the Moluccas, Sulawesi and the Philippines; only one species, X. oppositifolius, is found outside the tropics. The current broad concept of the genus includes species with a range of variation in placenta angle, with both opposite and spiral adult phyllotaxy, and two species

with winged seeds. Gugerli (1940) divided the genus into 5 Sections but these do not adequately accommodate the range of variation now known to exist.

Nani Adans. has generally been considered congeneric with Xanthostemon but a few authors have argued for its maintenance as a separate taxon on the basis of its opposite adult phyllotaxy. Purpureostemon Gugerli is a monotypic genus from New Caledonia segregated for its oblique, basally inserted placenta and its winged seeds. Pleurocalyptus Brongn. & Gris is also a monotypic genus from New Caledonia, distinguished by its calyptrate calyx.

Previous work on these genera by Dawson (1972) has suggested that further study could lead to them being merged. The present study has set out to test the soundness of this suggestion. Seventeen morphological characters were used to construct phylogenetic trees linking 14 terminal taxa which include all the segregate genera plus other species or species groups. Character polarisations were determined largely by the outgroup method; however, since it is not clear what the sister-group of the suballiance is, the data of Johnson & Briggs (1985) for the whole family were used as a guide. The data were subjected to cladistic analysis using programs from Felsenstein's PHYLIP package. Equally parsimonious alternative trees were examined and character re-assessments made to clarify presumed homologies. One result of this was to indicate that the winged seed of X. crenulatus and X. eucalyptoides is not homologous with the winged seed of Purpureostemon ciliatus.

The resulting cladograms show only two robust groups; the first is characterised by the occurrence of red flowers, a character-state not readily testable for homology, and the second is a group of three taxa from New Caledonia, made up of Pleurocalyptus and two of Gugerli's Sections, which share three synapomorphies. This implies that Pleurocalyptus does not warrant separate generic status since it is no more than a specialised member of a monophyletic group.

Another conclusion is that there is no justification for a separate genus to accommodate the species with opposite leaves; this condition seems to have arisen independently a number of times. In fact, on the basis of the data analysed, there is no sound basis for the acceptance of segregate genera but more characters need to be included in the analysis to clarify questions that still remain.

If the geographical distributions of the various species groups are superimposed on the cladogram, it can be seen that the taxa with the fewest derived character-states (apomorphies) occur in Australia and areas that would have been at the northern edge of the Australian Plate. On the other hand, many of the more advanced taxa occur in New Caledonia as well as in Australia, and this implies that ancestors with more specialised character-states had already arisen by the time New Caledonia became isolated from the Australian Plate, and that these evolved rapidly under the unique edaphic and climatic conditions there.

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PRELIMINARY STUDIES ON THE SEMATOPHYLLACEAE (BRYOPSIDA)
FROM NORTH QUEENSLAND

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As a family, the Sematophyllaceae, particularly the large subfamily Sematophylloideae, is considered taxonomically difficult (Iwatsuki 1981). This is summed up very clearly by Buck & Vitt (1986) who state: "No recent authors have had the knowledge or courage to work on the family in a comprehensive way. There is a strong need for a generic revision".

Some progress has been achieved on a regional basis, for instance in Japan (Seki 1969, Nishimura et al. 1984 who transferred several to the Hypnaceae). Studies on individual genera or species have been carried out in several geographical regions (Iwatsuki 1977, Buck 1982, 1983a,b,c, 1984) but there has been no revision of Australian members of the family. Scott and Stone (1976) record ten genera and 36 species for the family to which Stone (1982) has added four new taxa.

Historically the family has been placed in the sub-order Hypninae of the Bryopsida and divided into four subfamilies, Clastobryoideae, Heterophylloideae, Sematophylloideae, and Macrohymenoideae by Brotherus (1925). Later studies have increased the number of genera in the family from the 36 recognised by Brotherus to 52 (Vitt 1982, 1984) or 53 (Buck 1982), the increased number being a combination of splitting of some large genera such as *Sematophyllum* and *Rhaphidorrhynchium*, and the discovery of new genera (Iwatsuki & Noguchi 1971) from previously unexplored tropical areas, for instance Central and South America, and from Japan. Regional lists illustrate the family's pantropical distribution: Philippines 20 genera (Bartram 1939, Iwatsuki & Tan 1977); Madagascar 16 genera (Crosby & Schultze-Motel 1983); New Caledonia 15 genera (Pursell & Reese 1982); New Guinea, at least 15 genera (Bartram 1943-61, Streimann 1983, Norris & Koponen 1985) while Great Britain and Ireland have one genus (Smith 1978) and Eastern North America 6 genera (Crum & Anderson 1981). In the Australasian region, Sainsbury (1955) records two genera and nine species while Scott & Stone (1976) list ten

genera and 36 species for Australia. All the New Zealand taxa are present in Australia. All genera, other than Sematophyllum, Rhaphidorrhynchium and Wijkia (Crum 1971) which are present in Australia and New Zealand, are mainly tropical forms occurring only in Queensland. Stone (1982) reported four new records for Queensland, Pseudohypnella verrucosa, Taxithelium nepalense and as yet unidentified species of Tristichella and Clastobryum, while Thiers (pers. comm.) reports Tristichella spiculifera Dix. and Clastobryella sp. from her recent collections.

Taxonomic position of the family Sematophyllaceae

The majority of genera in the family Sematophyllaceae (35 out of 53 Buck (1982)) have four or fewer species, thus the family is unusual among related pleurocarpous mosses which have fewer but larger genera. In a recent analysis of the classification of pleurocarpous mosses, which includes cladistic approaches and phylogenetic methods Buck & Vitt (1986) have placed the Sematophyllaceae in a new category or superfamily, Hypnacanae Buck & Vitt. Within this superfamily, two families Entodontaceae and Sematophyllaceae are considered the oldest, being tropical, while the temperate families are considered more recent in origin. In comparison with the pleurocarps generally, however, family Sematophyllaceae is thought to be more recently derived (Buck 1982) with many apotypic character states (Vitt 1984).

Whilst there is a close relationship between the families Hypnaceae and Sematophyllaceae, many find the relationship difficult to define. Seki (1969) transferred seven genera from the Sematophyllaceae to the Hypnaceae. Nishimura et al. (1984) accept Giraldiella, Glossadelphus and Heterophyllum as belonging to the Hypnaceae but the other four genera, Brotherella, Wijkia, Clastobryella and Taxithelium require further study. Both these publications deal mainly with Japanese taxa. Only two of the genera under review in terms of family status, Wijkia and Clastobryella, have been recorded from Australia and Glossadelphus is the only genus found here which was transferred from the Sematophyllaceae. Crosby et al. (1985), however, feel that the distinctions between Sematophyllaceae sens. lat. and Hypnaceae listed by Nishimura et al. (1984) do not exclude Glossadelphus from Sematophyllaceae. The character they considered significant, the presence of collenchymatous exothecial cells, is a character which can be quite variable. Robinson (1971, 1986) argued a case for a close relationship between the Hookeriaceae and Sematophyllaceae which was rejected strongly by Buck & Vitt (1986).

It is not the aim of this study to solve the overall problems of the family and generic delimitations but any revision must take problems of individual genera into account.

The family Sematophyllaceae in Australia

There are 16 genera, including Glossadelphus, and 47 species recognised in Australia at present (Wijk et al. 1959-69, Streimann in press) of which almost 70% (33) have a mainly tropical-subtropical distribution and occur in northeast Queensland. The majority of the Queensland representatives are restricted to north Queensland (22) of which 77% (17) are endemic to the area. Five of the sixteen genera are represented by a single species. There are 17 endemic species.

The non-endemic Australian species are mainly distributed in southeast Asia (36%) and Oceania (19%) with a similar number (19%) in New Zealand. Fewer species are common to America or Africa (10%) and only a few have a pantropical distribution; north Queensland is therefore the centre of diversity for the family in Australia. All Australian genera are represented by at least one species in the region and the degree of

species endemism is high (36%). The greatest species concentration is in the wetter high altitude forests, but some species occur wherever suitable microhabitats are present, e.g. in wetter gullies. Species form dense or loose mats, sometimes robust and extensive e.g. Wijkia extenuata, but often small and inconspicuous, e.g. Glossadelphus, Clastobryum. The family is epiphytic on tree bases, fallen logs, trunks or more rarely on small branches of trees or shrubs as well as on soil humus or rock.

Taxonomic confusion is mainly associated with the two large genera Rhaphidorrhynchium (7 sp.) and Sematophyllum (11 sp.). Scott & Stone (1976) did not recognise Rhaphidorrhynchium, placing all taxa from this genus into Sematophyllum. Seki (1981) used data from the principal components analysis of 39 characters from previous work (Seki 1969) to place two new species of Rhaphidorrhynchium in Japan on to a scatter diagram of the genera in the family (Fig.4 p.245 Seki 1981). He suggests that Scott & Stone's (1976) placing of Australian Rhaphidorrhynchium species in Sematophyllum may be too wide a concept with reference to his diagram which clearly separates the two. A similar analysis of Australian species is required. There are 146 names associated with Australian collections including all variations for individual species.

All subfamilies recognised by Brotherus (1925) and Fleischer (1915-22) are represented in the Australian genera but the majority of genera are in the Sematophylloideae (66%). The Clastobryoideae are the most modified and have asexual reproductive mechanisms (gemmae or flagelliferous branches) (Buck & Vitt 1986). A re-evaluation of the genera and species in this subfamily by Tixier (1977) arranged them in relation to peristomial morphology. The report by Ilma Stone (1982) of Clastobryum and Thiers specimen (NY) of Clastobryella are the first records for this subfamily in Australia.

Problems to be solved

The initial problems are in defining genera. A key to resolve these for Australian taxa is being prepared. Without this, unnamed herbarium collections will continue to remain undetermined even to genus. Full descriptions and illustrations are available for only some of the species and there are some 20 *nomina nuda*. Very few chromosome numbers are known for Australian Sematophyllaceae and none for the north Queensland taxa. For a number of species we have only type collections, many lacking data on sporophytes and often consisting of a few shoots, e.g. Glossadelphus dimorphus.

Techniques which should assist in clarifying generic and specific relationships include cladistic and scanning electron microscope studies in addition to the standard light microscope examinations. Structures such as pseudoparaphyllia (Ireland 1971), papillosity of peristome teeth, sexuality and spore surfaces have not been considered in earlier works. Establishment of evolutionary trends will require comparisons with related groups.

Why is north Queensland an important study region?

As north Queensland is the centre of diversity for the family in Australia detailed studies on the taxa in this region should provide valuable clues to the evolution of this family in the Australasian region. The phytogeographical importance of north Queensland has been clearly demonstrated for higher plants (Keto et al. 1986, and the recent ESA-ASBS Symposium on the Australian Wet Tropics (proceedings in press)). Bryophyte taxonomic studies can also contribute to our understanding of evolution and relationships of the Gondwanic, Laurasian and Australasian

elements present here. The Sematophyllaceae with its tropical affinities is therefore a family of importance for study in the wet tropics of north Queensland.

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NOTES

NICOTIANA: LOST LIST LOCATED

D.E. Symon c/o State Herbarium, Botanic Garden, Adelaide
and V. Hansen, Southedge Tobacco Res. Stn.,
P.O. Box 174, Mareeba Qld 4880

During the 1950s when Dr. N.T. Burbidge was working on the Australian species of Nicotiana she received seed from many sources. The seed was given Tobacco Seed (T.S.) numbers from 1 to 368. Plants were grown under these numbers and reference is made to some of them in her revision of Nicotiana, Aust. J. Bot. 8 (1960) 342-380. In addition herbarium specimens were distributed with these numbers. Dr. Burbidge gave no clue to the T.S. numbers and a recent letter to C.S.I.R.O. Div. of Plant Industry failed to locate the list.

It was later learned that the Southedge Tobacco Research Stn., Mareeba, had received the bulk of the C.S.I.R.O. tobacco seed collection and enquiry there (by D.E.S.) received the response (from V.H.) that they did in fact have the list "in an advanced state of disintegration ... notes were made in a combination of pencil, ink and biro, some over the top of each other".

We have made an effort at transcribing the list and copies will be lodged with the principal Australian herbaria to go with their Nicotiana collections if they so wish. It is not clear whether the names given the collections were tentative or final, and since they were often given to seed said "not to germinate", they may best be taken as tentative rather than definitive.

WESTERN AUSTRALIAN RECORDS OF NATURALIZED FLORA
TREATED IN FLORA OF AUSTRALIA

Greg Keighery

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The purpose of this note is to place on record Western Australian occurrences of a variety of naturalized species treated in the Flora of Australia, and recorded only for Eastern Australia.

Most of these taxa are known from only a few sites, and can be subject to rapid change in status, facts poorly recorded on herbarium labels. Normally each vouchered site is photographed, the population described (with special reference to its biological features) and subsequently monitored over 5 year intervals. These records are forming a data base on actual and potential weeds affecting conservation areas (or other land uses) managed by my department. Material from these records are used to inform managers of these problem species (Keighery 1986, a, b, and c).

Authors revising naturalized species for the Flora, especially when garden escapes are involved, are welcome to request information that may aid their deliberations for the Western third. An annotated list of W.A. records follows (specimens at PERTH, unless otherwise noted, but duplicates of many collections may have been distributed).

Briggs, B.G. (1982) Tamaricaceae Flora of Australia 8 : 110-112.

Tamarix aphylla (L.) Karst.

This species is established along the banks of the brackish Avon River (at Toodyay, G. Keighery, 7752).

Rodd, A.N. (1982) Salicaceae Flora of Australia 8 : 201-202

Populus alba L.

Sterile suckering clones occur along creeks, eg. Claise Brook, Perth (G. Keighery, 6020); Australind (Keighery sn, KP); Albany (G. Keighery, 9032); Shannon River (Keighery, 9417).

Hewson, H.J. (1985) Simaroubaceae Flora of Australia 25 : 188-196.

Ailanthus altissima (Miller) Swingle

This species is well established in older Perth suburbs; especially Subiaco (G. Keighery, 6373) where it is a proclaimed noxious weed (Keighery, 1983). Subsequent development of this region is reducing the number of vacant blocks and unsealed lanes and this species is declining in abundance.

Hewson, H.J. (1985) Melianthaceae Flora of Australia 25 : 1-2.

Melianthus major L.

Occurs sporadically on limestone soils on the Swan Coastal Plain as an established Garden Escape (Australind, G. Keighery, 3854).

Jessup, L.W. (1985). Anacardiaceae Flora of Australia 25 : 170-187.

Schinus molle L.

Population 5 km W. of Wellington Mills (G. Keighery, 7068), documented in Keighery (1986, a).

Schinus terebinthifolia Raddi

A very large population of this species occurred on farm land and commonwealth reserve at Navel Base (sthn. suburb of Perth, G. Keighery, 4459). This region has since been developed for housing and this population faces extinction.

Cooke, D.A. (1986) Iridaceae Flora of Australia 46 : 1-65.

Crococsmia x crocosmiiflora (Lem. & Morren) N.E.Br.

Well established in disturbed creeks or wet areas, records from Pemberton (G. Keighery 4487), Northcliffe (G. Keighery 4480), Denmark (G. Keighery 6517) and an old record from Albany (J. Paterson 767/62) where it still occurs.

Pedley, L. and Forster, P.I. (1986) Agavaceae Flora of Australia 46 : 71-88.

Agave americana L. var americana

This variety is commonly found around old houses or settlements. Large populations are found on dunes at Dongara; on the escarpment of Mt Eliza, Perth (G. Keighery, 2276), on Rottnest Island (G. Keighery, 8136) and at Israelite Bay (Wace ANU 13112).

Agave americana var expansa (Jacobi) H. Gentry

This variety is established on Rottnest Island (G. Keighery, 8137); and is documented in Keighery (1986, b).

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Keighery, G.J. (1986, b) Garden Escapes on Rottnest Island; An Annotated Checklist. Landnote 3/86.

Keighery, G.J. (1986, c) A Data Source Booklet on Western Australian Members of the Rosaceae and Chrysobalanaceae. Landnote 1/86.

JOSEPH BANKS AND NEW ZEALAND FLAX

Margaret Stones

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The once thought "lost" portrait of Joseph Banks, aged about thirty, by Benjamin West (1738-1820), has been exhibited again in London at the Royal Horticultural Society's exhibition entitled "The Glory of the Garden" (Sotheby's 1987), after a gap of 125 years since the picture's last public appearance, at the International Exhibition at South Kensington in 1862. The full length portrait was painted shortly after Banks' returned triumphant to England, having completed a circumnavigation of the globe on Cook's First Voyage (1768-1771). The

painting was exhibited at the Royal Academy in 1773, and in the same year, a mezzotint plate, based on the painting, was engraved by J.R. Smith.

The portrait celebrates Banks' Pacific discoveries, and in particular, it appears to champion products made from the newly discovered plant, New Zealand flax (Phormium spp.), in which Banks placed considerable faith as a commercial alternative to European flax (Linum spp.). In the portrait, Banks wears an impressive Maori cloak, finely woven from Phormium fibre, and he quite emphatically points to the elaborate border. Banks is surrounded by Polynesian weapons and other artefacts, many of which likely incorporate Phormium cordage. However, the singularly odd feature of the painting is found in the lower right corner; there sits a Solander box of loose drawings, presumably by Sydney Parkinson, the young artist commissioned by Banks to draw plants collected on the voyage.

What is odd is that the visible drawing is of a yellow-flowered species of Phormium. Parkinson prepared only pencil sketches of Phormium tenax (red-flowered) and of a Phormium species which he noted had flowers "straw coloured"; however, he never completed the drawings as he died later on the voyage. Banks employed several artists in London to complete Parkinson's unfinished drawings, and these with Parkinson's sketches survive in the British Museum (Natural History). The finished drawing of Phormium tenax is by F.P. Nodder and is dated 1783, but there is no finished drawing extant for the yellow-flowered species, which strangely features as such in West's portrait, nor is one recorded in the manuscript catalogue maintained by Banks' amanuensis Sigismund Bacstrom. The implications of this are not altogether clear. Possibly Banks wished so strongly to have a Phormium image included in his portrait, that he instructed West to reproduce, on the canvas, a completed version of the Parkinson sketch of the yellow-flowered Phormium species. Another remote possibility is that an original finished drawing did once exist, but is now lost. This tantalising thought stems largely from the fact that Banks, in 1795, sent to Empress Catherine II of Russia a collection of plants, specimens, drawings and engravings, and in a letter from Banks to James Bland Burges dated 4 July 1795, he mentions the inclusion of a drawing of New Zealand Flax (Carter 1974).

ACKNOWLEDGMENTS

I should like to record my thanks to Mrs J. Diment of the B.M. (N.H.) and Dr. Rick Willis of Melbourne C.A.E. for their kindness in giving me their professional advice and for re-drafting my prose.

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PUBLICATIONS

RECENT PUBLICATIONS OF INTEREST

David R. Murray (ed.). Seed Dispersal. Academic Press, Marrickville. \$56.00

Blanche Henrey. Thomas Knowlton: botanist. BM, London. c. \$35

Patrick Goode & Michael Lancaster (eds). The Oxford Companion to Gardens. Oxford, South Melbourne. \$95.00

Patricia Hutchings & Peter Saenger. Mangrove Ecology. Uni Qld Press, St Lucia. \$34.95

Alfred W. Crosby. Ecological Imperialism. The Biological Expansion of Europe, 900-1900. Cambridge, Oakleigh. \$19.95

Geoffrey C. Ingleton. Matthew Flinders: Navigator and Chartmaker. Hedley, Ivanhoe. \$195.00

Gullman, Götz & Gröner. Cacti. Alphabooks. \$69.95

E. Conabere. Australian Country Women's Diary. Collins, Melbourne. \$39.95

E. Butel. Margaret Preston. Penguin, Melbourne. \$19.95

Pierre Redoute. A Redoute Treasury. Dent, Melbourne. \$110.00

Frances Bodkin. Encyclopaedia Botanica. A&R, Sydney. \$60.00

David Liddle & Margaret Baker. Blue Mountains Wilderness. Megalong, Leura. \$39.95.

BOOK REVIEWS

Australia's Brilliant Daughter, Ellis Rowan by Margaret Hazzard: Greenhouse Publications, Richmond Victoria, 1984. 160pp + 27 B & W plates & 8 in colour.

The late Victorian period produced a number of extraordinary wilful, adventurous women who carved out careers for themselves often to the chagrin of their male chauvinist relatives. Amalie Dietrich, Daisy Bates, Marianne North and Ellis Rowan were amongst them. Ellis Rowan tramped New Zealand, Australia, New Guinea, and the U.S.A. furiously painting flowers, landscapes, birds of paradise and butterflies, mostly under primitive conditions. This book documents her often scrappily recorded life. However, I found the author extremely irritating. Her heroine is forever "a delicate woman" with "fragile charm" when in fact she must have been as tough as wire; she would not have searched for Erica in the Grampians; the Royal Botanic Garden, Kew is repeatedly the jumble Royal Kew Garden Herbarium; when her husband to be is shooting up the Maori and transporting them to Chatham Island it is high "adventure" but when the Maori fight back it is "massacre in dreadful fashion"; parties are "scintillating" and so on.

Ellis Rowan's greatest botanical contribution may well be the 570 illustrations (both coloured and black & white) done for 3 volumes on American trees and plants with Alice Lounsberry when she was under the discipline of a botanist. The author seems quite unable to distinguish between a botanical artist and a flower painter and is pained when Ellis Rowan wins gold medals at Colonial and International Exhibitions and is then turned down by Ashton, Lindsay, Gruner, Rubbo etc. Nowhere are there any critical assessments of her artistic strengths and weaknesses; nowhere is there a coherent list of where major collections of her work are held or even a start at a catalogue. At the end of her life, after innumerable exhibitions at which her pictures seem to have sold well, she had nearly 1000 paintings for sale. The author seems more concerned with who was who, social life at The Cottage and Debrett and so gives a somewhat unbalanced account of this remarkable, talented and fiercely industrious woman who deserves a better biography.

D.E. Symon

The European Garden Flora by S.M. Walters et al. Cambridge University Press, 1986. 28 x 22 cm. pp.445. Rec. Price \$A196.50 (hard-cover)

Volume 1 of this important horticultural work appeared last year; it covers the Pteridophyta (ferns, clubmosses etc.), Gymnospermae (cycads, conifers etc.) and Monocotyledons Part I - excepting the grasses, sedges, aroids, bromeliads and orchids which will be treated in the next volume. The stated objective (Introduction p.xi) is "to provide a scientifically accurate and up-to-date means for the identification of plants cultivated for amenity in Europe (i.e. it does not include crops --- or garden weeds)", and this Flora is hoped to meet the needs of both informed amateur gardeners and professional plant taxonomists. Reliability and excellence are guaranteed by the editorial team of ten professional British and Irish botanists, and there are 33 contributors to Volume 1 - all specialists in the British Isles.

A preliminary step was compilation of a "Commercial List" from all available nursery catalogues throughout Europe, and this resulted in 12,000 specific names upon which the present Flora is based. Two levels of treatment are used: most included species have full entries (being keyed, numbered and adequately described in the text), while less commonly cultivated species are given no number but briefly discussed under those full-entry species to which they will also key out. Widely grown cultivars are dealt with. Plant families follow the taxonomic system of Engler & Prantl, as expressed in H. Melchior's Syllabus der Pflanzenfamilien (edition 12, 1964).

Ferns are arranged in three artificial groups based on frond morphology, with keys to genera under each group; but a key is provided to gymnosperm and monocotyledonous families, to genera for each family, and to all numbered species under every genus of more than a single representative. Each genus is described, with indication of the number of constituent species, its world range and a selection of significant literary references. Distribution is also given for every species, important illustrations cited and a statement of hardiness provided - there are seven categories, according to severity of minimum temperatures

during winter. One may be concerned at the total omission of common names, but the editors (Introduction p.xii) draw attention to "the difficulties of providing vernacular names in all the necessary languages (not to say dialects)".

Some idea of the scope of this Flora is obtainable from its inclusion of 93 species of Iris (37% of the 250 known), 52 of Lilium (about half the 100 or so) and 36 of Abies (more than half). It is a surprise to find all four species of Australian Blandfordia and our two Doryanthes included, also that some figures are cited from the recent Encyclopaedia of Australian Plants by Elliot & Jones (1982). But, on the whole, Australian vegetation is not at all prominent - doubtless a reflection on the frost-tenderness of so many species and the inimical effect upon others of such low light intensity during European winters. It will be interesting to see how grevilleas, acacias and eucalypts fare in succeeding volumes. Several of the subjects treated, e.g. monocotyledons Allium triquetrum, Asparagus asparagoides, Crocsmia crocosmiiflora, Homeria miniata, Romulea rosea, Sisyrinchium iridifolium, Sparaxis grandiflora and Watsonia bubillifera, are serious weeds in many parts of Australia, but they would seem to be much less assertive under the European environment.

Ferns have been bountifully portrayed, by means of silhouettes, but the much larger section on seed-bearing plants is very sparsely illustrated. A glossary of terms and good 28-page index complete the volume. In some instances English words replace the usual Latin-based adjectives; thus, throughout the descriptive text, "hairless" is employed instead of glabrous and "leathery" for coriaceous. The book is well set-out, with pleasing type and three columns of text per page. A freedom from typographical error bears witness to meticulous proofing.

The statement (p.3, lines 6&7) that PSILOPSIDA "contains the single family Psilotaceae, which contains a single genus" ignores the existence of Tmesipteris and its half-dozen Australian species. Hypolepis "rugulosa" (p.39) is a mistake for H. rugosula (as originally and deliberately spelt). The description under Asplenium nidus (p.43) probably applies to the related and much more widely cultivated species, A. australasicum.

Distributions for species are italicized, and a few of these are incomplete, for example: Adiantum aethiopicum (p.21) is not restricted to the "tropics and subtropics", as indicated, being abundant in temperate Australasia; Azolla filiculoides (p.67) is not confined to tropical America, but flourishes in many parts of temperate Australia; in Araucaria heterophylla (p.73) and Cordyline baueri (p.289), Norfolk Island is erroneously bracketed as part of New Zealand; under Araucaria cunninghamii, N.S.W. should be included after Queensland; South Australia and Victoria should be added to the "SW" range accorded Orthrosanthus multiflorus (p.373).

Such casual imperfections in no way detract from the value of this fine production which is worthy of a place in any botanical library. However, its rather limited use in Australia and quite high cost (\$A196.50) will undoubtedly make an individual student balk at subscription

J.H. Willis

ABLO

AUSTRALIAN BOTANICAL LIAISON OFFICER VISITS TO EUROPEAN HERBARIA

I will be visiting Leiden (L), Paris (P), Geneve (G), Vienna (W), Berlin (B) and Lund (LD) between May and August this year. Botanists who would like type material examined and/or photographed at the above institutions should notify me by letter before 10 May 1987.

Enquiries for each taxon should include:

- i) the name of the taxon and its author
- ii) its currently accepted name(s) and synonyms
- iii) its place of publication
- iv) its type(s) or type citation (including country if from outside Australia)
- v) herbarium where type material is housed (refer to Taxonomic Literature vols. 1-6)

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STOP PRESS

BOTANICAL HISTORY SYMPOSIUM

We remind potential speakers that we wish to receive abstracts of papers and posters by May 31 - this year.

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Symposium Committee

MORE ON THE JOSEPH BANKS PORTRAIT

Geoff Maslen, in an article entitled "The flowers that bloomed for Banks", reported on the portrait which Margaret Stones wrote about, (see p.14). This article appeared in the Arts & Books column of The Age, 7th March, 1987. Subsequently, Gordon Guymer sent the newspaper clipping (below) from The Times.



THE TIMES THURSDAY MARCH 12 1987

Mystery bidder pays £1.8m for portrait

By Geraldine Norman, Sale Room Correspondent

A magnificent portrait of Sir Joseph Banks, the great naturalist and founding father of Australia, was sold for £1,815,000 at Sotheby's yesterday. It was painted by Benjamin West, the American portraitist who made his career in Britain and succeeded Reynolds as President of the Royal Academy.

The price set a new auction record for West and more than doubled Sotheby's pre-sale estimate of £600,000-£800,000. From a little under a million the bidding became a battle

between two determined contenders, a sunburnt young man at the back of the room and a member of Sotheby's staff relaying bids from a telephone. The young man emerged the victor but declined to give his name and said that he was acting as an agent.

He is believed in the art trade to have been acting for Alan Bond, the Australian entrepreneur and backer of the Americas cup. He is a keen art collector and four years ago made a surprise bid of

£261,360 for a portrait of Captain Cook. The telephone bidder is thought to have been another Australian collector.

Banks is shown in a heroic pose standing beside a half draped classical column. He wears a striped cloak woven from New Zealand flax and a book at his feet shows a drawing of flax made on Captain Cook's first voyage and now in the British museum.

In the same sale a new auction record was set at £198,000 for the Swiss born sporting artist Jacques Laurent Agasse. The 1908 painting, which was estimated to fetch only £30,000-£50,000, shows a groom in top hat and black and yellow livery leading a spirited chestnut hunter

down a country lane, with a coursing party in the distance.

As well as the record breaking West portrait, there were strong prices for attractive lesser portraits. Henry Hysing's "Portrait of Anne, Lady Stanhope", an early eighteenth century beauty with flowers in her hair and an exquisitely embroidered blue dress, made £13,750 (estimate £4,000-£6,000).

A primitive provincial portrait of a little girl with a big hat and two pigeons in a landscape secured £7,700 (estimate £2,500-£4,000) although the names of neither sitter nor artist were known. She dates from the mid-eighteenth century.

The sale totalled £3,458,840 with 10 per cent unsold.

The Society

The Society is an association of over 300 people with professional or amateur interest in Botany. The aim of the Society is to promote the study of plant systematics.

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The Newsletter

The Newsletter appears quarterly and keeps members informed of Society events and news, and provides a vehicle for debate and discussion. In addition original articles, notes and letters (not exceeding ten pages in length) will be published. Contributions should be sent to the Editor at the address given below, preferably typed in duplicate and double-spaced. All items incorporated in the Newsletter will be duly acknowledged. Authors are alone responsible for the views expressed.

Notes

- The deadline for contributions is the last day of February, May, August and November.
- ASBS Annual Membership is \$16 (Aust.) if paid by 31st March, \$20 thereafter. Students (full-time) \$12. Please remit to the Treasurer.
- Advertising space is available for products or services of interest to ASBS members. Current rate is \$30 per full page. Contact the Newsletter Editor for further information.
- All address changes should be sent to the Treasurer or the Editor.

Editor et al.

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