

FLORA MALESIANA ARACEAE

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Key words Araceae, Malesia, review.

Malesian aroids have, until recent years, received rather little attention by specialists since the great monographs of Engler & Krause (1905 – 1920). Indeed they remain one of the poorest known larger families of angiosperms in spite of their very significant ecological impact in the wet tropics. Currently some 34 genera and about 660 species are recognized for the region.

Since Engler & Krause, only Ridley, based at Singapore, both took something of a special interest in aroids, knew them well in the field and attempted to produce keys to their identification (1925; Malay Peninsula). Another specialist in the earlier part of this century was van Alderwerelt van Rosenburgh (1920, 1922), based at Bogner, who described many new Dutch East Indian aroid species, but provided no keys or much in the way of argument that his new species were distinguishable from previously described ones. Most of his new aroids were described from herbarium specimens or from cultivated plants, and his field knowledge of the family appears to have been little or none. Again no field botanist, Fuitado (at Singapore) took a special interest in Araceae, producing most notably a lengthy but almost useless incomplete and keyless review of the very difficult genus *Homalomena* in Malesia (1939).

Aroids of course also came under the scrutiny of generalists such as Backer & Bakhuizen van den Brink (Java), Elmer (Philippines), Koorders (Java), Merrill (esp. Philippines, Borneo), van Steenis (Java) and many other lesser figures [see Hay *et al.* (1995) for references], but specialist interest did not resume until the 1960's, with the appearance of revisions of *Xenophya* (= *Alocasia*), *Spathiphyllum*, *Amydrium* and *Aglaonema* carried out by Dan Nicolson (Nicolson, 1968a, 1968b, 1968c, 1969). Nicolson collected extensively in Malesia in the early sixties, and these generic revisions (in the modern sense, including keys to identification) are the first to have ever been produced by a Malesian Araceae specialist with extensive first hand field knowledge. As such they mark the opening of the current efforts at providing an account of the Araceae of Flora Malesiana and related subregional flora projects. Nicolson also produced the first key to genera of Malesian Araceae (distributed as duplicated typescript), and has gone on to deal extensively and valuably with nomenclatural matters in Araceae including lectotypification of the genera (1975), translating Engler's classification (1982), enumerating suprageneric names (1984), interpreting van Rheedee's *Hortus Malabaricus* (Nicolson *et al.*, 1988) and has usefully annotated a huge number of herbarium sheets – all vital ground – laying work.

At about the same time as Nicolson started, so too did Hotta – also with much field experience, making a particular contribution to the extraordinary group of genera of the *Schismatoglottidinae* (1965, 1966); Furtado (1981), providing checklists of the aroids of Sumatra (1984) and of *Homalomena* and *Anadendrum* in Malesia (1986a, b) and describing many new species. [See Hay *et al.* (1995) for a fuller listing].

Mention must also be made here of *Cryptocoryne* as one of the first Malesian aroid genera to receive specialist attention in the recent era. This Twile? large aquatic genus has been studied rather intensively in the living state in the aquaria of Europe since De Wit began in the 1950's. Extensive accounts of the genus have appeared in various German and Dutch editions of de Wit's work on aquarium plants (e.g. most recently, 1990). A key to the species was also produced (de Wit, 1970). De Wit's work, and an often criticized revi-

sion by Rataj (1975), formed a grounding for more recent work on the genus by Jacobsen, Mansor and Bogner with a more field – orientated emphasis apposite to an account of the genus in nature.

Bogner has made a very significant contribution to the taxonomy of the Araceae world – wide, with particular emphasis, in Malesia, on Malaysia, describing many new and interesting species, erecting the genus *Hottarum*, revising *Bucephalandra* and reviewing morphological variation in aroids. His work on generic limits in Araceae has been particularly important (Bogner, 1978; Bogner & Nicolson, 1991) culminating in the forthcoming Genera of Araceae (Bogner, Mayo & Boyce, 1996) which forms the basis of the generic concepts used for Flora Malesiana Araceae and which includes a synthesis of much of the taxonomic literature in Araceae, at least as relates to supraspecific concepts. Other syntheses of the literature on Araceae, which also bear in part on the Malesian region include those by Grayum (1990) and Hay & Mabberley (1991), each with rather differing perspectives.

The late 1980's and 1990's have seen a rapid accumulation of taxonomic interest in Araceae of the Malesian area, enough to allow a collaborative approach to be taken to the preparation of the Flora Malesiana account (Hay, 1994), which, it is to be hoped, will expedite a revision of the family in the region by the end of the century. Most recently, this has resulted in the publication of a checklist and bibliography of the Araceae of Malesia (together with Australia and the tropical western Pacific), prepared by the author team (Hay *et al.*, 1995), which brings together the over 1,400 names applied to aroids of the area and the over 1,200 literature references pertaining to them. Field work, recently adding *Nepthytis* as a new generic record for the region (Hay *et al.*, 1994) and the use of living research collections also figure strongly in the current efforts.

To date, 20 of the 34 genera have been revised completely or very nearly completely: *Aglaonema* (Nicolson, 1969), *Amorphophallus* * (Hettterscheid, Leiden), *Amydrium* (Nicolson, 1968c), *Anadendrum* * (Sunu, Bogor), *Arisaema* * (Murata, Tokyo), *Bucephalandra* (Bogner, 1980), *Colocasia* * (Hay, Sydney), *Cryptocoryne* (Jacobsen 1985; Jacobsen & Mansor 1995; Jacobsen in prep.), *Cyrtosperma* (Hay, 1988), *Hapaline* (Boyce, 1995), *Heteroaridarum* (Hotta, 1976), *Holochlamys* * (Hay), *Lasia* (Hay, 1988), *Nepthytis* (Hay *et al.*, 1994), *Pedicellarum* (Hotta, 1976), *Phymatarum* (Hotta, 1965), *Podolasia* (Hay, 1988), *Remusatia* (Li *et al.*, 1992), *Spathiphyllum* (Nicolson, 1968b) and *Typhonium* (Sriboonma *et al.*, 1994).

Four genera have either had subregional accounts completed or very nearly completed: *Alocasia* (New Guinea; Hay *et al.*, 1991), *Homalomena* * (New Guinea; Hay), *Pothos* (New Guinea; Hay, 1995), *Schismatoglottis* * (Malay Peninsula; Hay).

Of the remaining genera, *Aglaodorum*, *Aridarum*, *Furtadoa*, *Hottarum*, *Pistia* and *Pothoidium* are of relatively insignificant size. The challenges are *Piptospathes*, *Epipremnum*, *Rhaphidophora* (probably the most difficult genus in the region), *Scindapsus* and the completion of *Alocasia*, *Homalomena*, *Pothos* and *Schismatoglottis*.

Although 60% of the genera have been revised and 70% have at least had a subregional revision, this amounts only to c. 220 species or approximately 33% of the currently accepted species (defined in Hay *et al.* (1995) as those accepted by the last reviewer plus those described since) having been revised in the last 30 years.

It is both premature and beyond the scope of this paper to discuss in detail the classes of species that exist amongst the Malesian aroids. Nevertheless it does appear that highly variable, often widely distributed entities of broad ecological amplitude exist (ochlopecies) which often (though by no means always; e.g. *Alocasia nicolsonii* A. Hay) account for the reduction of large numbers of names into synonymy. Such are *Aglaonema simpler* Blume (West Malesia), *Cyrtosperma macrotum* Engl. (New Guinea), *Alocasia aequiloba* N. E.

* not yet published

Brown (New Guinea), *Alocasia longiloba* Miq. (Malay Peninsula to Java), *Epipremnum pinnatum* (L.) Engl. (widespread), the *Alocasia scabriuscula* N. E. Brown complex (Borneo) etc. As more of these emerge and are accepted with today's more dynamic species concepts, the number of accepted species may be reduced. However, by contrast, in some genera a number of appropriately recognized very local endemics of little variation content are also being discovered or maintained, e. g. *Cyrtosperma kokodense* A. Hay (New Guinea), *Nepthytis bintuluensis* A. Hay, Bogner et P. C. Boyce (Borneo), *Hapaline celator* P. C. Boyce (Borneo) and many others. Hence it is not possible to predict what the final number of accepted species is likely to be. Such contrasts however, should remind us that making a measure of biodiversity (in this or any other group) by straight species counts has pitfalls when 'simple' and 'complex' species are equated.

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