WHAT'S IN A FAMILY NAME?

COLIN BURROWS

It might be thought that the positions of plants in the higher categories of the worldwide classification hierarchy should be settled by now, two hundred-odd years since Linnaeus began the modern classification system. It is probably true that most genera are stably located in their families. Unfortunately, numbers of the New Zealand indigenous monocotyledon genera are not so firmly placed (cf. Connor & Edgar 1987). There are two reasons for the lack of certitude on these matters: (a) the phylogenetic (ancestral evolutionary) relationships of many monocotyledons are at present being examined by means of a range of chemical and other techniques; (b) there is not general agreement among the protagonists about the consequences of their findings.

The state of flux in this area can be illustrated by reference to some of our best-known plants, the ti, or cabbage trees in the genus *Cordyline*. Here, since 1925, are the family affiliations of *Cordyline* (Commerson) Jussieu 1789, according to various authors:

Family	**Author(s)**		**Reference**
Liliaceae (along with many other N.Z. genera)	Cheeseman, T.F.	1925:	*Manual of the New Zealand Flora.* Government Printer, Wellington. (ex Engler, H.G.A., Prantl, K.A.E. 1887-1925. Die natürlichen Pflanzenfamilien 1 Auflage. Engelmann, Berlin
Agavaceae (along with *Phormium*)	Moore, L.B., Edgar, E.	1970:	*Flora of New Zealand Vol. 2.* Government Printer, Wellington. (ex Hutchinson, J. 1959: *Families of Flowering Plants*, Oxford University Press, Oxford.)
Asteliaceae (along with *Astelia, Collospermum*)	Dahlgren, R.M., Clifford, H.T., Yeo, P.F.	1985:	*The Families of the Monocotyledons.* Springer Verlag, Berlin.
Dracaenaceae (along with *Astelia*)	Takhtajan, A.	1986:	*Floristic Regions of the World.* University of California Press, Berkeley.
Asphodelaceae (along with *Astelia, Collospermum, Arthropodium, Bulbinella*, etc)	Webb, C.J., Johnson, P., Sykes, W.	1990:	*Flowering Plants of New Zealand.* Botany Division, D.S.I.R., Christchurch. Based on views outlined in Clifford, H.T. 1977: Quantitative studies of inter-relationships amongst the Liliatae. *Plant Systematics and Evolution, Supplement 1,* 77-96.
Lomandraceae (along with *Arthropodium*)	Chase, M.W., Ruddall, P.J., Conran, J.G.	1996:	New circumscriptions and a new family of asparagoid lilies: genera formerly included in the Anthericaceae. *Kew Bulletin, 51*, 667-80.

Why have all these shifts occurred? Essentially through attempts to discover how the various genera in the lily-like groups of the monocotyledons are akin to one another, by comparisons with the aid of new tools. Up to about 1950 decisions about family affinities of plants were made by reference to flower and fruit structure, a few other anatomical characteristics, and sometimes chromosome numbers. Since then many additional techniques for examining the similarities and differences of plants have been developed. This was welcomed for the lily and other monocotyledon groups because their flower and fruit characters are often uniform. Various features of chemistry, embryology, pollen structure, cytology and, most recently, molecular structure, have been studied.

Those of us who just want to know the family location of *Cordyline*, (or others of the lily group) can be excused for feeling confused about the state of affairs outlined above. Different authors are using different criteria for comparisons and for making decisions about rank in the hierarchy (e.g., one author's family, may be another's subfamily, or tribe). Also, the latest version may not be the final word.

What can we poor mortals, who lack inside knowledge, do in these circumstances? One response is to feel enraged that there doesn't seem to be a definitive end to the chopping and changing (though this applies more at the level of species, or genus, than that of family). Because of the instability, plant systematists tend to loose credibility with other botanists who are the end users. We **do** need stability of nomenclature! Nevertheless there is a good rationale for seeking the best fit of genera into families. It is also important to know when similar-looking plants are **not** very closely related.

Genuine phylogenetic relationship patterns for plants in the classification hierarchy improve our appreciation of the evolutionary history of the plant groups concerned. However, **classifications** may not necessarily accord well with **phylogenetic pattern**, which really is concerned with sequences reflecting continuous and divergent change in the past, reflected now by a few living species that are the end points of the evolution. In spite of this the limits of species and genera, by and large, can be defined objectively (with some exceptions). Families are more subjective and arbitrary concepts (although some families are very natural). The trend in recent times has been to create small, new families to accommodate plants that don't fit well into the existing framework. Some such plants could, however, be placed in subfamilies rather than given full family status.

It **is** rather important to biogeographers to know how any genus is related to others. For example, when *Cordyline* was put in Agavaceae we thought of it as a relative of the agaves, yuccas and joshua trees of the Americas. When it was in the Dracaenaceae we looked, rather, to Africa and Asia-Malesia-Australia, among the dragon trees and mother-in-law's tongues, for its relatives. In the Lomandraceae it is in the context of some plant groups of Australia-Malesia-South-east Asia (with far-flung kin in Madagascar and Chile).

Cordyline itself occurs naturally in Mauritius, the Himalaya of India, South-east Asia, Malesia, New Guinea, New Caledonia, Queensland, Norfolk I., New Zealand and South America. *C. terminalis* is widespread in the Pacific, but was taken to many of the distant islands, including New Zealand and Hawaii, by Polynesian voyagers, as it was a useful food and fibre plant.

Footnote: Some recent sightings of cultivated *Cordyline australis*: Greece (Athens); Spain (Alcazar gardens in Seville); France (Brittany); England (Devon); Scotland (W); Ireland (SE); Wales (W).

References

Balgooy, M.M.J.van 1971. Plant geography of the Pacific. *Blumea Supplement, Vol. 6.*

Connor, H.E., Edgar, E. 1987. Name changes in the indigenous New Zealand Flora, 1960-1986 and Nomina Nova IV, 1983-1986. *New Zealand Journal of Botany 25*, 115-170.