Eucalyptus synandra (Myrtaceae), a new species of mallee from Western Australia

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Abstract

Crisp, M.D. *Eucalyptus synandra,* (Myrtaceae) a new species of mallee from Western Australia. Nuytsia 4(1): 129-134 (1982). A new Western Australian species, *Eucalyptus synandra,* is described from a few populations scattered from near Morawa to the Great Victoria Desert. It is distinguished by its stamens being united into a tube, by its non urceolate fruit which is usually grooved between disc and hypanthium and by its long (7-15 mm) fruiting pedicel. A lectotype is chosen for its near relative, *E. leptopoda* Benth.

Eucalyptus synandra Crisp, sp. nov. (Figure 1)

Frutex ad *E. leptopodam* arte cognatus sed propter filamenta longiora in tubum connata, flores pendentes, alabastra operculo longiore (10-20 mm), pedicellos longiores (7-15 mm), fructum plerumque sulco inter hypanthium discumque, valde differt. *Eucalyptus synandra* ad *E. beardianam* etiam accedit, sed propter folia juvenales ad basin attenuata nec rotundata et hypanthium fructus depressum-hemisphaericum nec cupulatum-urceolatum facile dignoscenda.

Typus : ± 5 km S of Jingymia, 30°31'S, 117°25'E, 2 Jan. 1981, *A. S. George* 16203, fl., fr., photo, spirit material (holo : PERTH; iso : CBG, FRI, K, NSW, PERTH).

Mallee 2-6 m tall, with erect or pendulous branchlets; *bark* smooth, white to grey. *Cotyledons* bisected; petiole 2-3 mm long; lobes 3-4 mm long. *Juvenile leaves* opposite only for 1-4 pairs, linear- to narrow-ovate, with slightly recurved margins, tapering to a short petiole, 15-90 x 2-15 mm, dull, grey-green, paler beneath; seedling stem tuberculate. *Adult leaves* not opposite, linear or rarely narrow-elliptic, tapering gently to both ends, uncinate, 40-200 x 4-15 mm; *veins* and *glands* obscure on dried specimens; *petiole* 3-15 mm long. *Unit inflorescences* axillary, 7-flowered. *Peduncle* decurved, terete, slender, 9-18 mm long. *Mature buds* ovoid to conical, 15-25 mm long; *hypanthium* depressed-hemispherical, much broader than long; *operculum* 10-20 mm long, attenuated into a long, sometimes filiform beak; *pedicel* filiform, 7-15 mm long. *Flowers* pendulous. *Androecium* united in a tube by filaments in lower 1/3 to 2/3 but sometimes with a few outermost filaments free almost to base, shed intact, creamy yellow at anthesis, becoming pink or red with age. *Inner filaments* shorter than outer filaments, inflexed in bud. *Anthers* versatile, obloid-globular, c. 0.7 mm long. *Style* slender, more or less reaching inner tip of operculum beak in bud. *Ovary* 4-7-locular. *Fruit* 9-14 mm diam.; *hypanthium* depressed-hemispherical, 3-5 mm long; *disc* narrower, truncate-conical, steep-sided, 2-5 mm high; *operculum scars* and *staminophore* usually in a groove between hypanthium rim and disc; *valves* exserted. *Seed* irregularly compressed-ovoid, with acute margins, pale brown, semi-lustrous, finely reticulate with shallow pits, dorsally rounded, ventrally angular; *hilum* inconspicuous.

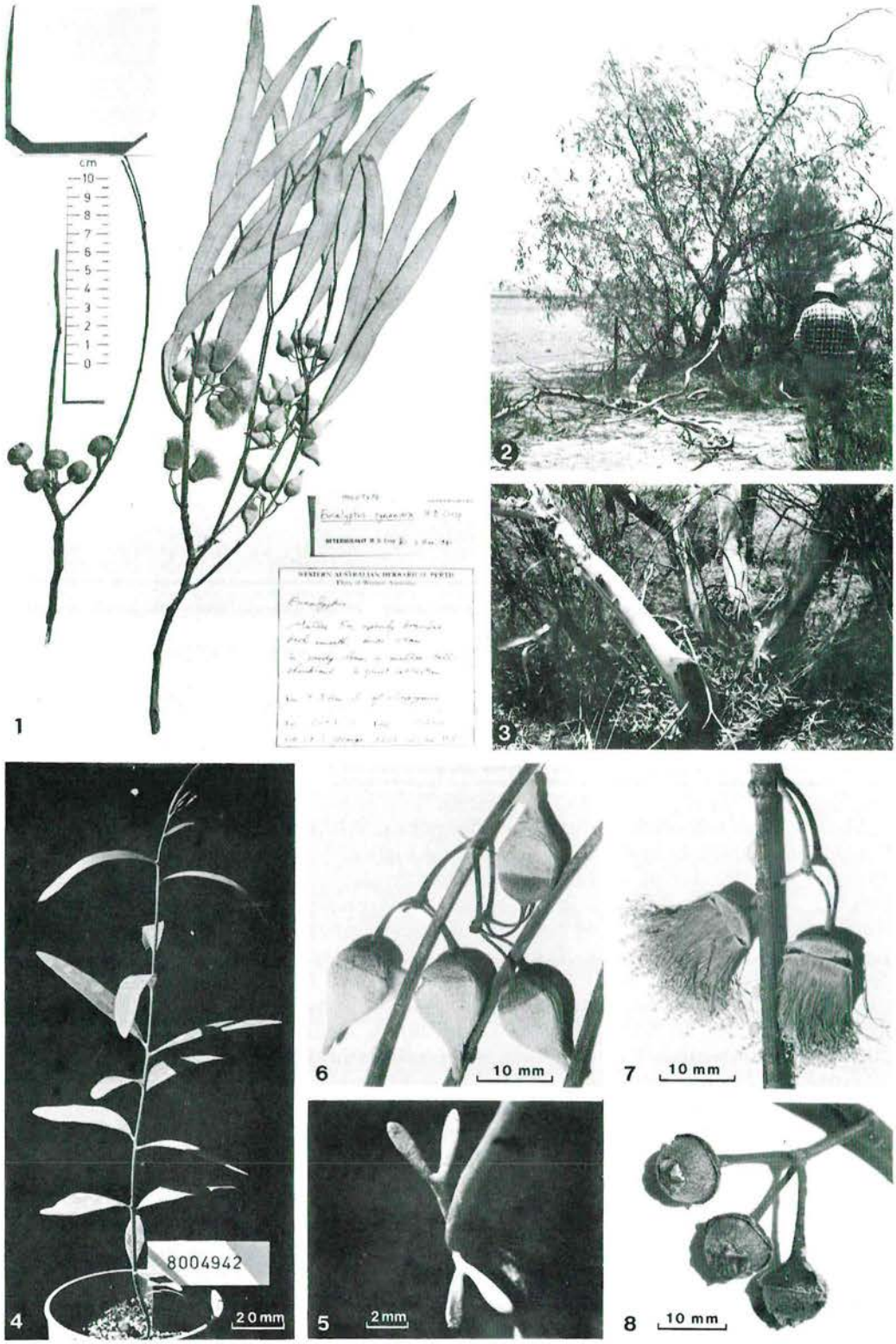

Figure 1. *Eucalyptus synandra* 1—Holotype specimen, *A. S. George* 16203. 2—Plant near Jingymia from which type was collected (photo by A. S. George). 3—Stems and bark (photo by A. S. George). 4—Seedling, from *M. D. Crisp* 6693. 5—Cotyledons, from *M. D. Crisp* 6693. 6—Buds, from holotype. 7—Flowers showing connate filaments, from holotype. 8—Fruits, from *M. D. Crisp* 6693.

Distribution.(Figure 2) Western Australia : about six known populations scattered from the southern Great Victoria Desert to north of Koorda, Mt Gibson and north of Morawa.

Habitat. Eucalyptus synandra usually grows on laterite or on ironstone ridges, but one collection (*Hallberg* S4671) is from sand. It typically occurs in small stands. At the type locality the substrate is a pale cemented soil with ironstone nodules, weathering to a sandy loam, and the vegetation is a tall shrubland of *Acacia* sp.

Selected collections (21 seen). WESTERN AUSTRALIA: In arenosis saxosis prope montem Gibson, Oct. 1968, *C. A. Gardner* s.n. (Perth); 6.5 miles [10.4 km] E of Gutha, *H. Demarz* 1449 (PERTH); 5.5 km S of Jingymia, *M. D. Crisp* 6693-6 (CBG, FRI, NSW, PERTH); near Kulja, *C. A. Gardner* 12100 (PERTH); 200 km SE of Laverton, 37 km E of Dead Horse Soak, *J. Hallberg* S4671 (FRI); 15 miles [24 km] S of Queen Victoria Springs, *R. D. Royce* 5286 (PERTH); 52 miles [83 km] N of transline [transcontinental railway line] road from a point 13 miles [21 km] E of Kitchener, *Forester Brennan* K 133 (PERTH).

Affinities. Eucalyptus synandra belongs to the informal section Bisectaria subseries Leptopodinae of Pryor and Johnson (1971), within which it is best placed between *E. leptopoda* Benth. (code SIVAA) and *E. beardiana* Brooker et Blaxell (code SIVAB). Unfortunately no code is available in that position in Pryor and Johnson's classification.

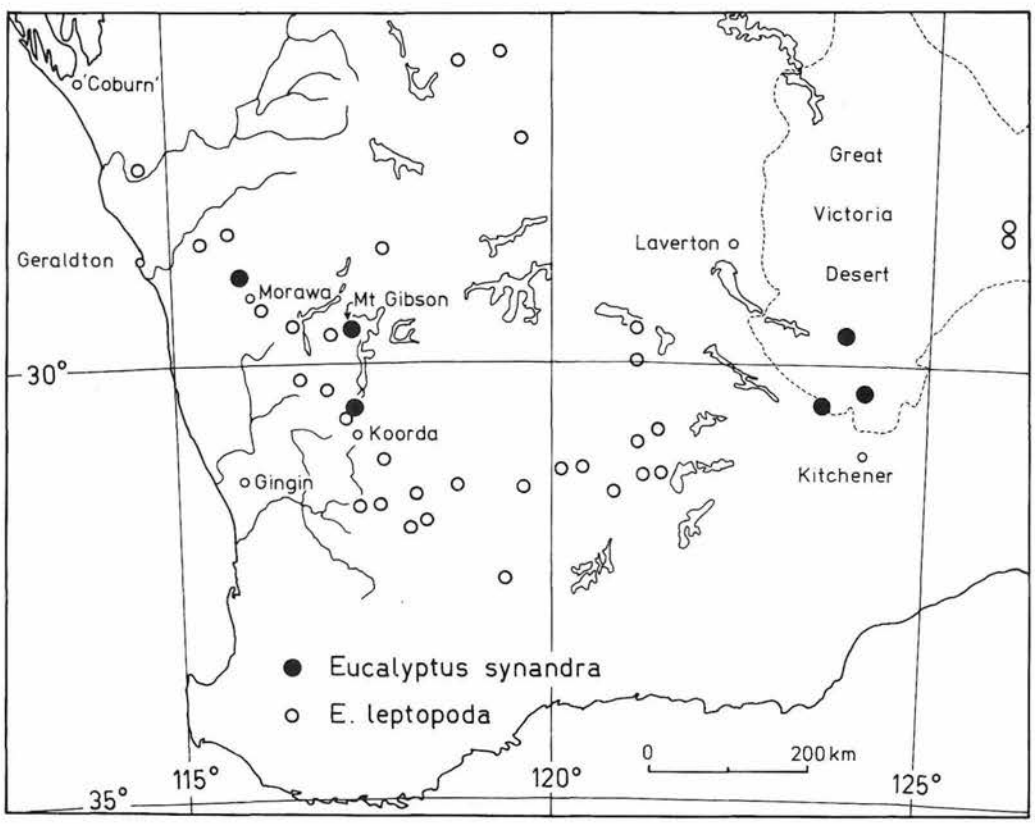

Figure 2. Distribution of *Eucalyptus synandra* and *E. leptopoda*.

Table 1 gives diagnostic characters separating these three species. The most striking character of *E. synandra*, its connate androecium (Figure 1), at once separates it from *E. leptopoda*. Brooker and Blaxell (1978) report a population of *E. leptopoda* with united stamens, but the specimen (*R. D. Royce* 5286) on which the report is based (M. I. H. Brooker, personal communication) belongs to *E. synandra*. The type population of *E. beardiana* at "Coburn" Station also has united stamens (Brooker and Blaxell, 1978). Within *Eucalyptus* this character is restricted to these two species, and is clearly a derived condition. However, the central population of *E. beardiana*, at "158 km peg, N of Geraldton on Highway 1", appears to have stamens which are free to the base, as seen on old flowers attached to the specimen *M. I. H. Brooker* 5023 (FRI, NSW). These flowers were collected from the ground but almost certainly had fallen from the plant from which the specimen was taken (D. F. Blaxell, personal communication). There is a third population of *E. beardiana* at "158 km N of Gingin on Highway 1", but the only specimen, L. D. Pryor s.n., 28 June 1978 (FRI), lacks flowers. The similarity between the localities cited for the central and southern populations is coincidental. It is apparent that the variation of the androecium of *E. beardiana* needs to be investigated further.

Table 1. Diagnostic characters of *Eucalyptus synandra, E. leptopoda* and *E. beardiana*

	E. synandra	*E. leptopoda*	*E. beardiana*
Stamens	All except outermost coherent in a tube for lower 1/2 to 2/3.	Free to base.	Type population: united in a tube. Central population: free to base. Southern population: unknown.
Operculum length (mm)	12.9 ± 2.6[1] (n = 9)[2] shortest measured 10.3	5.9 ± 1.0 (n = 12) longest measured 8.1	13.3 ± 1.3 (n = 20)[3]
Juvenile leaves	Tapering to petiole, grey-green.	Tapering to petiole, grey-green.	Rounded at base, green.
Soil	Usually outcropping laterite, rarely sand.	Deep, usually yellow sand.	Sand, usually dunes.
Fruiting pedicel length (mm)	10.8 ± 1.8 (n = 15) shortest measured 7.3	4.5 ± 1.1 (n = 44) Longest measured 7.7	—
Ratio—pedicel length: hypanthium length	3.2 ± 0.7 (n =15) lowest 2.2	1.1 ± 0.2 (n = 44) highest 2.2	—
Fruit diameter (mm)	10.1 ± 1.5 (n = 15)	8.0 ± 1.0 (n = 44)	10.9 ± 0.9 (n = 29)[4]
Fruit shape	Hypanthium depressed-hemispherical, not constricted; disc truncate-conical, steep-sided; usually hypanthium rimmed, with a groove between it and disc.	Hypanthium hemispherical; disc from flat to broadly convex; when disc strongly convex, fruit not or slightly rimmed or grooved.	Hypanthium cupular-urceolate (constricted just below rim); disc slightly depressed to slightly convex.

1. Standard deviation.
2. Except where otherwise indicated (below), each datum is an average of ten measurements from a single specimen.
3. Twenty measurements from one specimen from the type locality. A specimen from the central locality had much shorter buds but was not measured.
4. Twenty nine measurements from four specimens.

Eucalyptus beardiana is readily separated from *E. synandra* and *E. leptopoda* by its urceolate fruits and by its juvenile leaves being green and being rounded at the base (Table 1). Also, the adult leaves of *E. beardiana* contract abruptly to the petiole by contrast with the gently tapering leaves of *E. synandra* (Figure 1) and *E. leptopoda*. *Eucalyptus leptopoda* resembles *E. synandra* very closely, especially in vegetative morphology, but a combination of fruit morphology, length of pedicel, ratio of pedicel to hypanthium length and soil of the habitat will serve to separate non-flowering material of these species (Table 1).

Variation. There is slight geographic variation in the morphology and habitat of *Eucalyptus synandra*. Plants from the vicinity of the Great Victoria Desert have erect non-glaucous branchlets and in places may grow in sand, whereas plants from all populations farther west, including the type, have pendulous glaucous branchlets and always grow on laterite or ironstone hills. However, I am reluctant to propose formal infra-specific taxa before the species is known better. It is worth noting that the peduncles of *E. synandra* always appear to be decurved such that the flowers are pendulous, irrespective of the orientation of the branchlet. Thus the peduncles are recurved away from the tips of the erect branchlets in the Great Victoria Desert populations, whereas in the western populations they have the same direction as the pendulous branchlet tips.

Eucalyptus leptopoda Benth., *Fl. Austral.* 3: 238 (1867).

Type citation: "W. Australia, *Drummond,* 5th Coll. Suppl. n. 33 and 36, also n. 151 and 188 of other sets".

Lectotype (here designated): *Drummond* 5th Coll. Suppl. no. 33 (K; iso: BM, CGE, E, FI, K, KW, LE, MEL, NSW, PERTH, W). The chosen sheet is labelled, in part, "33 J. Drummond S.W. Australia 1850" and stamped "Herbarium Hookerianum 1867".

E. angustifolia Turcz., Bull. Phys. Math. Acad. Petersb. 10: 337 (1852), non Desf. (1804). Holotype: "Nova Hollandia Drummond coll: V n. 33" (KW).

A lectotype is chosen here to fix the application of the name of *E. leptopoda* according to current usage. This is necessary because the syntypes no. 151 and 188 belong to *E. salmonophloia* F. Muell. (1878). In fact, Bentham (1867; p. 239) implies that 188 is atypical and cites it and 151 apparently as an afterthought. Only the syntypes *Drummond* 5th Coll. nos. 33 and 36 belong to the species currently regarded as *E. leptopoda*. At K, there are two sheets of *Drummond* 5th Coll. no. 33. The lectotype carries the name "*E. leptopoda* Benth." in Bentham's handwriting, and has an abundance of leaves, fruits and immature buds. By contrast, *Drummond* 5th Coll. no. 36 (K) and the other sheet of *Drummond* 5th Coll. no. 33 in K both have few fruits and are consequently poorer specimens. Mueller (1878; p. 11, 14) excludes *Drummond* 151 and 188 from *E. leptopoda*, assigning them instead to his new species *E. salmonophloia*. He states that he has no specimen of "*Drummond* 36" and implicitly chooses "*Drummond* no. 33" as the type of *E. leptopoda* by citing it alone. This implied lectotypification is not valid because the single sheet of "*Drummond* 33" in MEL carries no indication that Bentham has seen it (*vide* para. 4 (a) under "Guide for the determining of types" in Stafleu et al. (1978)). Maiden

(1912) follows Mueller by including *Drummond* 151 and 188 in *E. salmonophloia* but makes no further attempt to clarify the typification of *E. leptopoda.* I have seen only photographs (at FRI) of the type material, with the exception of the isolectotypes at MEL and NSW, which I have seen.

Eucalyptus leptopoda is variable, especially in its fruit morphology, but is an integral species which cannot be readily subdivided. The disc of the fruit varies from more or less flat in populations south of 30°S to strongly convex further north, but intergradation is continuous between the extremes and the geographic pattern is not entirely consistent (strongly convex fruits have been collected at 32°S).

There is no evidence that *E. leptopoda* intergrades with *E. synandra,* even though the species are sympatric (Figure 2). Typical *Eucalyptus leptopoda* is growing on sand in two populations very close to the type locality of *E. synandra.* One population has its southern boundary only 0.8 km N of the *E. synandra*, and extends c. 1 km northward (B. V. Smith, personal communication). The other population occurs 3.5 km SW from the *E. synandra* and has the erect bushy habit, fruit morphology and short fruiting pedicels typical of *E. leptopoda* (*Crisp* 6697, CBG, FRI, PERTH).

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