FEATURE

A PARADOX: SOME EUCALYPTS ARE NO LONGER *EUCALYPTUS*

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Late last year a new genus, *Corymbia*, was established for a part of the genus *Eucalyptus* (Hill & Johnson 1995). The species concerned are those known colloquially as bloodwoods, ghost gums and spotted gums. The name *Corymbia* comes from the word corymb, a technical botanical word for a particular arrangement of flowers. Changes of this sort occur frequently as a result of taxonomic research, but they do not often affect a national icon. It would be natural for such questions to arise as why? is it necessary? isn't it premature? do taxonomists have the right to impose such inconvenience? who cares (or, does it affect me)? And what of the paradox in the title? I hope that I can satisfactorily answer these questions.

But first, a little history. *Eucalyptus* has been regarded as a single, readily recognisable genus since early last century. A different view was introduced by Carr & Carr (1962), who considered that two genera should be recognised, *Eucalyptus* and *Symphyomyrtus*. Then, twenty five years ago, Pryor & Johnson (1971) published a new classification of the species of *Eucalyptus* into seven subgenera. Subsequently Johnson indicated an intention to make the subgenera into independent genera. One of these subgenera was called *Corymbia*, and it is this, plus the ghost and spotted gums (comprising another of the 1971 subgenera, *Blakella*) which has now been given the rank of genus. Thus, the question as to whether the change is premature can be disposed of: the notion of subdividing *Eucalyptus* has been around for many years, additional information has accrued in the meantime, and a generation of botanists, and more particularly of foresters, have grown up aware of the 1971 classification, and therefore the change can be no great shock for many people. To finish the history with a look to the future, Hill & Johnson indicate that the separation of *Corymbia* deals with the major problem in the content of *Eucalyptus*, and that further subdivisions of the genus are not planned. The largest of the 1971 subgenera, *Symphyomyrtus*, has proven to be less worthy of separation than *Corymbia*.

So why was the change made? Scientific classifications group organisms according to their relationships, as perceived by taxonomists according to whichever method they employ. When new data or new methods show the existing classification to be inadequate, changes are proposed. But was it necessary? Yes, if a classification is found to be inadequate or wrong, then changes should be proposed, because classifications are our means of understanding, summarising and working with biodiversity. A poor or outdated classification would result in bad science in other subject areas and could be economically wasteful. Changing classifications, and perhaps more importantly the changing of names that accompanies it, are undoubtedly inconvenient, so do taxonomists have the right to impose such inconvenience? Unfortunately our system of biological classification is expressed through names, which therefore change when the classification is changed. Practical convenience is not a scientific criterion, but taxonomists do consider the factor when proposing changes. In the case of *Eucalyptus* and *Corymbia*, it is certain that this aspect was considered by the authors, because several years ago there was a campaign in newspapers against the mooted change. Ultimately it has been their belief in the importance of a sound classification based on evolutionary principles that has led them to over-ride that aspect.

The differences between *Corymbia* and *Eucalyptus* involve various parts of the plant and are often obscure, because they are small in size. They include leaf veining, wood structure, presence of crystals in young leaves, types of hairs on leaves, arrangement of the leaves on the twigs, and the structure of the bud cap. However the familiar shape of the nuts of Marri trees ("honky nuts"), are the best way of recognising species of *Corymbia* in south western Australia.

The final question posed above is: who cares (or, does it affect me)? The Herbarium staff care, because they are responsible for keeping the physical arrangement and labelling of the plant specimen collections and associated database WAHERB in step with the currently accepted classification, and also for the updating of databases such as WACENSUS. Scientists ought to care, because they should use the current, most accurate name and concepts of taxa. Fortunately we in CALM have Paul Gioia's computer program SEDIT which uses WACENSUS to update scientific names in research databases. Another reason that scientists should care is that alternative classifications may reveal new relationships in their data, or suggest new hypotheses. It should be pointed out that new classifications are not adopted instantly and uncritically by the Herbarium, although eventually most are followed. *Corymbia* has been accepted by the W.A. Herbarium, according to its head, Neville Marchant.

Already there are indications that the recognition of *Corymbia* and the particular concept (i.e. the species that are included) is being supported by new evidence. Hill & Johnson employed cladistic analysis, which emphasises phylogenetic relationships as a principle for classifying, and used morphological and anatomical information. It is therefore of interest that the authors mention in a footnote that an independent study ("of

which we had no prior knowledge") employing DNA analysis as well as morphological data (Ladiges et al. 1995), supports the concept of *Corymbia*. Very recently another independent paper employing a different DNA analysis appeared (Sale et al. 1996) citing Hill & Johnson ("of which we had no prior knowledge") in a footnote, and again there is support for their concept of *Corymbia* and their general classification structure of the eucalypts.

It might be of interest to list the more important contents of Hill & Johnson's paper, as follows.

1. A case for subdividing the eucalypts based on phylogenetic (i.e. cladistic) analysis.
2. Description of the new genus *Corymbia* K.D. Hill & L.A.S. Johnson.
3. A classification of the species of *Corymbia*.
4. Identification keys for the species of *Corymbia*.
5. New nomenclatural combinations for many species.
6. Thirty three new species and nineteen new subspecies described.
7. A table of comparison of the species names used in Brooker & Kleinig's (1994) "Field Guide to Eucalypts," Volume 3, with the Hill & Johnson names. It is complicated: there are numerous differences of concept, there are the lettered (un-named) species in the Field Guide that now have names, and there are the entirely new species of Hill & Johnson, to take into account.

Some well known or otherwise interesting species of eucalypt are affected by this study. Southwestern species now placed in *Corymbia* include Marri (*C. calophylla*), Red Flowering Gum (*C. ficifolia*), Mountain Marri (*C. haematoxylon*), and the new species *C. chlorolampra*, representing the Mt Leseuer populations formerly included in *Eucalyptus haematoxylon*. Familiar cultivated species include Lemon Scented Gum (*C. citriodora*), Spotted Gum (*C. maculata*) and Yellow Bloodwood (*C. eximia*). Most species of *Corymbia* occur in northern Australia and in the arid regions of the northern half of the continent; there are a number of species in the Pilbara for example. One species of note is the newly described *C. aparrerinja*, "the much-publicised 'Ghost Gum' of central Australia" - refer to Namatjira paintings for illustrations. One little conundrum relevant to CALM that may have been solved is the identity of the venerable group of trees that shade CALM's campsite at Eagle Bore in the Gibson Desert Nature Reserve. Several unsuccessful attempts have been made to identify them, but it is apparent from this paper that the difficulties were because they belong to a previously un-named species. The correct name appears to be *C. candida* subspecies *dipsodes* (both species and subspecies being new). The name dipsodes means "thirsty", and although allegedly based on the dry environment, it may also have something to do with the rapid emptying of drinking vessels often to be observed in the vicinity.

Finally, the explanation of the paradox in the title. The vernacular name eucalypt has traditionally been equivalent to the genus *Eucalyptus*. However with the re-naming of many *Eucalyptus* species as *Corymbia*, it would be preferable to retain eucalypt as a handy collective term without having to decide to which genus a given species or forest make-up belonged. Since *Eucalyptus* (in the new strict sense), *Corymbia*, and *Angophora* (Apple or Apple Box trees) are together considered to comprise a single higher level grouping, we can, as Hill & Johnson recommend, call them all eucalypts. To us in W.A., this means business as usual since we have no native *Angophora*.

References

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