

Removal of the informal name *Epiblema grandiflorum* var. *cyaneum* ms from the Census of Western Australian Plants

Epiblema grandiflorum R.Br. var. *cyaneum* K.W.Dixon ms was discovered by members of the West Australian Native Orchid Study and Conservation Group in 1984 (Brown *et al.* 2008) and was added to the *Census of Western Australian Plants* (Western Australian Herbarium 1998–) as an unpublished name in 1996 to encompass a small population of sky-blue-flowered plants of the widespread, normally lilac-blue to deep mauve-flowered *E. grandiflorum*. The sky-blue-flowered plants were known only from a small, seasonal wetland dominated by sedges beneath *Melaleuca preissiana* Schauer and *M. raphiophylla* Schauer in Beechboro, a northern suburb of Perth on the Swan Coastal Plain, where they grew in low numbers intermixed with normally-coloured plants of *E. grandiflorum*.

Epiblema grandiflorum var. *cyaneum* ms was declared as Rare Flora in 1991 (as *E. grandiflorum* var. *caeruleum* ms) and as Critically Endangered in 1997, under the *Wildlife Conservation Act 1950* (Atkins 2007), on account of its narrow geographic range and continuing population decline. The c. 4 ha wetland where it occurs was gazetted as a Nature Reserve under the management of the Department of Conservation and Land Management (now the Department of Environment and Conservation) in early 1998, when the surrounding area was developed for housing. Interim Recovery Plans were subsequently prepared and a range of management actions proposed, some of which have been implemented (Stack *et al.* 2000; Luu & English 2004).

Despite these measures, *E. grandiflorum* at the site has declined, probably as a result of changes in hydrology and fire regime following urban development of the surrounding area (Stack *et al.* 2000). Surveys for *Epiblema* during its summer flowering season between 2008 and 2010 by the present author failed to locate any plants in the reserve. Dormant or non-flowering plants may still be present at the site.

In a manuscript intended to formally describe *E. grandiflorum* var. *cyaneum* (Dixon, unpublished), the only difference given between the variety and typical *E. grandiflorum* was flower colour. The diagnosis intended for the taxon was as follows:

Differs from Epiblema grandiflorum in the sky blue colour of the flowers and distinct dark blue ocelli on petals and sepals.

No other morphological differences were noted, and the description given matches well with that of the typical form. The dark ocelli noted are also found on typically-coloured *E. grandiflorum* but are more prominent on var. *cyaneum* ms due to the paler ground-colour of the perianth. Stack *et al.* (2000: 14) noted:

The obvious feature which distinguishes Epiblema grandiflorum var. cyaneum from [...] Epiblema grandiflorum var. grandiflorum, is its delicate pale blue colour. Otherwise both orchids are similar in shape and share the same habitat requirements.

Subsequent to the recognition of the var. *cyaneum* ms plants at Beechboro, a population of *E. grandiflorum* near Walpole was found with a wide range of colour variants including purple, mauve, pink and violet (Brown *et al.* 2008). Originally considered to represent var. *cyaneum* ms, none of the plants in the Walpole population have the same blue shade as the Beechboro plants, and they are now considered to be variants of typical *E. grandiflorum* (Brown *et al.* 2008).

Colour variants are common in many plant species throughout the world, occurring either as single individuals, as small populations intermingled with typically-coloured individuals, or as geographically correlated variants. The genetic basis for differing colour variants is rarely understood, but includes single gene mutations interrupting or modifying pigment metabolic pathways (e.g. Cooley & Willis 2009). Colour variants are frequently not genetically isolated from each other, and may arise spontaneously as 'sports'.

In the case of *E. grandiflorum* var. *cyaneum* ms, an unpublished genetic analysis based on very limited sampling compared 93 AFLP markers between a single individual of var. *cyaneum* ms and four typically-coloured individuals growing in close proximity to it at the Beechboro site (S. Krauss, pers. comm.). The var *cyaneum* ms plant was no more different from the four typical plants than they were from each other, suggesting little or no genetic differentiation of the blue-flowered plants.

Many colour variants occur within the Western Australian flora. For example, *Kunzea pulchella* (Lindl.) A.S.George has predominantly red-flowered, predominantly white-flowered and mixed populations, and many *Thelymitra* J.R.Forst. & G.Forst. species such as *T. macrophylla* Lindl. are variable in their colouration, with blue, white, pink and purple-flowered plants often found growing together. *Epiblema grandiflorum* is a species known to vary in colour throughout its range, sometimes markedly (as in the Walpole population). While conservation of unusual variants of any plant species is desirable, taxonomic recognition of such variants is not warranted unless evidence is available that they represent genetically distinct evolutionary lineages. Geographically restricted variants such as *E. grandiflorum* var. *cyaneum* ms are no more likely to warrant taxonomic recognition than widespread and common variants. Removal of *Epiblema grandiflorum* var. *cyaneum* ms from the *Census of Western Australian Plants* is recommended.

References

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