

Two new species of *Eucalyptus* (Myrtaceae) from northern New South Wales (series *Viminales* section *Maidenaria*)

John T. Hunter and Jeremy J. Bruhl

Abstract

Hunter, J.T. and Bruhl, J.J. (Botany, University of New England, Armidale, NSW 2351). Two new species of *Eucalyptus* (Myrtaceae) from northern New South Wales (series *Viminales* section *Maidenaria*). *Telopea* 8(2): 257–263. ***Eucalyptus quinniorum*** J.T. Hunter & J.J. Bruhl, a new species from the series *Viminales*, discovered in a survey of granitic outcrops of the New England Batholith, is described. In addition, ***Eucalyptus oresbia*** J.T. Hunter & J.J. Bruhl, another new species, was found while research into the placement of the former species was being conducted and is also described here. Notes are presented on the distribution and conservation status of both species.

Introduction

Vouchers from a survey of the granitic outcrop flora of the New England Batholith by one of us (JTH) revealed some unusual and important plants (Hunter 1996; Hunter et al. 1996; Hunter & Bruhl 1997; Hunter 1997; Richards & Hunter 1997; Hunter 1998; Hunter & Clarke 1998) including an unusual *Eucalyptus* forming stands of mallee on private properties in the Nandewar and Moonbi Ranges of New South Wales. During an assessment of the placement of this taxon within the section *Viminales* it was noted that, in part, a previously described variety of *E. goniocalyx* F. Muell. ex Miq., subsequently placed within the circumscription of *E. cypellocarpa* L.A.S. Johnson warranted specific status. This entity, thus far restricted to Hanging Rock near Nundle, is here described as a new species.

Taxonomy

1. *Eucalyptus quinniorum* J.T. Hunter & J.J. Bruhl, **sp. nov.**

Ab *E. cypellocarpa* habitu minore, foliis juvenalibus petiolati concoloribusque fructus disco plano et valvis exilientibus differt.

Type: New South Wales: Northern Tablelands: 'Bornhardtia' property east of Barraba, below Bald Rock, 30°21' 150°54', J.T. Hunter 8662 & V.H. Hunter, 5 July 1998 (holo NSW; iso BRI, CANB, CHSB, MEL, NE, PERTH).

[*Eucalyptus cypellocarpa* auct. non. L.A.S. Johnson: Boland et al., *Forest Trees of Australia* edn 4: 446 (1984); Chippendale, *Eucalypts, Angophora* (Myrtaceae), *Flora of Australia* 19: 349 (1988); Brooker and Kleinig, *Field Guide to Eucalypts* 1: 200 (1990) p.p.]

Illustration [electronic]: Brooker et al., *EUCLID, Eucalypts of south-eastern Australia* (1997) as '*E. quinniorum* ms'.

Mallee with 5–12 trunks or more rarely a small tree 5–12 (–16) m tall. Bark smooth, shed in long strips, white with grey blotches, a small box sock at the base of each trunk. Stems terete to quadrangular. Leaves: seedling leaves lanceolate becoming

ovate, 1.5–11 cm long, 0.5–3.6 cm wide, plane, opposite, apex acute to acuminate, base rounded to \pm oblique, with petioles 0.2–1 mm long; intermediate leaves ovate to broad lanceolate, 4.5–23 cm long, 1.4–6 cm wide, plane or sub-falcate, sub-opposite to alternate, apex acuminate and \pm hooked, base oblique to rounded, with petioles 0.5–1.4 cm long; adult leaves alternate, linear to narrow lanceolate, 14–24 cm long, 1.6–3.4 cm wide, with conspicuous oil dots, conspicuously glossy and dark green, \pm falcate, margins entire, apex acuminate and often hooked, base attenuate, acute or oblique, petiole terete to flattened, channelled, 1.2–3.4 cm long; venation 40–65 degrees to midrib, intramarginal vein 0.8–3 mm from the margin, midrib channelled above. Inflorescence of axillary umbellasters. Flowers 7 per axil; peduncle flattened, 5–13 mm long, 3–5 mm wide; pedicel indistinct to absent in bud and flower, sometimes expressed in fruit, 0–2 mm long; buds clavate to obloid, 9–13 mm long, 2.5–5.2 mm wide; calyptra peaked-hemispherical, acutely obconical to rostrate, 4–6 mm long, 2.8–5.2 mm wide; hypanthium obloid, 2–7 mm long, 2.5–5 mm wide; ovules in 4 rows; style terete, 2.5–3.5 mm long; stamens erect in bud, filament 2.5–4.4 mm long, anthers dorsifixed, parallel, dehiscence longitudinal, 0.3–0.5 mm long, white, connective oil gland orbicular and abaxial. Fruit remaining green for many seasons, hemispherical to cylindrical, 0.6–0.8 cm long, 0.6–0.8 cm wide, 2–4-ribbed, often splitting on one side; disc level, 1–1.5 mm wide, scar distinct; valves 3, exerted. Seeds smooth, red-brown to yellow-brown or black, cuboid, strongly angular, rounded terminal hilum on flat polygonal surface, 0.8–1.6 mm long, 0.5–1 mm wide. Cotyledons bilobed. (Fig. 1).

Selected specimens: New South Wales: Northern Tablelands: Bald Rock Mountain, alt. 900 m, *Hunter* 3562, 1 Oct 1995 (NE); Warrabah west of Kingstown, *Hunter* 3564, 3566, 1 Sep 1995 (NE); Warrabah west of Kingstown, *Hunter* 3720–3723, *V. Hunter & Vollmer*, 9 Sep 1995 (NE); Warrabah west of Kingstown, *Hunter* 3724–3730, *Bruhl & Nano*, 18 Sep 1995 (NE). North Western Slopes: Warrabah National Park, west of Bendemeer, *Williams s.n.*, 18 July 1982 (NE); Moore Creek Gap near Moonbi, *Hunter* 2594, 19 Dec 1994 (NE); Upper Moore Creek, c. 20 km N of Tamworth, *Williams s.n.*, 12 Sep 1985 (NE); Moonbi Range, near Watsons Creek, *Roberts s.n.*, 22 Feb 1979 (NE); Upper Moore Creek, c. 24 km north of Tamworth, *Williams s.n.*, 20 Sep 1974 (NE); Upper Moore Creek, c. 20 km north of Tamworth, *Williams s.n.*, *L.A.S. Johnson & K.D. Hill*, 12 Sep 1985 (NE); Upper Moore Creek, c. 22 km north of Tamworth, *Williams s.n.*, 20 Sep 1974 (NE); 500 m upstream along Moore Ck from Lynchwood Scout Camp, *Hill 1289 & Johnson*, 11 Sep 1989 (NSW).

Distribution: extensive stands of *Eucalyptus quinniorum* were found along two ridges in the Nandewar Ranges on private property near Bald Rock Mountain, along the nearby Kingstown to Warrabah road. Almost mono-dominant stands were seen on deeper soil with scattered occurrences on rocky granitic outcrops. Small populations have also been seen within Warrabah National Park along the Namoi River, on adamellite outcrops in the Moonbi Ranges at Moore Creek Gap, in the Flaggy Range near Bendemeer and at Balala Mountain south west of Uralla. The species was found to be rather common around granite outcrops within the Ironbark Nature Reserve and within surrounding private properties. Surveys of similar habitat in the Moonbi, Flaggy and Nandewar Ranges over 18 days resulting in the placement of 86 quadrats, failed to find further populations of this species.

Habitat: *Eucalyptus quinniorum* can be found in open situations on exposed leucoadamellite and adamellite outcrops, in low woodland and itself forming stands of mallee woodland, between 800 and 1010 m altitude. Associated species noted are: *Eucalyptus dealbata*, *E. prava*, *E. macrorhyncha*, *E. caleyi*, *Angophora floribunda*, *Callitris endlicheri*, *Acacia neriifolia*, *A. venulosa*, *Leucopogon muticus*, *L. melaleucoides*, *Persoonia cornifolia*, *Hibbertia obtusifolia*, *H. linearis* and *Homoranthus bornhardtensis*.

Notes: the mallee habit of *E. quinniorum* is common in most instances, both on outcrops and as extensive stands on deeper soils, more rarely the species has a single-trunk habit. *Eucalyptus quinniorum* is morphologically similar to *E. oresbia* and both

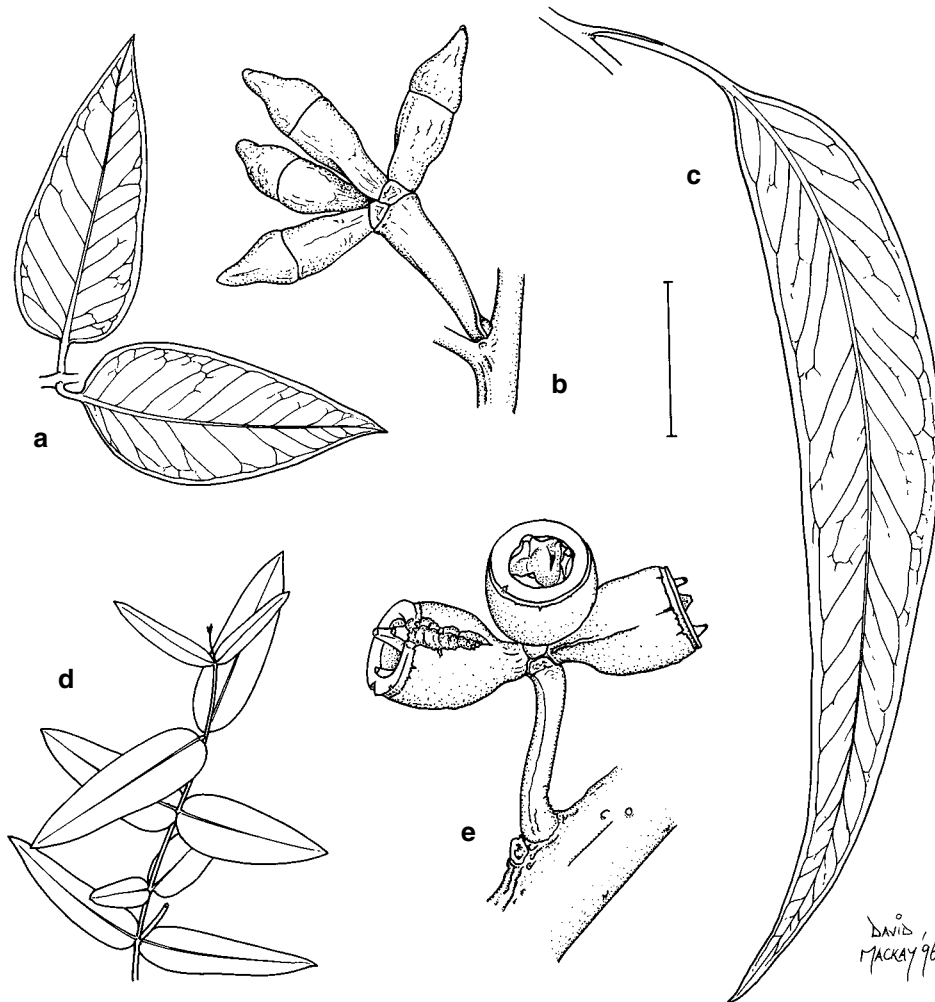


Fig. 1. *Eucalyptus quinniorum* J.T. Hunter & J.J. Bruhl. **a**, intermediate leaf; **b**, buds; **c**, adult leaf; **d**, juvenile leaves; **e**, fruit (**a** from JTH 3724; **b**, **c** & **e** from JTH 3720; **d**, from JTH 3725). Scale bar: **a**, **c** & **d** = 3 cm; **b** & **e** = 1 cm.

represent species with affinities to *E. cypellocarpa* (Table 1). For some time the populations found at Upper Moore Creek north of Tamworth and at Warrabah National Park have been determined as *E. cypellocarpa*.

Conservation status: due to the restricted and disjunct occurrence of *E. quinniorum* an initial ROTAP code of 2RCa according to the criteria of Briggs and Leigh (1996) is suggested.

Etymology: the specific epithet *quinniorum* is in honour of Chris Quinn of the School of Biological Science, University of New South Wales and Frances Quinn of Botany, University of New England.

Table 1. Comparison of selected characters for *Eucalyptus cypellocarpa*, *E. oresbia* and *E. quinniorum*.

	<i>E. cypellocarpa</i>	<i>E. oresbia</i>	<i>E. quinniorum</i>
Plant height (m)	35–45	20–30	5–16
Habit	Single-trunked	Single-trunked	Often mallee
Buds widest point	Below suture	At suture	Above suture
Buds ribbed	Yes	No	Yes
Bud shape	Fusiform	Ovoid	Obloid
Fruit length (mm)	7–10	4.5–8	6–8
Fruit ribbed	No	No	Yes
Disc type	Descending	Level to descending	Level
Valves	Inserted	Exerted	Exerted
Valve number	4	3	3
Pediceal length (mm)	2–5	3–5	0–2
Filament length (mm)	7–12	3.5–5	2.5–4.4
Vein angle	50–65°	30–45°	40–65°
Hypanthium	Angled	Rounded	Angled
Hypanthium length (mm)	5–8	2.5–5	2–7
Juvenile leaf ratio L/W	2	2.5	2.5
Juvenile leaves	Petiolate	Sessile	Sessile
Branchlet shape	Rounded	Rectangular	Rounded
Juvenile stem	Rounded	Rectangular	Rounded

2. *Eucalyptus oresbia* J.T. Hunter & J.J. Bruhl, sp. nov.

Ab Eucalypto quinniorum habitus elato et caulibus juvenalibus quadratis differt.

Type: New South Wales: Northern Tablelands: between Nundle & Hanging Rock, J.J. Bruhl 1614a, F.C. Quinn & J.R. Hosking, 4 Sep 1996 (holo NSW; iso AD, BRI, CANB, DNA, HO, K, MEL, MO, NE, PERTH).

Eucalyptus goniocalyx F. Muell. ex Miq. var. *parviflora* Blakely & McKie, *Proc. Linn. Soc. New South Wales* 63: 66 (1938).

Lectotype: New South Wales: 2 miles [c. 3 km] from Hanging Rock, E.N. McKie s.n., 28 Oct 1930 (NSW 54055) *fide* L.A.S. Johnson, *Contr. New South Wales Natl. Herb.* 3: 114 (1962).

[*Eucalyptus cypellocarpa* auct. non. L.A.S. Johnson: Boland et al., *Forest Trees of Australia* edn 4: 446 (1984); Chippendale, *Eucalypts, Angophora* (Myrtaceae), *Flora of Australia* 19: 349 (1988); Brooker & Kleinig, *Field Guide to Eucalypts* 1: 200 (1990); Hill, *Flora of New South Wales* 2: 105 (1991) p.p.]

Tree to 30 m tall. Bark smooth white, yellow or cream, rarely grey, sock absent or rarely present on younger trees to 1 m. Juvenile stems and branchlets usually strongly quadrangular. Leaves: seedling leaves ovate to elliptic, 3–10 cm long, 1–3.5 cm wide, plane, opposite, apex acute to obtuse, base rounded or ± caudate, petiolate at first and then a few pairs sessile, concolorous; intermediate leaves ovate to lanceolate, 12–18 cm long, 3–6.5 cm wide, sub-opposite to alternate, apex acute to acuminate, ± hooked,

base rounded to \pm oblique; adult leaves lanceolate, falcate or \pm plane, 9.5–18 cm long, 1.2–2.2 cm wide, alternate, conspicuously glossy and dark green, margins entire, apex acuminate and often hooked, base attenuate, acute or oblique, petiole terete to flattened, barely channelled above, 1–2 cm long; venation 30–45° to midrib, intramarginal vein 0.5–2 mm from the margin, midrib channelled above. Inflorescence of axillary umbellasters. Flowers 6–7 per axil; peduncle 8–17 mm long, 2–5 mm wide; pedicel distinct in bud and fruit, 3–5 mm long in buds, 2–4.5 mm long in fruit; buds obloid to clavate, bulbous above and below the suture, \pm 1-ribbed, 6–9.5 mm long; calyptra peaked hemispherical, acutely obconical or \pm rostrate, 2.5–5 mm long, 2–3.5 mm wide; hypanthium 2.5–5 mm long, 2–3.5 mm wide; style terete, 3–4 mm long; stamens with filaments 3.5–5 mm long, anthers dorsifixed, parallel, dehiscence longitudinal, 0.4–0.6 mm long, white, oil gland orbicular and abaxial. Fruit cupular, \pm 1-ribbed, 4.5–8 mm long, 5–8 mm wide, often splitting on one side; disc level to descending, c. 1 mm wide; valves 3, \pm level. Seeds red-brown to black. Cotyledons bilobed. (Fig. 2).

Selected specimens: New South Wales: Northern Tablelands: Nundle, *McEwan s.n.*, Aug 1927 (NSW 154314); Hanging Rock, Nundle, *Maiden & Boorman s.n.*, June 1900 (NSW 316445); Nundle, Hanging Rock, *Boorman s.n.*, June 1904 (NSW 154312); 2 miles from Hanging Rock on Nundle Rd, *McKie s.n.*, 28 Oct 1930 (NSW 316446); Hanging Rock, *Battarbee s.n.*, 23 Feb 1954 (NSW 316447); Hanging Rock via Nundle, *Julius s.n.*, Feb 1915 (NSW 316448).

Distribution: this species is apparently restricted to a small area between Nundle and Hanging Rock on the Northern Tablelands of New South Wales. Traverses of nearby areas have failed to reveal any further populations of this species.

Habitat: *Eucalyptus oresbia* can be found on steep slopes on mudstone, basalt and a variety of other rock types. Associated species include *E. elliptica*, *E. pauciflora*, and *E. bridgesiana*.

Notes: this species shows affinities to *Eucalyptus quinniorum* in the morphology of the buds and fruit (see Table 1, Figs 1 & 2).

Conservation status: due to the restricted occurrence around Hanging Rock, an initial ROTAP code of 2E according to the criteria of Briggs and Leigh (1996) is suggested.

Etymology: meaning living on mountains, the specific epithet refers to the mountainous country in which this species is restricted. Blakely (1955) records the common name of 'Small-fruited Mountain Gum' for this taxon.

Discussion

Eucalyptus quinniorum and *E. oresbia* are as distinctive as other species within the section *Viminales* and warrant specific recognition. Both of these new taxa are closely allied with *Eucalyptus cypellocarpa*, and all share the smooth 'gum' trunk and non-glaucous lanceolate to ovate juvenile leaves.

Eucalyptus cypellocarpa (which included *E. oresbia* and *E. quinniorum*) and its allies, *E. goniocalyx*, *E. nortonii* and *E. alaticaulis* (which included *E. retinens* and *E. volcanica*) were defined by Chappill (1988) and Chappill and Ladiges (1996) as a monophyletic group. This group was characterised by the possession of a bud with the hypanthium waisted at the midpoint, a prominently sunken fruit disc, and a cylindrical fruit. Chappill and Ladiges (1996) state that the character 'hypanthium waisted at the midpoint' was the only character fully consistent with their cladogram. Additionally, two of the characters that separate *Eucalyptus goniocalyx* and *E. nortonii* from the *E. cypellocarpa* group are rough persistent bark and a ribbed hypanthium. However, the hypanthium of *E. volcanica* is waisted above the midpoint, and both *E. volcanica*

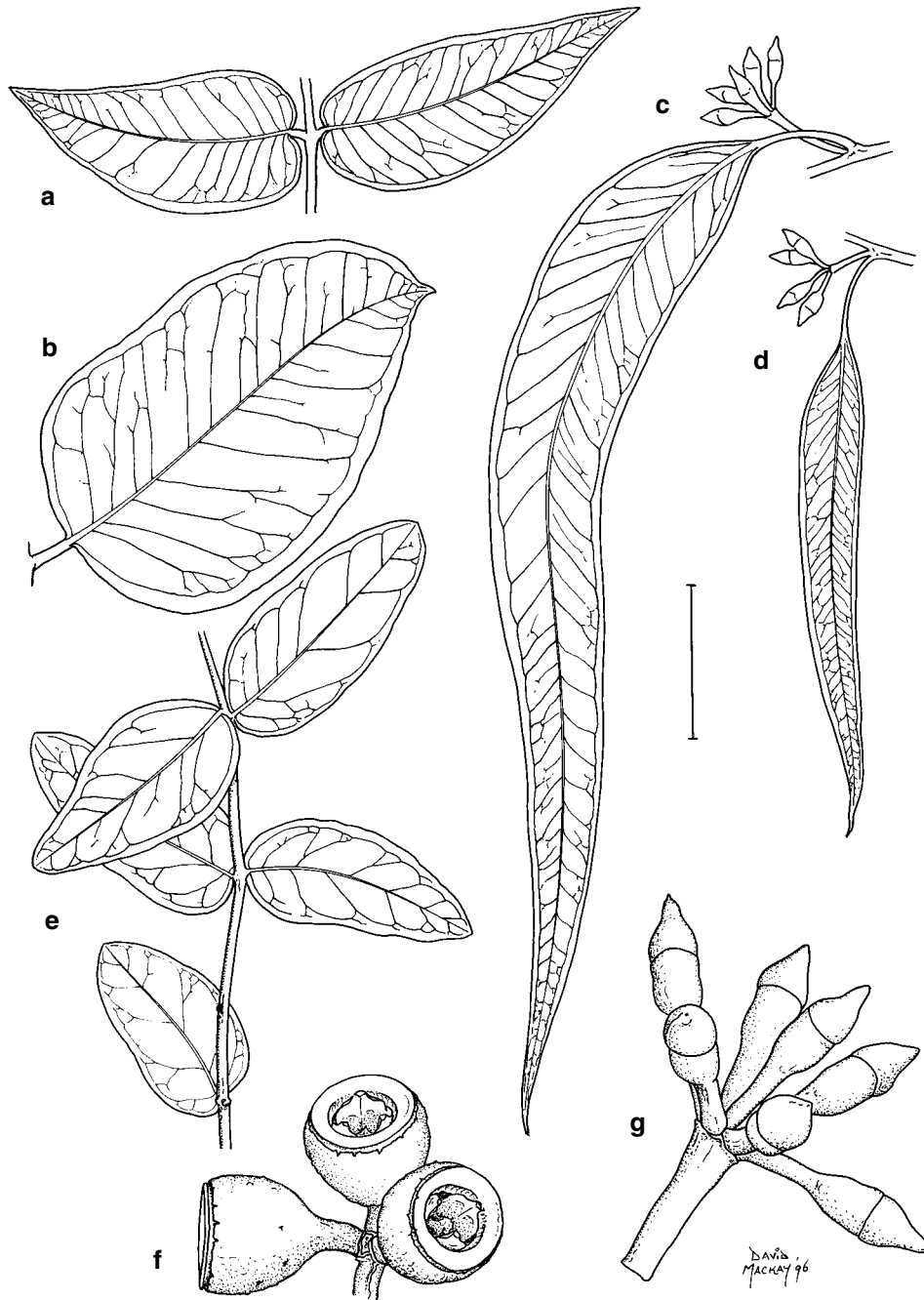


Fig. 2. *Eucalyptus oresbia* J.T. Hunter & J.J. Bruhl. **a-b**, intermediate leaves; **c-d**, adult leaves and buds; **e**, juvenile leaves; **f**, fruit; **g**, buds (a, b from JJB 1614b; c, d, f, g from JJB 1614a; e from JJB 1614c). Scale bar: a-e = 3 cm; f-g = 1 cm.

and *E. retinens* have a level disc. Both *E. volcanica* and *E. retinens* have rough persistent bark on the trunk and both have ribbed fruit, the latter prominently so. Additionally, *E. quinniorum* and *E. oresbia* both have buds and fruits not waisted at the midpoint yet have level discs and somewhat ribbed hypanthia. Whether *E. volcanica* should be placed so close to *E. goniocalyx* is therefore debatable, and the relationships of these taxa warrant further close analysis. It appears that *E. quinniorum* and *E. oresbia* are distinct species and are allied to *E. cypellocarpa*. Future cladistic analyses should include *E. retinens* and *E. volcanica* separate from *E. alaticaulis* and will now need to include *E. quinniorum* and *E. oresbia* before a concise understanding of the relationships of this group can be achieved.

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