

A new species of *Eucalyptus* from the margins of salt lakes in Western Australia

By S. G. M. and D. J. Carr¹

Abstract

Carr, S. G. M. and D. J. A new species of *Eucalyptus* from the margins of salt lakes in Western Australia. *Nuytsia* 3, 2: 173–178 (1980).

A new species (*Eucalyptus halophila*) is described. It is included in the informal series "Bisectae" but appears to have no close affinity with any other species. It is characterized by persistent spiral phyllotaxis and stomata with anterior chambers occluded by cutinised polar wall ingrowths.

Eucalyptus halophila D. J. Carr et S. G. M. Carr sp. nov.

Frutex parvus affinitatis incertae qui ab speciebus *Eucalypti* omnibus ut sequente differt: cotyledones bisectae; medulla sine glandibus oleosis; cubiculum anticum stomatale incementis intrusis cutinalibus parietis polaris ornatum; phyllotaxis semper (2, 3) spiralis; staminodia externa; valvarum apices in fructu nulla; testa brunnea, favosa, ordinatione cellularum indistincta.

Type: 12.5 km NNW of Dalyup, Western Australia, near small salt pan (131°32'E, 34°37'S), 25 February 1966 *A. S. George* and *S. G. M. Carr* 7661. (holotype: PERTH).

A small shrub of uncertain affinity which differs from all other known species in the possession of the following constellation of characters viz: bisected cotyledons; pith without oil glands; anterior stomatal chamber ornamented with cutinised polar wall ingrowths; phyllotaxis persistently (2, 3) spiral; external staminodes; tips of valves lacking in fruit; testa brown, honeycombed, cell pattern indistinct.

Description

A lignotuberous *shrub* up to 2 m tall; bark deciduous, pale-grey or brown, both it and the pith without oil glands. *Leaves* green, concolorous, held more-or-less erect, triplinerved, the lateral nerves distant from the margin, minor veins obscure; seedling and juvenile leaves narrow-linear to narrow-obovate, blunt, phyllotaxis (2, 3) spiral (Fig. 2E); intermediate (Fig. 1B) and adult leaves (Fig. 1A) (2, 3) spiral or sub-decussate (Fig. 2F), narrowly elliptical, symmetrical or slightly falcate. *Unit inflorescences* axillary (3–) 7-flowered, the upper ones subtended by leaves, the lower by prophylls, peduncle slightly flattened with acute margins. *Flower buds* obpyriform, stalked, pedicel slender, shorter than the hypanthium. Sepaline *operculum* shed early, petaline operculum conical or rounded, much wider than long, usually with a small umbo. *Staminophore* projecting over the tube of the flower; outer filaments anantherous or with abortive anthers, not all inflexed, zig-zag before anthesis; filaments of fertile stamens very short, inflexed. *Anthers* broader than long, lobes globular, dehiscence by introrse oblique slits, filament inserted at the mid-point or below it. *Nectary* lining the tube of the flower; upper surface of ovary

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slightly domed and with small ridges indicating the mid-lines of the loculi. *Style* straight, slightly tapered, as long as the cone of stamens in bud; stigma inconspicuous, domed, as wide as the style. *Fruit* (Fig. 2C) sharply contracted into the pedicel, globular-truncate or ovate-truncate, 5–8 mm diameter, contracted at the orifice; valves truncate, projecting

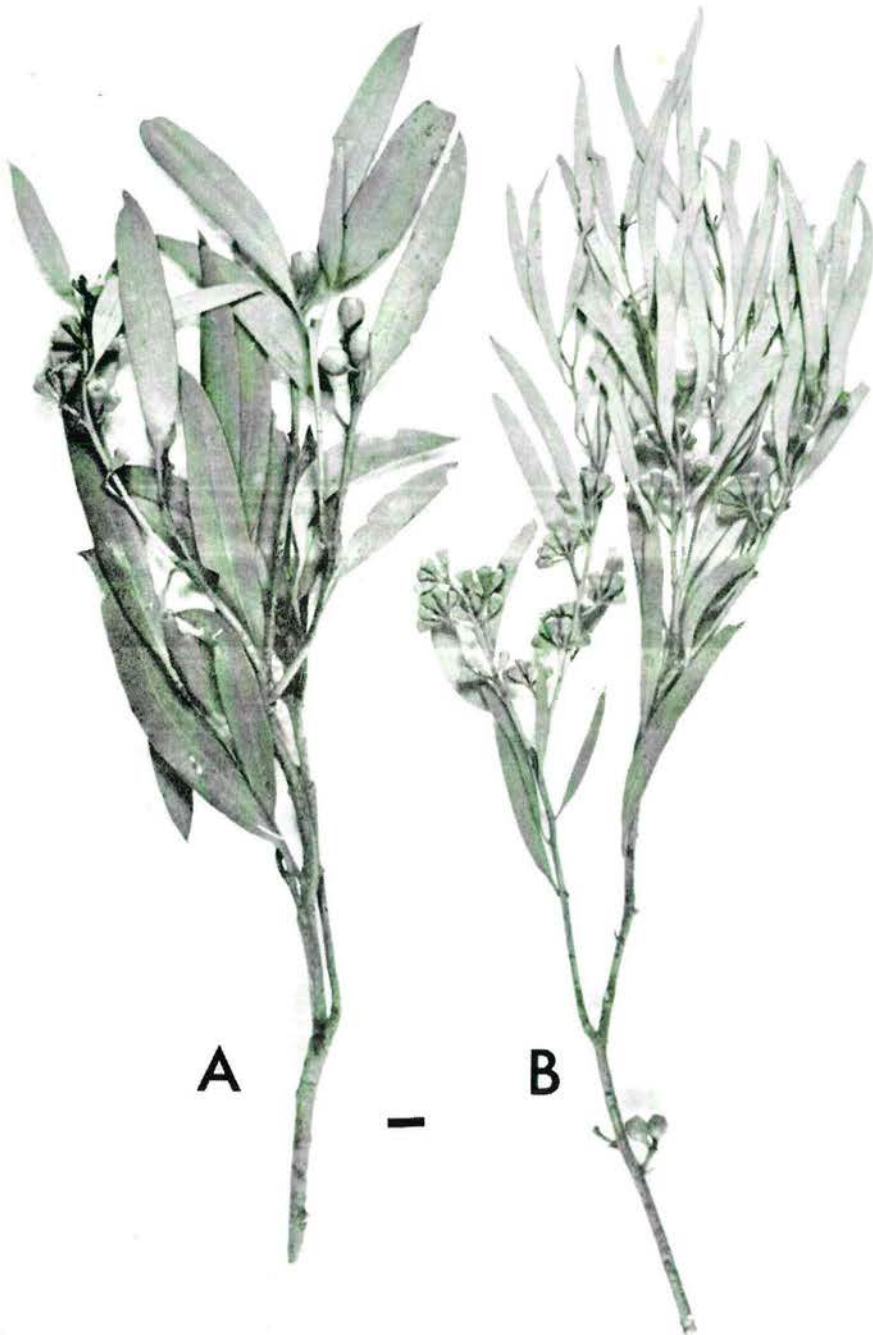


Figure 1. *Eucalyptus halophila* sp. nov. Scale marker 1 cm. A—Fragment of S. G. M. Carr 646, adult foliage. B—Fragment of A. S. George and S. G. M. Carr 7661; intermediate foliage.

only a short distance beyond the base of the nectary. *Seeds* hemitropous, testa brown, honey-combed, cell pattern not distinct (Fig. 2D) hilum more or less central. Cotyledons bisected.

Specimens examined: 12.5 km NNW of Dalyup, 25 February 1966, A. S. George and S. G. M. Carr 7660, 7662, 7663; W of Norseman-Esperance Rd, 6 km NNW of Scaddan, 1 April 1968, on sand at edge of salt lake, S. G. M. Carr 646 (PERTH).

Habitat: near the margins of salt lakes.

The species is known only from the localities cited above, both of which are in the catchment of the Dalyup River. It should be looked for in similar environments in the area. It is inconspicuous in the field and at first glance could be passed over as a species of *Acacia*. It appears to be very tolerant of wind-pruning and in Canberra has survived prolonged frosts down to -5°C without damage.

Affinities

It appears to have no close affinities with any other species in the informal group 'Bisectae' to which it belongs. The ornamentation of the anterior stomatal chamber (Fig. 3) is unique. On the other hand, *E. halophila* has features shown individually (but not in combination) by other species of 'Bisectae'. Its seeds match those of *E. salubris* F. Muell. and allied species, but *E. halophila* differs from the members of this group in so many other features that a relationship to it is unlikely. *E. angustissima* F. Muell. is a species similar in habit which has been collected at the edge of salt lakes, but it differs in having internal staminodes, inflexed filaments and the tips of the valves persisting in fruit. *E. gracilis* F. Muell., *E. calycogona* Turcz. and *E. celastroides* Turcz. have external staminodes arranged as in *E. halophila* but in those species the tips of the valves persist in fruit and the pattern of the testa is distinct and of low relief.

Notes on morphological characters

1. Fruit

The seeds mature within twelve months of flowering. Dehiscence of the fruit may follow or it may be postponed for at least a further year during which time the fruit increases in size. This means that mature fruit of two sizes (diameter 5 mm and 8 mm) may be present on the same plant (Fig. 2C). The surface of first year fruits is smooth, that of second year fruits wrinkled. Dehiscence of the capsule may involve a single process or require two stages for its completion. In the first an irregular disc of ovary tissue crowned by the base of the style is shed (Fig. 2A, B). The truncate valves then separate loculicidally. In the second case dehiscence begins at the midlines of the loculi and extends into the base of the style. Initially, each valve is then tipped by a segment of the style base. The fragility of the valves, for which no definite structural reason can be advanced, is indicated by the fact that if their tips are still present in an open fruit even a light touch with a needle detaches them.

2. Venation

The venation is extremely obscure in living material but the triplinerved pattern becomes clearer on drying.

3. Intermediate and adult foliage

Flowering and fruiting occurs on shoots with either intermediate or adult foliage. Some apparently fully-grown plants in the natural habitat appear to lack adult foliage. Other plants of the same size in the same area possess it. A specimen raised from seed and grown for 12 years in Canberra has not yet produced adult foliage although it has flowered and set fruit. However, it occasionally produces a shoot with sub-decussate leaves.

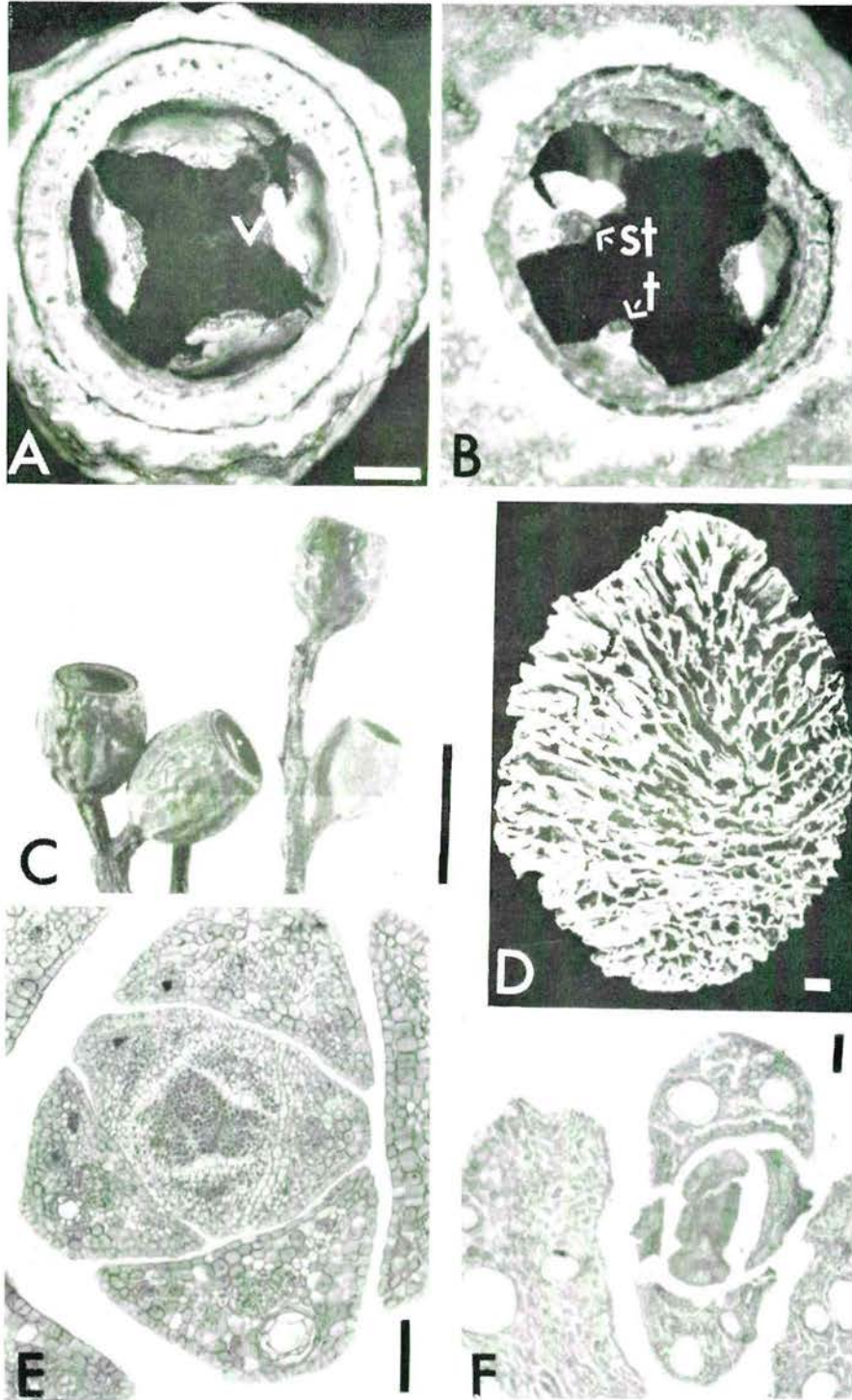


Figure 2. *Eucalyptus halophila* sp. nov. A and B, mature fruits, showing dehiscence of valves (v); st, base of style; t, tip of valve. Scale marker, 1 mm. C—two sizes of mature fruits of S. G. M. Carr 646. Scale marker, 1 cm. D—seed of A. S. George and S. G. M. Carr 7661. Scanning electron micrograph. Scale marker 0.1 mm. E and F—transverse sections of vegetative buds. E, from plant grown in Canberra with intermediate foliage and (2, 3) spiral phyllotaxis. F, from herbarium material of S. G. M. Carr 646 with adult sub-decussate foliage. Note: other buds of the same material with adult foliage are (2, 3) spiral. Scale markers, 0.1 mm.

4. Stomata

Paradermal sections (Fig. 3D) or scanning electron micrographs of the leaf surfaces (Fig. 3A) show the stomata to be occluded, leaving only a narrow H-shaped passage. Occlusion is by grooved tongues of cutinized wall material which descend into the anterior chamber from its walls above the poles of the guard cells (Fig. 3 B, C). These tongues are developed in relation to the unusual upturned poles of the guard cells (Carr and Carr, 1980) in both intermediate and adult foliage. The stomata of intermediate (Fig. 3B) and of adult leaves lack stomatal bars (Carr and Carr, 1979).

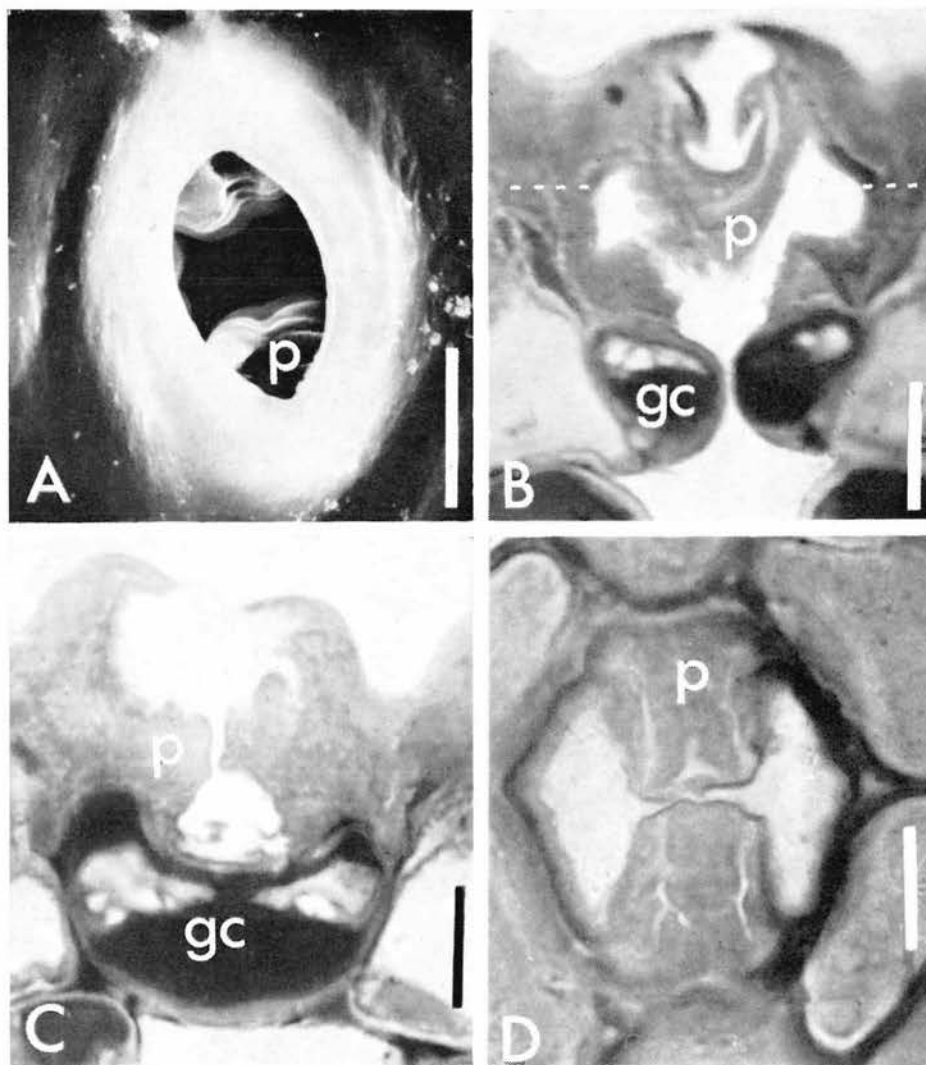


Figure 3. Stomata of *E. halophila*. Scale marker, 0.01 mm. A—scanning electron micrograph of prepared leaf cuticle from type material. P, polar flap. B and C—thin sections of leaf from plant grown in Canberra, embedded in glycol methacrylate and stained according to Carr and Carr, 1978. Gc, guard cell; p, polar wall ingrowth. B, t.s. stoma, C, l.s. stoma. D—paradermal section through a stoma at the level indicated by dotted lines in Fig. 3B.

Acknowledgements

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