

Notes on the identity and status of Western Australian phrase names in *Corymbia* and *Eucalyptus* (Myrtaceae)

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Abstract

Nicolle, D., French, M.E. & Thiele, K. Notes on the identity and status of Western Australian phrase names in *Corymbia* and *Eucalyptus* (Myrtaceae). *Nuytsia* 22(3): 93–110 (2012). A total of 27 phrase names in *Corymbia* K.D.Hill & L.A.S.Johnson (1) and *Eucalyptus* L'Hér. (25) which occur at least partly in Western Australia have been assessed with respect to their identity and status. Of these 27 phrase names, we recommend that 14 be removed from Western Australia's plant census because they either represent duplicate names (taxonomically matching another phrase name or published taxon), are taxonomically indistinct or very poorly understood, or are considered to represent hybrids. We erect eight new phrase names for *Eucalyptus* in Western Australia.

Introduction

The Western Australian Herbarium has a policy of including undescribed taxonomic entities in its specimen and census databases to accommodate potential new taxa that have not yet been formally described. This is regarded as a necessary complement to taxonomic work in an area as rich in undescribed taxa as Western Australia. Many of the taxa so treated are restricted in distribution and rare, and giving them interim recognition pending taxonomic revision has important policy implications. Undescribed taxa as recognised at the Western Australian Herbarium are given equal status with described species in the *Declared Rare and Priority Flora List for Western Australia* (Smith 2012) and hence have regulatory and legislative protection. Similarly, such undescribed taxa, named using an Australia-wide agreed phrase-naming convention (Barker 2005), are included in the *Australian Plant Census* project (Council of Heads of Australasian Herbaria 2005–) and may be given legislative protection under the *Commonwealth Environment Protection and Biodiversity Conservation Act* (1999).

Given the regulatory, legislative and policy implications of recognising such potential taxa, it is important that they be recognised and phrase-named only when there is reasonable justification that they are likely to represent discrete taxa once studied. To this end, the Western Australian Herbarium in recent years has instituted a policy of (1) requiring reasonable justification when new phrase names are added to Western Australia's plant census, principally in the form of a statement of diagnosis of

the entity from related and/or similar species, akin to that which accompanies a taxonomic paper, and (2) lodging a reference specimen for the phrase name in a public herbarium (preferably at PERTH for Western Australian endemic taxa).

Before this policy was instituted, however, a number of phrase names were added to the census with few details and no recorded justification for their distinctiveness. Such phrase names, devoid of information and equivalent to taxonomic *nomina nuda*, tend to remain on the census for many years pending a complete revision of the group to which they belong, potentially compromising its integrity.

This paper is a review of all *Eucalyptus* L'Hér. and *Corymbia* K.D.Hill & L.A.S. Johnson phrase names currently on Western Australia's plant census (Western Australian Herbarium 1998–) This review formally removes a number of *Eucalyptus* phrase names, equivalent to reducing them to taxonomic synonyms. It must be emphasised that the purpose of this paper is to review individual phrase names, and not to provide a treatment or to discuss other synonyms for the taxa mentioned, which would require a detailed taxonomic treatment of each taxon. The opportunity is taken here to also erect a number of new phrase names for *Eucalyptus* in Western Australia.

In many cases, a phrase name has been based on an earlier-coined manuscript (unpublished) name or names. In such cases, we have listed the earlier-coined manuscript name as a synonym of the phrase name (regardless of whether we accept the phrase name or recommend its removal from the census) where we can be sure of the correct application of the manuscript name. We can be sure of the correct application of the manuscript name where one of us has coined the name, as well as in cases where we have been able to determine the author of a manuscript name and have been able to discuss the name's intended application with the author. In some cases we cannot be completely certain of the correct application of an earlier-coined manuscript name, due to the author (or authors) of the manuscript name being deceased. In such cases we list the manuscript name as a 'probable synonym'.

We have grouped the phrase names dealt with here into three categories:

- 14 phrase names which we recommend be removed from Western Australia's plant census (Western Australian Herbarium 1998–) because they either represent duplicate names (taxonomically matching another phrase name or published taxon; nine names), are taxonomically indistinct or very poorly understood (five names); or are representative of putative hybrids (one name);
- 13 phrase names which we accept as certain or probable undescribed taxa of known affinity; and
- Eight new phrase names erected here.

Of the 21 phrase names that we here recognise (including the eight new phrase names), seven occur in *E. ser. Porantherae* Benth. Seedling characteristics are important in delimiting taxa in this series, and hence the distribution of some of these seven phrase names is poorly understood at the present time. The series is the subject of an extensive and long-term taxonomic study by two of us (DN & MEF) and Ian Brooker.

Phrase names which we recommend be removed from Western Australia's plant census***Eucalyptus drummondii* subsp. *Moora* (D. Nicolle 1653)**

Voucher specimen. WESTERN AUSTRALIA: SE of Moora, 25 Jan. 1996, *D. Nicolle 1653 & M.E. French* (AD, CANB).

Synonym. *Eucalyptus drummondii* subsp. *pendiflora* D.Nicolle ms (Western Australian Herbarium 1998–).

Notes. This phrase name represents one of several morphological variants of *E. drummondii* Benth. The variant is distinguished within *E. drummondii* by the non-waxy adult parts and the more or less pendulous inflorescences due to the generally long peduncles and pedicels and the relatively large (and therefore heavy) flower buds and fruits. However, the distribution of this variant is poorly understood (specimens attributable to this variant have only been collected in the Moora area) and its morphology appears to be variable and to overlap with other variants of *E. drummondii*. We are currently of the opinion that this variant is not worthy of taxonomic recognition, pending further investigation.

We therefore recommend that the phrase name *E. drummondii* subsp. *Moora* (D. Nicolle 1653) be removed from Western Australia's plant census (Western Australian Herbarium 1998–) and that specimens filed under that name be included in *E. drummondii*.

***Eucalyptus drummondii* subsp. *York* (D. Nicolle & M. French DN 3684)**

Voucher specimen. WESTERN AUSTRALIA: E of York, 12 Nov. 2000, *D. Nicolle 3684 & M.E. French* (CANB, PERTH).

Synonym. *Eucalyptus drummondii* subsp. *glauciflora* D.Nicolle ms (Western Australian Herbarium 1998–).

Notes. This phrase name represents one of several morphological variants of *E. drummondii* Benth. The variant has been distinguished within *E. drummondii* by the waxy branchlets, flower buds and young fruits. The inflorescences are generally held erect. The distribution of this variant is poorly understood (specimens attributable to this variant have mainly been collected in the region east of Perth) and its morphology is variable and appears to overlap with other variants of *E. drummondii*. We are currently of the opinion that this variant is not worthy of taxonomic recognition, pending further investigation.

We therefore recommend that the phrase name *E. drummondii* subsp. *York* (D. Nicolle & M. French DN 3684) be removed from Western Australia's plant census (Western Australian Herbarium 1998–) and that specimens filed under that name be included in *E. drummondii*.

***Eucalyptus falcata* subsp. *Jerramungup* (Canning CBG 038636)**

Voucher specimen. WESTERN AUSTRALIA: 1.4 miles from Jerramungup towards Albany, 1 Nov. 1968, *E.M. Canning* WA/68 6943 (CBG 038636).

Probable synonym. *Eucalyptus falcata* subsp. *extenta* L.A.S. Johnson & K.D. Hill ms (Western Australian Herbarium 1998–). In the absence of a type or reference specimen, and considering that both authors of the manuscript name are deceased, we cannot with certainty determine the concept of this name.

Notes. This phrase name is equivalent to *E. falcata* Turcz. var. *ecostata* Maiden, one of several taxa, previously included in the 'mallee' variant of *E. falcata*. This variety is a common taxon distributed in subcoastal areas from the Stirling Range eastwards to near Munglinup. Specific status for *E. falcata* var. *ecostata* seems appropriate, but no published combination for the variety has yet been made; it will be formally raised to specific status as *E. ecostata* by two of us (DN & MEF) in a paper revising *E. ser. Falcatae* Brooker & Hopper in preparation for *Nuytsia*.

We therefore recommend that the phrase name *E. falcata* subsp. *Jerramungup* (Canning CBG 038636), be removed from Western Australia's plant census (Western Australian Herbarium 1998–) and that specimens determined as this name be filed under *E. falcata* var. *ecostata* until such time as this taxon is described at specific status.

***Eucalyptus oldfieldii* subsp. *Millar Range* (M. French 303)**

Voucher specimen. WESTERN AUSTRALIA: between Amy and Winterbottom Rocks, NW Neale Junction, Great Victoria Desert, 9 Sep. 1997, *M. French* 303 (PERTH).

Synonym. *Eucalyptus oldfieldii* subsp. *millarensis* D. Nicolle ms (Western Australian Herbarium 1998–).

Notes. This phrase name is taxonomically very similar to *E. sp. Little Sandy Desert* (D. Nicolle & M. French DN 4304). Both phrase names represent a variant of *E. oldfieldii* F. Muell. which occurs in parts of the Little Sandy, Gibson and Great Victoria Deserts, to the north and east of the typical subspecies. *Eucalyptus oldfieldii* subsp. *Millar Range* has somewhat more obconical fruits than desert populations elsewhere; however we regard the Millar Range population as a minor variant and not worthy of taxonomic distinction from *E. sp. Little Sandy Desert*. We have chosen to accept (see below) the phrase name *E. sp. Little Sandy Desert* as many more specimens are currently attributed to this phrase name compared to *E. oldfieldii* subsp. *Millar Range*.

We therefore recommend that the phrase name *E. oldfieldii* subsp. *Millar Range* (M. French 303) be removed from Western Australia's plant census (Western Australian Herbarium 1998–) and that specimens filed under this name be included in *E. sp. Little Sandy Desert* (D. Nicolle & M. French DN 4304).

***Eucalyptus* sp. *Eyre* (K. Hill & L.A.S. Johnson KH 2170)**

Voucher specimen. WESTERN AUSTRALIA: 14.2 km S of Hwy on track to Eyre telegraph station (now Eyre Bird Observatory), 3 Nov. 1986, *K. Hill* 2170 & *L.A.S. Johnson* (CANB, MEL, NSW, PERTH).

Probable synonym. *Eucalyptus sinuensis* K.D. Hill & L.A.S. Johnson ms (Western Australian Herbarium 1998–). In the absence of a type or reference specimen, and considering that both authors of this manuscript name are deceased, we cannot with certainty determine the concept of this name.

Notes. For comments, see under the following phrase name.

***Eucalyptus* sp. Madura Beach (D. Nicolle 1570)**

Voucher specimen. WESTERN AUSTRALIA: S of Madura Pass in sandhills, 21 Sep. 1995, *D. Nicolle* 1570 (AD, CANB).

Synonym. *Eucalyptus discreta* subsp. *densiflora* D.Nicolle ms (Western Australian Herbarium 1998–).

Notes. The two phrase names *E. sp. Eyre* and *E. sp. Madura Beach* represent eastern populations of *E. discreta* Brooker, and were previously considered by one of us (DN) to represent a potential new taxon on the basis of its apparently more persistent bark, duller leaves and more pointed opercula. The representative specimen for *E. sp. Eyre* also bears the manuscript name *Eucalyptus 'sinuensis'*, so presumably the collectors of this specimen also thought it was worthy of taxonomic distinction, although we can no longer ascertain their reasoning. Subsequent field and herbarium studies by us have indicated that the eastern populations of *E. discreta* are not worthy of taxonomic distinction. The species has a more- or- less continuous distribution from near Esperance eastwards along the Wylie Scarp to south of Madura Pass. The extent of persistent bark appears to be associated with plant size and time elapsed since the plant was last burnt in a wildfire, the variation in adult leaf gloss appears to be seasonal, and operculum shape varies widely throughout the distribution of the species. *Eucalyptus discreta* is a member of *E. ser. Porantherae*, in which a number of potential new taxa have been identified; it is the subject of an extensive and long-term taxonomic study by two of us (DN & MEF) and Ian Brooker.

We therefore recommend that the phrase names *E. sp. Eyre* (K. Hill & L.A.S. Johnson KH2170) and *E. sp. Madura Beach* (D. Nicolle 1570) be removed from Western Australia's plant census (Western Australian Herbarium 1998–) and that specimens filed under these names be included in *E. discreta*.

***Eucalyptus* sp. H Kimberley Flora (S.J. Forbes 2560)**

Voucher specimen. WESTERN AUSTRALIA: 17.9 km SSW Bungle Bungle Outcamp, 6.9 km S Tickalara Track en route to Piccaninny Creek, 7 Jul. 1984, *S.J. Forbes* 2560 (CANB, MEL, PERTH).

Notes. The *Flora of the Kimberley Region* (Rye 1992) included *Eucalyptus* sp. H, described as closely related to *E. brevifolia* F.Muell. but differing in its silvery shoots. No representative specimens were cited for the taxon. The description suggests that the concept of the name matches what has been named as *E. ordiana* Dunlop & Done (Dunlop & Done 1992). However, it appears that the representative specimen (*S.J. Forbes* 2560) later chosen when the phrase name *E. sp. H Kimberley Flora* was erected, does not match the intended concept of the phrase name as indicated by Rye (1992).

The specimen *S.J. Forbes* 2560 appears to be a hybrid between *E. brevifolia* and the common box-barked eucalypt species of the area (here included in *E. leucophylla* Domin; see below). Both these species occur in the locality, which is on a main track on the western edge of the Bungle Bungle Range. The specimen is intermediate in morphology between these two species and the label data states that it occurs with *E. brevifolia*.

Three other specimens at PERTH have been determined as *E. sp.* H Kimberley Flora, and we have examined these in an attempt to further resolve the identity of the phrase name. Each of these three specimens requires specific comment:

- 19 km N of Springvale Homestead, 13 km W of Great Northern Highway, 68 km N of Halls Creek, Kimberley, 21 Jun. 1976, *A.C. Beauglehole* 53452. This specimen represents a mixed collection, with the mounted branchlet representing *E. brevifolia* and the bag of flower buds from *E. tetradonta* F.Muell.
- 6.5 km NE of Mary River Crossing, 92 km SW of Halls Creek, 19 Jun. 1976, *A.C. Beauglehole* 53256. This specimen appears closest to *E. brevifolia*, and is certainly not representative of *E. ordiana*.
- 7.8 miles by road from the King River Crossing towards Karunjie, 31 Oct. 1973, *M.I.H. Brooker* 4228. This specimen represents either *E. ordiana* or an intergrade (or hybrid) between *E. ordiana* and *E. brevifolia*.

In summary, these three specimens do not provide any further information as to the identity of the ‘concept’ of *E. sp.* H Kimberley Flora, but do confirm that the identity of the phrase name is confusing.

We therefore recommend that the phrase name *Eucalyptus sp.* H Kimberley Flora (S.J. Forbes 2560) be removed from Western Australia's plant census (Western Australian Herbarium 1998–) (with the ‘concept’ of this phrase name representing *E. ordiana*) and that the representative specimen be included in *E. brevifolia* × *E. leucophylla*.

The nomenclature of the northern box-barked eucalypts allied to *E. leucophylla* requires reassessment. Hill and Johnson (2000) recognized four taxa that we would include in *E. leucophylla*, including two that they originally described at the time (*E. limitaris* L.A.S.Johnson & K.D.Hill and *E. tephrodes* L.A.S.Johnson & K.D.Hill) and two existing species (*E. leucophylla* and *E. tropica* Cabbage). The four species were distinguished in their key (among other species) using a combination of State borders and the presence/absence of wax on the branchlets, leaves and/or flower buds (*E. tropica* if waxy and in Queensland; *E. tephrodes* if waxy and in Western Australia or the Northern Territory; *E. leucophylla* if not waxy and in Queensland; and *E. limitaris* if not waxy and in Western Australia or the Northern Territory). Setting aside political boundaries, considering that the waxiness of branchlets is variable within and between populations in the species complex, and in the absence of any other distinguishing characteristics, we have included all four of these species in our concept of *E. leucophylla*.

***Eucalyptus sp.* Mukinbudin (D. Nicolle & M. French DN 3486)**

Voucher specimen. WESTERN AUSTRALIA: NW side of Elachbutting Hill, 1 Oct. 2000, *D. Nicolle* 3486 & *M. French* (AD, CANB, PERTH).

Notes. This phrase name represents the published name *E. leptophylla* F.Muell. ex Miq. var. *floribunda* Blakely. This variety is restricted to sandy soils around granite outcrops in the north-eastern part of the wheatbelt, and is most closely related to *E. horistes* L.A.S.Johnson & K.D.Hill, differing in its waxy branchlets and shorter, broader, dull blue-green adult leaves. Specific status for *E. leptophylla* var. *floribunda* seems appropriate, but no published combination for the variety has yet been made. The variety has a more distant relationship to *E. leptophylla* var. *leptophylla*. *Eucalyptus leptophylla* var. *floribunda* is a member of *E. ser. Porantherae*, in which a number of potential new taxa have

been identified and which is the subject of an extensive and long-term taxonomic study by two of us (DN & MF) and Ian Brooker.

We therefore recommend that the phrase name *E. sp. Mukinbudin* (D. Nicolle & M. French DN 3486) be removed from Western Australia's plant census (Western Australian Herbarium 1998–) and that specimens determined as this name be filed under *E. leptophylla* var. *floribunda* until such time as this taxon is described at specific status.

***Eucalyptus* sp. Ravensthorpe (A.S. George 616)**

Voucher specimen. WESTERN AUSTRALIA: c. 6 miles S of Ravensthorpe, 2 Jan. 1960, *A.S. George* 616 (PERTH).

Probable synonym. *Eucalyptus austrina* L.A.S.Johnson & K.D.Hill ms (Western Australian Herbarium 1998–). In the absence of a type or reference specimen, and considering that both authors of this manuscript name are deceased, we cannot with certainty determine the concept of this name.

Notes. This phrase name is either taxonomically very similar to, or conspecific with, the phrase name *Eucalyptus* sp. Fraser Range (D. Nicolle 2157). Both phrase names represent one of a number of variants of *E. rigidula* Maiden, a member of *E. ser. Porantherae*, in which a number of potential new taxa have been identified and which is the subject of an extensive and long-term taxonomic study by two of us (DN & MEF) and Ian Brooker. We have chosen to accept the phrase name *Eucalyptus* sp. Fraser Range for this taxon as we are familiar with the population representative of this phrase name in the field.

We therefore recommend that the phrase name *E. sp. Ravensthorpe* (A.S. George 616) be removed from Western Australia's plant census (Western Australian Herbarium 1998–) and that specimens filed under this name be included in *E. sp. Fraser Range* (D. Nicolle 2157).

***Eucalyptus* sp. Tarin Rock (D. Nicolle & M. French DN 3739)**

Voucher specimen. WESTERN AUSTRALIA: 3.5 km from Hotker Rd on Katanning to Nyabing road towards Katanning, 26 Jan. 2001, *D. Nicolle* 3739 & *M. French* (AD, CANB, NSW, PERTH).

Synonym. *Eucalyptus extensa* subsp. *dasyphloia* D.Nicolle ms (Western Australian Herbarium 1998–).

Notes. This phrase name represents populations of *E. extensa* L.A.S.Johnson & K.D.Hill which we previously considered to represent a potential new taxon on the basis of the rough bark on their lower stem(s). Subsequent field research and the cultivation of plants from this entity (including from the representative specimen) since 2001 have indicated that the persistence of bark is variable between and within populations of the species and may be dependant on stem age and/or past damage sustained to the stem(s) of the plants.

We therefore recommend that the phrase name *E. sp. Tarin Rock* (D. Nicolle & M. French DN 3739) be removed from Western Australia's plant census (Western Australian Herbarium 1998–) and that specimens filed under this name be included in *E. extensa*.

Eucalyptus sp. Wagerup (L. Johnson 9127 & B. Briggs)

Voucher specimen. WESTERN AUSTRALIA: 5.8 km on Willowdale Rd SSE of Hwy at Yalup Brook, then 2.3 km NNE on Scarp Rd (= Boundary Rd), 24 Oct. 1988, *L. Johnson 9127 & B. Briggs* (BRI, CANB, NSW, PERTH).

Synonym. *Eucalyptus graniticola* Hopper ms (Western Australian Herbarium 1998–); *Eucalyptus graniticola* Hopper ined. (Brooker & Kleinig 2001; Rossetto *et al.* 1996). This manuscript name is erroneously listed as *Eucalyptus graniticola* Brooker & Hopper ms in the *Australian Plant Name Index* (Centre for Australian National Biodiversity Research 199–).

Notes. This phrase name is represented by a solitary wild individual on the Darling Scarp south of Perth. The individual has adult morphology intermediate between a small-fruited variant of *E. drummondii*, populations of which are known within 5 km of *E. sp. Wagerup*, and *E. rudis* Endl., which is common along watercourses in the region. The plant does not produce viable seed, hence its seedling morphology cannot be examined. Rossetto *et al.* (1996) investigated the potential hybrid origin of the solitary wild individual of *E. sp. Wagerup* using DNA fingerprinting, and concluded that it certainly represents the hybrid *E. drummondii* × *E. rudis*.

We therefore recommend that the phrase name *E. sp. Wagerup* (L. Johnson 9127 & B. Briggs) be removed from Western Australia's plant census (Western Australian Herbarium 1998–) and that specimens filed under this name be filed under *E. drummondii* × *E. rudis*.

Eucalyptus sp. Yealering (D. Nicolle & M. French DN 3424)

Voucher specimen. WESTERN AUSTRALIA: E of Yealering towards Kulin, 16 Sep. 2000, *D. Nicolle 3424 & M.E. French* (AD, CANB, PERTH).

Synonym. *Eucalyptus kondininensis* subsp. *tuberosa* D.Nicolle ms (Western Australian Herbarium 1998–).

Notes. This phrase name represents populations of *E. kondininensis* Maiden & Blakely which we had previously considered to represent a potential new taxon on the basis of the presence of a lignotuber and multi-stemmed habit. Subsequent field research and the cultivation of plants from various populations of *E. kondininensis* at Currency Creek Arboretum since 1993 have indicated that the species typically develops a lignotuber and is variable with regard to habit (varying from a robust several-stemmed mallee to a moderate-sized single-stemmed tree), which appears to be dependant on past physical damage sustained to the plant.

We therefore recommend that the phrase name *E. sp. Yealering* (D. Nicolle & M. French DN 3424) be removed from Western Australia's plant census (Western Australian Herbarium 1998–) and that specimens filed under this name be included in *E. kondininensis*.

Eucalyptus sp. Zanthus (R. Davis 10360)

Voucher specimen. WESTERN AUSTRALIA: 124.7 km N of Balladonia along Zanthus – Balladonia track, 20 Jul. 2002, *R. Davis 10360* (PERTH).

Notes. This phrase name taxonomically matches *E. sp.* North Balladonia (D. Nicolle & M. French DN 3620). Both phrase names represent populations of mallees of *E. ser. Rufispermae* Maiden occurring between Balladonia and Zanthus, which have at least superficial similarities to *E. assimilans* L.A.S. Johnson & K.D.Hill, *E. gypsophila* D.Nicolle and *E. sheathiana* Maiden. We have chosen to accept the phrase name *E. sp.* North Balladonia (D. Nicolle & M. French DN 3620) for this taxon as the representative specimen for this phrase name has duplicates in other herbaria and we are familiar with the population representative of this phrase name in the field.

We therefore recommend that the phrase name *E. sp.* Zanthus (R. Davis 10360) be removed from Western Australia's plant census (Western Australian Herbarium 1998–) and that specimens filed under this name be included in *E. sp.* North Balladonia (D. Nicolle & M. French DN 3620).

***Eucalyptus vegrandis* subsp. Fine leaf (P.J. White 452)**

Voucher specimen. WESTERN AUSTRALIA: Nature Reserve 9648, 1.7 km S of Black road along Buckering road, Wagin, 4 Mar. 1993, *P.J. White* 452 (PERTH).

Euclyptus vegrandis L.A.S.Johnson & K.D.Hill subsp. Fine leaf was based on a specimen determined as *E. orthostemon* D.Nicolle & Brooker (see Nicolle & Brooker 2005) by D. Nicolle in August 2002 (determinavit label on the specimen), and cited as a 'selected specimen' in its original description by Nicolle and Brooker (2005). We are unaware who originally coined the phrase name, but it appears to have been coined prior to the description of *E. orthostemon*, and the original concept of the phrase name, although unknown, may have been similar to that of *E. orthostemon*.

We therefore recommend that the phrase name *E. vegrandis* subsp. Fine leaf (P.J. White 452) be removed from Western Australia's plant census (Western Australian Herbarium 1998–) and that specimens filed under this name be included in *E. orthostemon*.

Phrase names we accept as possible or certain undescribed taxa

***Corymbia sp.* Prince Regent River (R.L. Barrett & M.D. Barrett RLB 3750)**

Voucher specimen. WESTERN AUSTRALIA: 'Isoetes Creek' (informal name), W of Quail Creek, 15.9 km SSE of Kings Cascade S, Prince Regent River Reserve, 22 Jan. 2007, *R.L. Barrett & M.D. Barrett* RLB 3750 (PERTH).

Notes. This phrase name represents populations of a paper-fruited bloodwood occurring in remote and fairly inaccessible areas of the west Kimberley between Walcott Inlet and the Prince Regent River. One of us (DN) has collected specimens matching *R.L. Barrett & M.D. Barrett* RLB 3750 from sandstone hills and ridges to the north-east of Walcott Inlet, on Mount Daglish (*D. Nicolle* 5814) and in the upper reaches of the Calder River (*D. Nicolle* 5817). At these localities, the plants are mostly smooth-barked small trees with slightly glossy, green, glabrous to sparsely setose leaves, which match *Corymbia clavigera* (Schauer) K.D.Hill & L.A.S.Johnson in habit, bark, leaf and general inflorescence morphology, as circumscribed by Hill and Johnson (1995). These populations differ from 'typical' *C. clavigera* (which occurs to the north, from Augustus Island to the Mitchell Plateau) in their smaller fruits on much shorter pedicels, and as such may represent an undescribed taxon.

Corymbia sp. Yampi Peninsula (R.L. Barrett & A.N. Start RLB 2280)

Voucher specimen. WESTERN AUSTRALIA: Saddle Hill, flat-topped mesa (above mudflats on W side), SW of Kimbolton Homestead, Yampi Peninsula, Yampi Sound Defence Training Area, Western Australia, 13 Mar. 2001, *R.L. Barrett* 2280 & *A.N. Start* (PERTH).

Notes. We have not seen plants attributable to this phrase name in the field; the only specimen we have seen is the representative specimen, collected from north of Derby in the Kimberley region of Western Australia, consisting of one branchlet with leaves and mature fruits with seeds and an inflorescence branchlet with leaves and old flowers (but no flower buds). The specimen most closely matches *C. cliftoniana* (W.Fitzg.) K.D.Hill & L.A.S.Johnson, which is widespread but very scattered in north-western Australia (including throughout the southern and eastern Kimberley region), from near Derby in Western Australia to the Victoria River area in the Northern Territory. *Corymbia cliftoniana* is poorly collected, and few collections have mature buds and flowers. It appears to be somewhat variable in morphology and may represent a complex of several taxa (R.L. Barrett pers. com. May 2012). The representative specimen of *C. sp. Yampi Peninsula* differs from typical *C. cliftoniana* most notably in the coarse bristle-hairs on the inflorescence branchlets, peduncles, pedicels and hypathia (adult material of *C. cliftoniana* is glabrous).

Eucalyptus sp. Badgingarra (D. Nicolle & M. French DN 3515)

Voucher specimen. WESTERN AUSTRALIA: NE of Badgingarra, 28 Oct. 2000, *D. Nicolle* 3515 & *M.E. French* (AD, CANB, PERTH).

Synonym. *Eucalyptus falcata* subsp. *opima* D.Nicolle ms (Western Australian Herbarium 1998–).

Notes. This phrase name represents one of several variants previously included in the ‘mallee’ form of *E. falcata*. *Eucalyptus sp. Badgingarra* is of very scattered distribution in a subcoastal north-south strip from southeast of Geraldton southwards to south of Cunderdin in Western Australia, where it usually occurs on or near lateritic breakaways or rises, often in low heath vegetation. It is a mallee with weakly pendulous inflorescences and with relatively short and squat flower buds and fruits. This taxon will be formally described by two of us (DN & MEF) in a paper revising *E. ser. Falcatae* currently in preparation for *Nuytsia*.

Eucalyptus sp. Esperance (M.E. French 1579)

Voucher specimen. WESTERN AUSTRALIA: on track into Mt Ridley, N of Mt Ridley, 11 Jan. 2004, *M.E. French* 1579 (PERTH).

Probable synonym. *Eucalyptus burmanniana* L.A.S.Johnson & K.D.Hill ms. In the absence of a type or reference specimen, and considering that both authors of this manuscript name are deceased, we cannot with certainty determine the concept of this name.

Notes. This phrase name represents a variant of *E. phenax* Brooker & Slee occurring on the Esperance plains from north-west of Esperance eastwards towards Mt Ragged, where it often occurs as an understorey species to larger mallee and tree species. *Eucalyptus sp. Esperance* appears to have consistently bluer adult leaves and somewhat larger buds and fruits than *E. phenax* occurring elsewhere. Although its distinctiveness from variants of *E. phenax* occurring elsewhere appears to be slight, we nevertheless regard that it may represent an undescribed taxon.

***Eucalyptus* sp. Fraser Range (D. Nicolle 2157)**

Voucher specimen. WESTERN AUSTRALIA: Eyre Hwy between Balladonia Roadhouse and Fraser Range, 11 Apr. 1998, *D. Nicolle* 2157 (PERTH).

Probable synonyms. *Eucalyptus aperticoma* L.A.S.Johnson & K.D.Hill ms (Western Australian Herbarium 1998–); *Eucalyptus clancularia* L.A.S.Johnson & K.D.Hill ms (Western Australian Herbarium 1998–, as *E. clancularia* D.Nicolle).

Notes. This manuscript name is erroneously listed as *Eucalyptus clancularia* D.Nicolle ms on the *Australian Plant Name Index* (Centre for Australian National Biodiversity Research 199–) and on *FloraBase* (Western Australian Herbarium 1998–). In the absence of a type or reference specimen, and considering that both authors of this manuscript name are deceased, we cannot with certainty determine the concept of either of these manuscript names.

This phrase name represents one of several imperfectly understood variants of *E. rigidula*. *Eucalyptus* sp. Fraser Range appears to be restricted to sites associated with rocky outcrops (e.g. Disappointment Rock, Cave Hill and Newman Rock); however its distributional limits are currently poorly understood. It can be distinguished from *E. rigidula* by its narrow juvenile leaves, narrow adult leaves, small buds with relatively long, beaked opercula, and small fruits. Both *E. sp. Fraser Range* and *E. rigidula* are members of *E. ser. Porantherae*, in which a number of potentially undescribed taxa have been identified and which is the subject of an extensive and long-term taxonomic study by two of us (DN & MEF) and Ian Brooker.

***Eucalyptus* sp. Great Victoria Desert (D. Nicolle & M. French DN 3877)**

Voucher specimen. WESTERN AUSTRALIA: 31.1 km S of Dundas Nature Reserve boundary gate with Southern Hills Station on the Fraser Range – Mt Ridley track, 18 Jul. 2001, *D. Nicolle* 3877 & *M. French* (AD, CANB, PERTH).

Synonym. *Eucalyptus oblivialis* D.Nicolle ms (Western Australian Herbarium 1998–).

Notes. This phrase name represents a variant of *E. leptophylla* from the Great Victoria Desert of South and Western Australia and adjacent areas. The representative specimen is from outside this ‘core’ area but nevertheless generally matches the morphology of specimens from the Great Victoria Desert. The morphology and particularly the distribution of *E. sp. Great Victoria Desert* is currently poorly understood; however, both its morphology and distribution appears to be somewhat intermediate between *E. leptophylla* (mainly distributed in eastern Australia) and *E. horistes* (from the wheatbelt and goldfields of Western Australia). *Eucalyptus* sp. Great Victoria Desert, *E. leptophylla* and *E. horistes* are members of *E. ser. Porantherae*, in which a number of potentially undescribed taxa have been identified and which is the subject of an extensive and long-term taxonomic study by two of us (DN & MEF) and Ian Brooker.

***Eucalyptus* sp. Kalbarri (M.I.H. Brooker 7937)**

Voucher specimen. WESTERN AUSTRALIA: 15 km N of Yuna road on Wandana road, 25 Jan. 1983, *M.I.H. Brooker* 7937 (CANB, PERTH).

Notes. This phrase name represents one of several imperfectly understood variants of *E. rigidula*. *Eucalyptus* sp. Kalbarri occurs in the northern wheatbelt and adjacent sand plains of Western Australia, from the Wongan Hills area north to Kalbarri National Park, where it occurs on sandplains or lateritic hills. It can be distinguished from *E. rigidula* by its relatively short, broad and dull seedling leaves. The buds and fruits may also be larger than in *E. rigidula*. A description and representative photographs of *E. sp. Kalbarri* can be found in Slee *et al.* (2006). Both *E. sp. Kalbarri* and *E. rigidula* are members of *E. ser. Porantherae*, in which a number of potentially undescribed taxa have been identified and which is the subject of an extensive and long-term taxonomic study by two of us (DN & MF) and Ian Brooker.

***Eucalyptus* sp. Little Sandy Desert (D. Nicolle & M. French DN 4304)**

Voucher specimen. WESTERN AUSTRALIA: Wiluna to Granite Peak road, transmission tower near Camel Well, 27 Nov. 2001, D. Nicolle 4304 & M. French (AD, CANB).

Synonyms. *Eucalyptus oldfieldii* subsp. *paupera* D. Nicolle ms (Western Australian Herbarium 1998–); *Eucalyptus oldfieldii* subsp. *nana* D. Nicolle ms (Western Australian Herbarium 1998–).

Notes. This phrase name represents a variant of *E. oldfieldii* with narrower juvenile leaves and smaller adult leaves, flower buds and fruits than the typical variant of the species. This variant occurs in parts of the Little Sandy, Gibson and Great Victoria Deserts, to the north and east of the typical subspecies. This variant is being formally described as a subspecies of *E. oldfieldii* by two of us (DN & MEF) in a paper currently in preparation for *Nuytsia*.

***Eucalyptus* sp. Mulga Rock (K.D. Hill & L.A.S. Johnson KH 2668)**

Voucher specimen. WESTERN AUSTRALIA: 4.4 km N of Mulga Rock on Lake Minigwal track, 29 Nov. 1986, K. Hill 2668 & L.A.S. Johnson (NSW, PERTH).

Synonyms. *Eucalyptus* sp. *Undulans* (J.R. Connors 1004 & D. Nicolle) (Slee *et al.* 2006); *Eucalyptus* sp. Lake Minigwal (D. Nicolle 2720 & J.R. Connors), (Centre for Australian National Biodiversity Research (1991–)); *Eucalyptus* sp. *S* (Brooker & Kleinig 2001).

Probable synonym. *Eucalyptus undulans* L.A.S. Johnson ms. In the absence of a type or reference specimen, and considering that the author of this manuscript name is deceased, we cannot with certainty determine the concept of this manuscript name.

Notes. This phrase name represents an apparently undescribed member of *E. ser. Porantherae* occurring in the Lake Minigwal area in the far south-western part of the Great Victoria Desert. *E. sp. Mulga Rock* is imperfectly understood, but appears to be most closely related to *E. formanii* C.A. Gardner, from which it can be distinguished by its completely smooth bark, coarser seedling leaves and broader (but still near-linear) adult leaves. A description and representative photographs of *E. sp. Mulga Rock* can be found in Brooker and Kleinig (2001: 310 as *E. sp. S*) and Slee *et al.* (2006; as *E. sp. Undulans*). Both *Eucalyptus* sp. Mulga Rock and *E. formanii* are members of *E. ser. Porantherae*, in which a number of potentially undescribed taxa have been identified and which is the subject of an extensive and long-term taxonomic study by two of us (DN & MF) and Ian Brooker.

***Eucalyptus* sp. North Balladonia (D. Nicolle & M. French DN 3620)**

Voucher specimen. WESTERN AUSTRALIA: 87.0 km N of Balladonia Roadhouse on Zanthus track, 8 Nov. 2000, D. Nicolle 3620 & M.E. French (AD, CANB, PERTH).

Synonym. *Eucalyptus bolida* D.Nicolle ms (Western Australian Herbarium 1998–).

Notes. This phrase name represents populations of mallees of *E. ser. Rufispermae* occurring between Balladonia and Zanthus, which have at least superficial similarities to *E. assimilans*, *E. gypsophila* and *E. sheathiana*. These populations have at times been included in *E. sheathiana*, a well-circumscribed species from the central wheatbelt of Western Australia. Populations of *E. sp. North Balladonia*, and individuals within the populations, are quite variable in morphology and as such have been difficult to circumscribe. The high degree of variation may be indicative of an intergrading zone between *E. assimilans* (which occurs to the south) and *E. gypsophila* (which occurs further north), or the populations may represent an apparently unnamed taxon of unresolved affinity.

***Eucalyptus* sp. Pitta Creek (R.L. Barrett & M.D. Barrett RLB 1677)**

Voucher specimen. WESTERN AUSTRALIA: sandstone pavement N of Leptospermum Falls (informal name), 5.0 km E of junction of Pitta Creek and Prince Regent River, 10 Jan. 2001, R.L. Barrett & M.D. Barrett RLB1677 (PERTH).

Notes. We have not seen plants attributable to this phrase name in the field. The representative specimen consists of a single branch with adult leaves and mature fruits (and no flower buds). We have not seen any other specimens which have been attributed to this phrase name. The specimen appears to match *E. herbertiana* Maiden, a widespread and somewhat variable species in the region. *Eucalyptus* sp. Pitta Creek is known from only a single population growing on a sandstone massif less than two kilometres across, where it co-occurs with *E. herbertiana* (R.L. Barrett & M.D. Barrett, pers. comm. Oct 2011). *Eucalyptus* sp. Pitta Creek differs from *E. herbertiana* in its smaller leaves and flower buds and smaller fruit on slender pedicels that are distinct from the base of the fruit (R.L. Barrett & M.D. Barrett, pers. comm. Oct 2011).

We have reservations as to the status of *E. sp. Pitta Creek* and its relationship to, and distinctiveness from, *E. herbertiana*. However, we tentatively retain this phrase name at this time on the basis of discussions with Russell and Matt Barrett and considering we have not seen plants in the field.

***Eucalyptus* sp. Point Hillier (D. Nicolle & M. French DN 3759)**

Voucher specimen. WESTERN AUSTRALIA: Point Hillier, NE ridge, WSW of Denmark, 28 Jan. 2001, D. Nicolle 3759 & M.E. French (CANB, PERTH).

Synonym. *Eucalyptus kynoura* D.Nicolle ms (Western Australian Herbarium 1998–).

Notes. This phrase name represents a variant of *E. goniantha* Turcz. which is known from a single population on a very steep, crumbling limestone slope at Point Hillier, west of Denmark on the far south coast of Western Australia. The taxon differs from *E. goniantha* (which occurs further east, from Mutton Bird Island to near Manypeaks township) in its strongly ribbed flower buds and fruits.

This variant will be formally described by two of us (DN & MEF) in a paper revising *E. ser. Falcatae* currently preparation for *Nytsia*.

***Eucalyptus* sp. Truslove (M.I.H. Brooker 7499)**

Voucher specimen. WESTERN AUSTRALIA: 6.7 km W of Hwy 1 on Briggs Road, SW of Truslove, 2 May 1982, *M.I.H. Brooker* 7499 (CANB, PERTH).

Probable synonym. *Eucalyptus dissimulata* subsp. *plauta* L.A.S.Johnson & K.D.Hill ms (Western Australian Herbarium 1998—). In the absence of a type or reference specimen, and considering that both authors of this manuscript name are deceased, we cannot with certainty determine the concept of this manuscript name.

Notes. This phrase name represents a variant of *E. dissimulata* Brooker. *Eucalyptus* sp. Truslove can be distinguished from *E. dissimulata* by its duller, slightly blue-green adult leaves (glossy and green in typical *E. dissimulata*). Its distribution is not fully understood, but the variant appears to be restricted to the Esperance sandplains. Both *E. sp. Truslove* and *E. dissimulata* are members of *E. ser. Porantherae*, in which a number of potentially undescribed taxa have been identified and which is the subject of an extensive and long-term taxonomic study by two of us (DN & MEF) and Ian Brooker.

New phrase names erected here

***Eucalyptus* sp. Dartmoor (D. Nicolle & M. French DN 5585)**

Voucher specimen. WESTERN AUSTRALIA: Dartmoor Rd near Dartmoor homestead, 30 Mar. 2010, *D. Nicolle* 5585 & *M. French* (AD, CANB, PERTH).

Notes. This phrase name represents a member of *E. ser. Ovulares* Brooker occurring on Dartmoor Station about 100 km north-east of Geraldton in Western Australia, where it is known over a linear range of about 10 km. The taxon has an affinity to *E. aequiperta* Brooker & Hopper, *E. baudiniana* Carr & Carr and *E. myriadena* Brooker (none of which occur within 100 km of Dartmoor) and differs from these species in a combination of characters, including the slightly constricted flower bud hypanthium and the obconical fruits. *Eucalyptus* sp. Dartmoor (D. Nicolle & M. French DN 5585) occurs as trees forming open woodland on a plain of red loam.

***Eucalyptus* sp. Dunbar Road (D. Nicolle & M. French DN 5466)**

Voucher specimen. WESTERNAUSTRALIA: Dunbar Rd, SE of Marvel Loch, 20 Mar. 2010, *D. Nicolle* 5466 & *M. French* (CANB, PERTH).

Notes. This phrase name represents a variant of *E. urna* D.Nicolle, differing from that species most distinctively in its more colourful (coppery orange to tan) and uniformly-coloured bark and the smaller, consistently smooth fruits. The variant is only known along Dunbar Road, south-east of Marvel Loch in Western Australia (at the northern end of the distribution of *E. urna*), where it occurs in even-aged mallet woodlands on red clay-loams.

Eucalyptus sp. Lake Magenta (D. Nicolle & M. French DN 5509)

Voucher specimen. WESTERN AUSTRALIA: W of Reserve Rd on 'Moon Lagoon' track, 23 Mar. 2010, D. Nicolle 5509 & M. French (CANB, PERTH).

Notes. This phrase name represents a mallee taxon with an affinity to *E. captiosa* Brooker & Hopper and *E. incrassata* Labill., differing from these species most distinctively in its smaller, completely smooth, cupular fruits on short peduncles and pedicels. The fruits have little resemblance to any other member of the *E. incrassata* species complex. The taxon is common on pure white sand overlaying clay at some depth, south of Lake Magenta where it forms large areas co-dominant with *E. sp.* Sullivan Soak (D. Nicolle & M. French DN 5503). The distribution of the taxon is otherwise poorly understood. A population of mallees attributable to *E. sp.* Lake Magenta has also been collected from north of Lake Grace.

Eucalyptus sp. Mt Short (D. Nicolle & M. French DN 3575)

Voucher specimen. WESTERN AUSTRALIA: near Mt Short, N of Ravensthorpe, 5 Nov. 2000, D. Nicolle 3575 & M.E. French (CANB, PERTH).

Notes. This phrase name represents a variant of *E. uncinata* Turcz., differing from that species in its much thicker and firmer adult leaves and its larger flower buds and fruits. The variant grows in mallee shrubland on hills of laterite, and is only known from the northern part of the Ravensthorpe Range, especially in the vicinity of Mt Short but also at Overshot Hill. Both *E. sp.* Mt Short and *E. uncinata* are members of *E. ser. Porantherae*, in which a number of potentially undescribed taxa have been identified and which is the subject of an extensive and long-term taxonomic study by two of us (DN & MEF) and Ian Brooker.

Eucalyptus sp. Queen Victoria Spring (D. Nicolle 524)

Voucher specimen. WESTERN AUSTRALIA: 7.9 km N of Mulga Rockhole, 30 Sep. 1993, D. Nicolle 524 (PERTH 05315514).

Notes. This phrase name represents a mallee taxon with an affinity to *E. ceratocorys* (Blakely) L.A.S.Johnson & K.D.Hill and *E. capitanea* L.A.S.Johnson & K.D.Hill occurring on yellow sand in an area in the far south-western part of the Great Victoria Desert of Western Australia, centered on Queen Victoria Spring. The taxon has been included in *E. ceratocorys* by Brooker and Kleinig (2001) and Slee *et al.* (2006; who also included *E. capitanea* in *E. ceratocorys*). *Eucalyptus sp.* Queen Victoria Spring can be distinguished from *E. ceratocorys* (an endemic to the northern wheatbelt of Western Australia) in its shorter and narrower adult leaves and smaller fruits. It differs from *E. capitanea* (a South Australian endemic occurring in the far southern Great Victoria Desert), in its smaller and narrower adult leaves, longer pedicels, and smaller, less ribbed fruits.

Eucalyptus sp. Southern wheatbelt (D. Nicolle & M. French DN 5507)

Voucher specimen. WESTERN AUSTRALIA: Mallee Rd, N of Reserve Rd [E of Lake Magenta], 23 Mar. 2010, D. Nicolle 5507 & M. French (PERTH).

Notes. We have erected this phrase name to accommodate populations of mallees with an affinity to *E. leptocalyx* Blakely from the southern wheatbelt of Western Australia, which were previously but erroneously called *E. scyphocalyx* (F.Muell ex. Benth.) Maiden & Blakely (e.g. in Chippendale 1988, Brooker & Kleinig 2001 and Slee *et al.* 2006). A description and representative photographs of *E. sp.* Southern wheatbelt can be found in Brooker and Kleinig (2001: 377) and Slee *et al.* (2006; as *E. scyphocalyx*).

Eucalyptus scyphocalyx was described from material collected at Eyre's Relief Camp, which we believe is near Point Culver on the south coast of Western Australia. We now regard this species to be distributed between Israelite Bay and Toolinna Cove (see below). *Eucalyptus scyphocalyx* is most closely related to *E. merrickiae* Maiden & Blakely, and together these two species constitute *E. ser. Merrickianae* Chippendale. *Eucalyptus scyphocalyx* differs from *E. merrickiae* in its broader juvenile and adult leaves, mostly 7-flowered inflorescences, and larger flower buds and fruits. Brooker and Hopper (1993) described *E. surgens* Brooker & Hopper from a single population at Toolinna Cove. Field studies by two of us (DN & MEF) have concluded that *E. surgens* occurs commonly from Toolinna Cove to Israelite Bay, especially on sandy soils adjacent to barrier salt lakes, and includes the type of *E. scyphocalyx*. Thus we consider *E. surgens* to be a taxonomic synonym of *E. scyphocalyx*.

Eucalyptus sp. Southern wheatbelt belongs in *E. ser. Furfuraceae* Brooker, along with *E. leptocalyx* and *E. platycorys* Maiden & Blakely. *Eucalyptus sp.* Southern wheatbelt is most closely related to *E. leptocalyx*, but can be distinguished from the latter most easily by its cupular fruits (fruits barrel-shaped in *E. leptocalyx*) among a number of more subtle characteristics. *Eucalyptus sp.* Southern wheatbelt (*E. ser. Furfuraceae*; which has scurfy, non-pitted seeds) is more distantly related to *E. scyphocalyx* and *E. merrickiae* (*E. ser. Merrickianae*; characterised by its deeply pitted seeds).

***Eucalyptus sp. Sullivan Soak* (D. Nicolle & M. French DN 5503)**

Voucher specimen. WESTERN AUSTRALIA: Mallee Rd, N of Reserve Rd [E of Lake Magenta], 23 Mar. 2010, D. Nicolle 5503 & M. French (AD, CANB, NSW, PERTH).

Notes. This phrase name represents a member of *E. ser. Porantherae* from the Lake Magenta area in Western Australia. *Eucalyptus sp. Sullivan Soak* has affinities to *E. latens* Brooker and is distinctive in the field with its very fine crown of short and very narrow adult leaves and small flower buds and fruits. The seedling leaves are very small, elliptical in shape, greyish and waxy. The taxon has been collected at a number of sites in Lake Magenta Nature Reserve (e.g. Sullivan Soak and on the western and southern margins of Lake Magenta) and in areas to the south-east of the reserve. At all sites it occurs on pure white sand over clay soils. Both *E. sp. Sullivan Soak* and *E. latens* are members of *E. ser. Porantherae*, in which a number of potentially undescribed taxa have been identified and which is the subject of an extensive and long-term taxonomic study by two of us (DN & MEF) and Ian Brooker.

Eucalyptus sp. Sullivan Soak has been known in cultivation since the 1990's under the name *Eucalyptus* 'Moon Lagoon'. We are unaware who coined the name, or why, although the taxon is the dominant species in the vicinity of a crescent-shaped salt lake with a distinctive lunette just east of Lake Magenta Nature Reserve.

Eucalyptus sp. **Point Malcolm (D. Nicolle & M. E. French DN 6011)**

Voucher specimen. WESTERN AUSTRALIA: 1.5 km S of Fisheries Rd on Point Malcolm Rd, 7 Apr. 2011, D. Nicolle 6011 & M.E. French (AD, CANB, NSW, PERTH).

Notes. This phrase name represents a variant of *E. kessellii* Maiden & Blakely known only from near Tookle-Jenna Rock, about 15 km south-west of Israelite Bay on the south coast of Western Australia. The taxon differs from both recognised subspecies of *E. kessellii* (subsp. *kessellii* and *eugnota* L.A.S. Johnson & K.D.Hill) in its obligate seeder regenerative strategy, waxy branchlets, juvenile leaves and new adult laves, and the larger, waxy flower buds and fruits.

This new taxon is being treated in a revision of *E. series Falcatae* currently in preparation by two of us (DN & MEF).

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