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Trees of Western Australia— lemon-flowered gum

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TREES OF WESTERN AUSTRALIA

By C. A. GARDNER, Government Botanist

No. 13—THE CORAL-FLOWERED GUM (*Eucalyptus torquata* Luehm.)

AMONG the more decorative small trees available for planting in the Eastern Agricultural Areas, there are few more suitable than *Eucalyptus torquata*. This tree, known also as the "Christmas Tree" of the Coolgardie and Dundas districts, usually blooms during December, and its handsome drooping coral-pink blossoms make it a conspicuous object in the woodlands at that season of the year. It was first discovered by L. C. Webster near Coolgardie in 1901, on a stretch of stony dioritic country 25 miles in length and about a quarter of a mile in breadth. It is found at least as far south as Widgiemooltha, growing there on the stony hills, and is to be found also on Montana Hill at Coolgardie. Norseman, where it has also been recorded, is probably the southern limit of its area of distribution.

Although known as a gum tree, it is rough-barked on the trunk and lower parts of the main branches. Except when in flower it is not a particularly attractive tree, although its dark, rough bark and blue-grey foliage make a pleasing contrast when grown with smooth-barked trees. Its widely spreading branches make it a useful shade tree, but perhaps its chief value, apart from the colour of its blossoms, is its habit of blossoming when very young. Trees three or four years old and less than four feet in height may sometimes be seen in full blossom under cultivation.

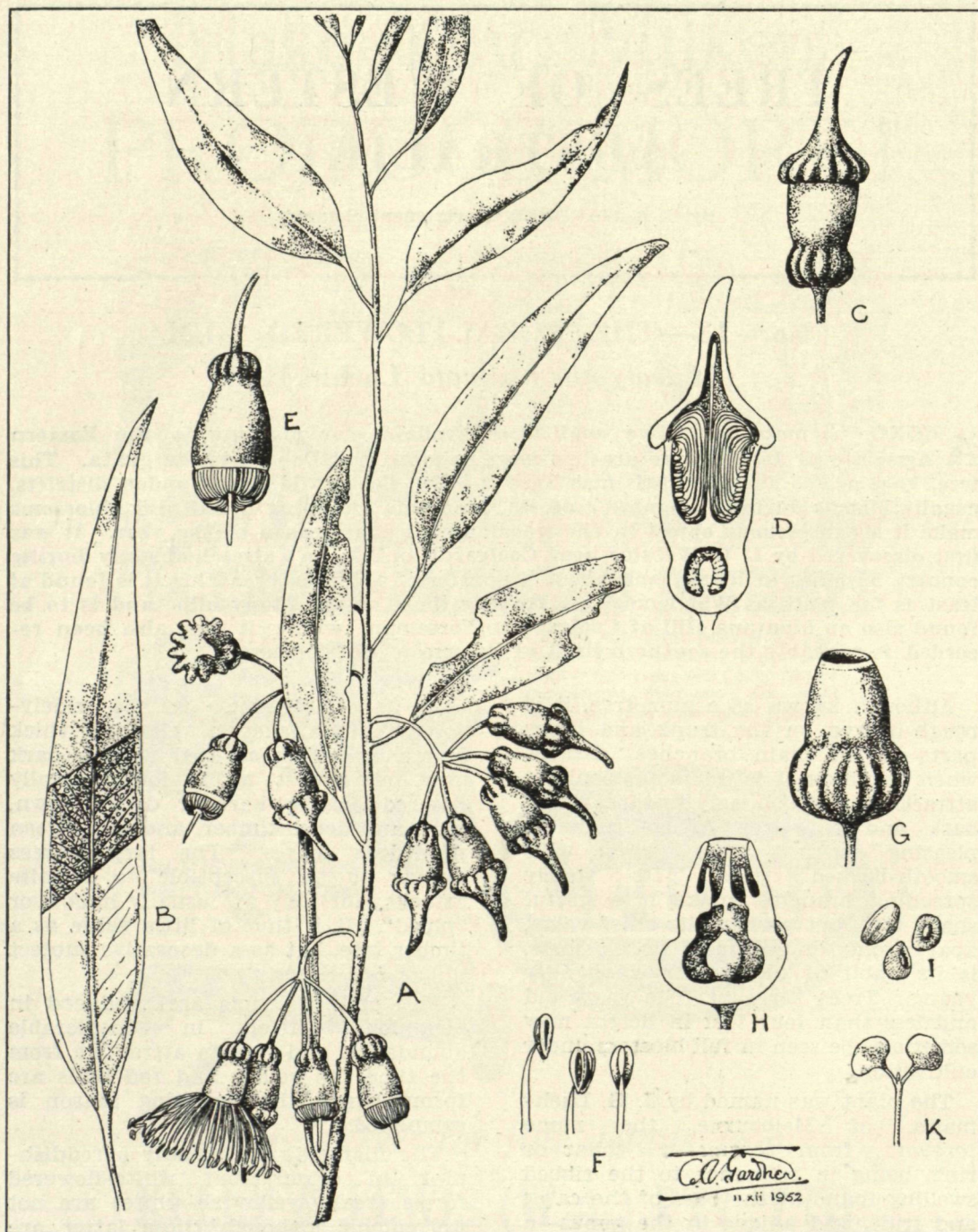
The plant was named by J. G. Luehmann, of Melbourne, the name *torquata*, from *torquis*—a collar or ring, being in reference to the ribbed swelling found at the base of the calyx and fruit, and unique in the genus—a character that is readily recognised.

The tree sometimes attains a stature of 35 feet, but usually it does not ex-

ceed 20 or 25 feet. It has widely-spreading branches, a relatively thick and short trunk covered with a dark grey, or almost black, longitudinally fissured friable bark, a dark brown, hard and dense timber, and blue-green pendulous leaves. The larger trees appear to be susceptible to termite attacks, for they are usually hollow or "piped". It is thus of little value as a timber tree, but as a decorative subject it has few rivals.

The pink blossoms are produced in pendulous clusters in considerable abundance, and remain attractive from the time the yellow and red buds are formed until the flowering season is completed.

The filaments are usually a reddish-pink in colour, but white-flowered forms (really yellowish-white) are not uncommon, although these latter are not so attractive. In this connection it is as well to mention that several *Eucalyptus* species which possess pink



CORAL-FLOWERED GUM (*Eucalyptus torquata* Luehm). A—Branchlet with buds and flowers; B—Leaf; C—Flower bud; D—Flower bud in section; E—The same with the operculum removed; F—Stamens; G—Fruit; H—Fruit in section; I—Seeds; K—Cotyledons.
All below natural size except D (twice natural size), F, and I.

Icon. origin.

or red flowers, also produce yellow or yellowish-white flowers.

The flowers produce abundant nectar, and although we have no information on the subject, it is suggested that this tree might be of considerable value to the bee-keeper, especially since it flowers profusely when still small. For this reason, it may be worth planting.

Similarly we possess no information regarding its value as a producer of oil, but from the number and density of the oil cavities in its leaves, it may well be that the species has a value in this respect.

It is, however, as a decorative species that the tree is of greatest value. An inhabitant of fairly heavy soils on stony hills, it has proved its ability to thrive both in the sandy and loamy soils of the wheat belt, as well as in the sands of the metropolitan area. Young plants are obtainable from the nursery of the Forests Department, Kalgoorlie, and transplanting is advised not later than the middle of May. The species

is probably self sterile, so that it is advisable to grow two or more trees to secure fruits and seeds, for the fruits are also attractive.

BOTANICAL DESCRIPTION

Branchlets reddish, scarcely angled. Leaves alternate, petiolate, spreading or pendulous, glaucous, firm, flat, concolorous, lanceolate, somewhat curved, the petiole rather long, the base of the leaf tapering into the petiole, the apex fine and often hooked (uncinate), the midrib conspicuous on both surfaces, the lateral nerves not prominent, diverging from the midrib at a wide angle, the intramarginal nerve removed from but parallel to the margin; oil-cavities numerous.

Flowers in umbels in the leaf-axils, the common stalk (peduncle) recurved, slender and terete, bearing 5-7 flowers on elongated slender stalks (pedicels). Calyx-tube cylindrical-urceolate, somewhat contracted at the top, smooth except for a swollen conspicuously corrugated base, yellow or pink in colour when in bud. Operculum depressed-hemispherical but abruptly tapering into a rather long beak, broader than the calyx-tube at the base and coarsely ribbed or corrugated, smooth upwards, the beak enclosing the elongated style. Stamens incurved in the bud and descending into the deep calyx-tube, all perfect, the filaments pink or yellowish-white anthers versatile obovoid-oblong in outline, opening in distinct parallel longitudinal slits.

Fruit globular with a cylindrical-ovoid limb, deeply corrugated in the globular portion, the limb smooth, rather more than half an inch long, the rim narrow, the capsule deeply included, the valves broad with fragile subulate points which do not protrude. Seeds ovoid to elliptical, radially striate. Cotyledons orbicular to orbicular-reniform.

No. 14—THE LEMON-FLOWERED GUM (*Eucalyptus Woodwardii* Maiden.)

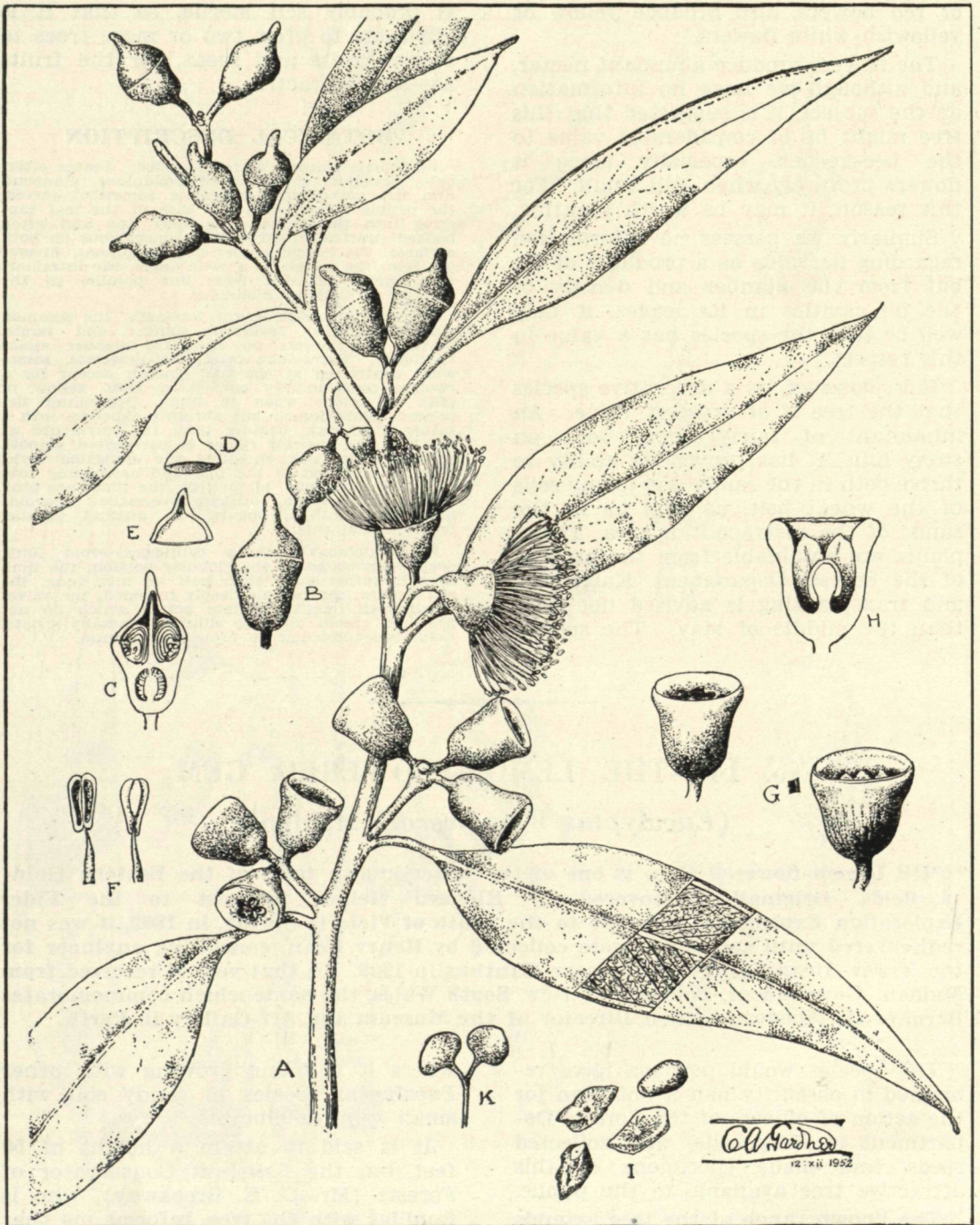
THE Lemon-flowered Gum is one of the lesser-known trees of the Eastern Gold-fields. Originally discovered by Richard Helms, botanist to the Elder Exploration Expedition, 60 miles to the south of Victoria Spring, in 1892, it was not rediscovered until specimens were collected by Henry Dean, consulting engineer for the Trans-Australian Railway, near Zanthus in 1909. In that year it received from Maiden, Government Botanist of New South Wales, the name which commemorates Bernard H. Woodward, then Director of the Museum and Art Gallery in Perth.

The species would perhaps have remained in obscurity had it not been for the action of officers of the Forests Department in Kalgoorlie, who collected seeds, and made specimens of this attractive tree available to the public.

The known range of the tree extends from about the 98 mile peg to the 120 mile peg of the Trans-Australian Railway, and some distance to the north,

where it is found growing with other *Eucalyptus* species in sandy soil with small spinifex clumps.

It is said to attain a height of 50 feet, but the Assistant Conservator of Forests (Mr. G. E. Brockway), who is familiar with the tree, informs me that he has not seen it exceeding 40 feet, although it is fairly common in its area of distribution.



LEMON-FLOWERED GUM (*Eucalyptus Woodwardii* Maiden). A—Habit; B—Flower bud; C—Section of bud; D—Operculum; E.—Operculum in section; F—Anthers; G—Fruits; H—Section of fruit; I—Seeds; K—Cotyledons.

In the field it is a somewhat untidy tree, producing masses of blossoms and little foliage, with straggling branches and pendulous branchlets. The trunk and branches are covered with a white or yellowish-white smooth bark, the outer layers of which shed annually in long ribbony strips, after the manner of its closest relative (*E. dumosa*). The timber is brown, hard and straight-grained, but apparently of no commercial value. Apart from its straggling habit and white bark, the principal features of the tree in the field are its paucity of foliage, rather broad, grey, thick leaves, frosty-white branchlets and buds, and its striking pale yellow blossoms.

This tree is recommended for planting in the eastern farming areas as a decorative subject. Like the Coral-flowered Gum (*E. torquata*) it flowers while in its youth, and trees of five or six feet in height carrying blossoms are not uncommon in cultivation.

The aridity of its habitat suggests that it will prove one of the most hardy of *Eucalyptus* trees in cultivation, but on account of its heavy blossoming and weak branches, it may be somewhat untidy in appearance. This disadvantage is, however, more than compensated for by its extreme fecundity.

Its chief advantage lies in the abundance of its clear lemon-yellow

flowers which contrast charmingly with its frosted buds and branchlets.

The tree appears to be self sterile. A tree in the King's Park in Perth, now several years old, flowers freely each summer, but has not yet produced a perfect fruit or seeds. Recently, specimens of a hybrid have been received from Kalgoorlie, the parents being *E. Woodwardii* and *E. torquata*. I have not seen the tree, but the flowers and buds assume a form intermediate between those of its parents, and the filaments are almost orange or pink in colour. It shows promise of being a powerful rival, in decorative value, to its parents.

BOTANICAL DESCRIPTION

Tree 40, rarely 50 feet tall, with a smooth white bark, the branches spreading, the branchlets sometimes pendulous, powdery-white. Leaves alternate, petiolate, spreading, the petiole thick and rigid, the leaf-blade ovate to ovate-lanceolate or rarely lanceolate, glaucous, unequal-sided at the base and abruptly contracted into the petiole, the apex abruptly narrowed and acute, the midrib thick and prominent, the lateral nerves diverging from the midrib at a wide angle, not numerous, the intramarginal nerve distinct from the thick margin.

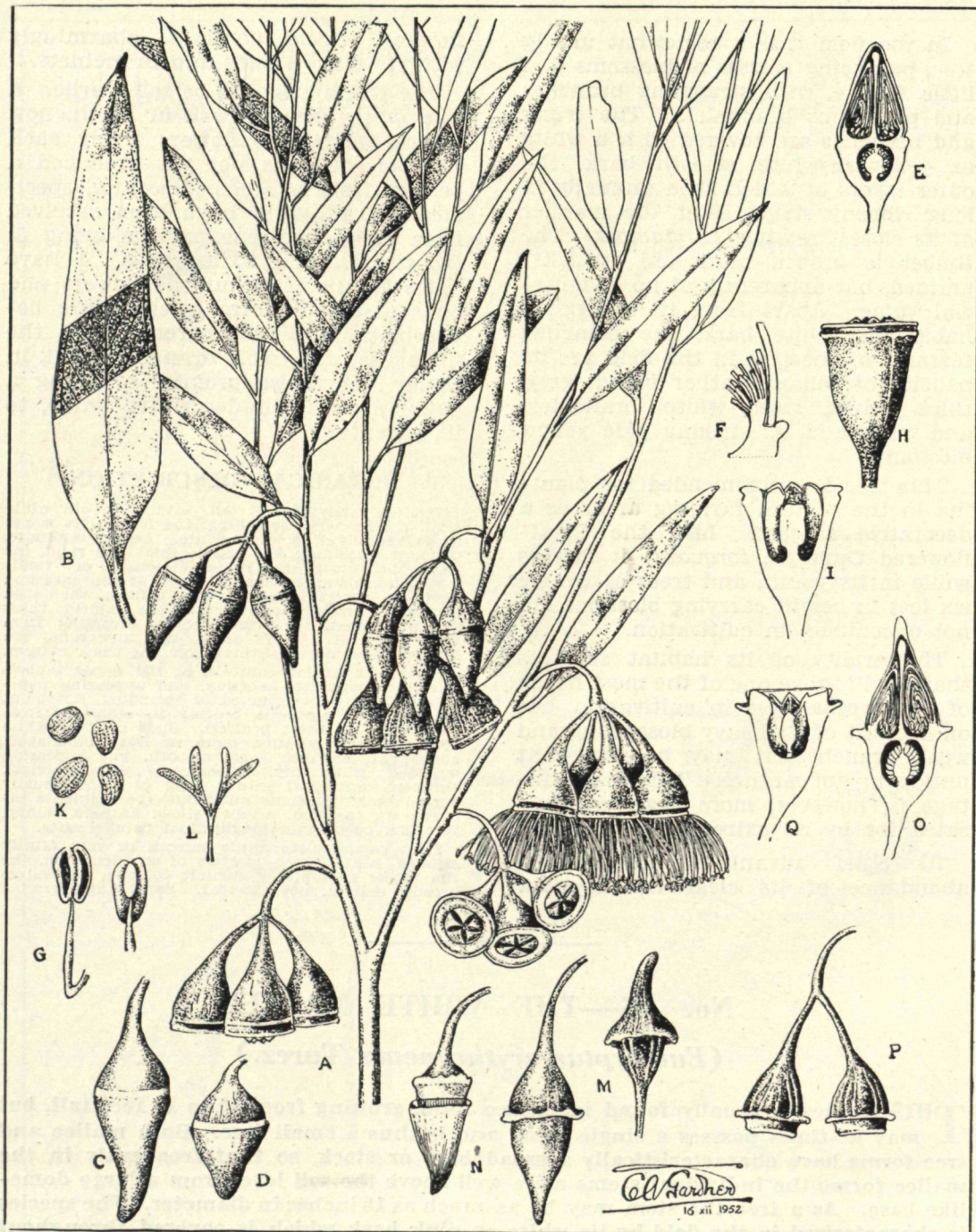
Flowers in axillary umbels, or the upper umbels lateral through leaf-abortion, and appearing paniculate. Peduncles recurved or spreading, not stout but thickened upwards, bearing an umbel of from 3-6 flowers on short pedicels. Buds powdery-white (pruinose). Calyx-tube more or less bell-shaped, about half an inch long, smooth, but appearing wrinkled when dry. Operculum hemispherical, abruptly contracted into a long or short usually curved beak. Stamens numerous, the filaments incurved in the bud, bright yellow; anthers oblong, versatile, opening in longitudinal parallel slits.

Fruit campanulate, quite smooth or very faintly striated, nearly three-quarters of an inch long, the rim rather narrow, the summit concave, the valves broadly deltoid, not exserted. Seeds angular.

No. 15—THE WHITE MALLEE

(*Eucalyptus erythronema* Turcz.)

THIS species is usually found in mallee form, growing from 10 to 18 feet tall, but may at times possess a single stem, and is thus a small tree. Both mallee and tree forms have characteristically a broad base or stock, so that frequently in the mallee forms the individual stems arise well above the soil level from a large dome-like base. As a tree the stem may be as much as 18 inches in diameter. The species is characterised in the field by its white or pink bark which is covered throughout externally with a white smooth talc-like powder. The inner bark is pale green in colour, and when the outer layers fall (decorticate) in thin plates, patches of purplish old bark, white or pink bark and new pale green bark make the tree very striking and handsome. The bark is thin, but does not strip very readily.



WHITE MALLEE (*Eucalyptus erythronema* Turcz.). (Figs. A-L) A—Branchlets with leaves, buds, flowers and fruits; B—Leaf (portion of surface removed to show nervation); C and D—Flower buds; E—Section of flower bud; F—Section through bud showing staminal ring in relation to the side of the operculum and the calycine rim; G—Anthers; H—Fruit; I—Fruit in section; K—Seeds; L—Cotyledons.
Var marginata Benth. (Figs. M-Q) M—Bud showing operculum extending over calycine rim (an unusual form); N—Flower buds (that to the left shows a falling operculum to exhibit the staminal ring); O—Section of flower bud; P—Fruits; Q—Section of fruit.

Icon. origin.

The species was named by the Russian botanist Turczaninow in 1852, the name *erythronema* being derived from two Greek words: *erythros*—red, and *nema*—a thread, in allusion to the blood-red filaments common in the species, although occasionally pale yellow-flowered forms occur. No other *Eucalyptus* has such an intense red in its blossoms.

The White Mallee has an extensive range, but never seems to be common or widespread in its area of distribution. Its western boundary extends from about Wongan Hills southward to Cunderdin and Quairading, while eastwards it extends to Southern Cross. It inhabits heavy, usually grey, clay soils, and is thus frequently associated with the gimlet tree; rarely is it found in stony soils, and usually it is indicative of excellent farming land. The variety *marginata* (figs. M-Q) occurs to the north, being common around Elphin, Manmanning, and Pithara, as far north as Dalwallinu, and as far south as Goomalling. It extends eastward nearly to Beacon. It is usually smaller than the typical form of the species, and has a less developed stock. It also occurs frequently in stony soils.

The species flowers from late November until the middle of January, and has much to recommend it as an ornamental subject because of its white bark, deep green glossy leaves and deep red blossoms. These blossoms are eagerly sought by bees, either for pollen or nectar—probably both—but its value to the beekeeper is comparatively low except in a few localities, because it seldom occurs abundantly.

The bark is rich in tannin of a pale yellow colour, the tannin content being 30.4 per cent. in a sample examined. The leaves are rich in oil of good colour and quality, the oil yield being 2.5 per cent. on air-dried material (Merredin, August), of a cineole-pinene type, containing 71 per cent. cineole, with hydrocarbons largely sesquiterpenes and about 12 per cent. alcohols. Phellandrene is absent. The variety *marginata*

(Dowerin-August), gave a yield of nearly 3 per cent. (air dried) with a cineole content of 33.7 per cent., and a substance, probably a d-pinene, in quantity.

From the above it would appear that the White Mallee, quite apart from its attractions as an ornamental subject, has a definite commercial value, if occurring in abundance in a given area.

BOTANICAL DESCRIPTION

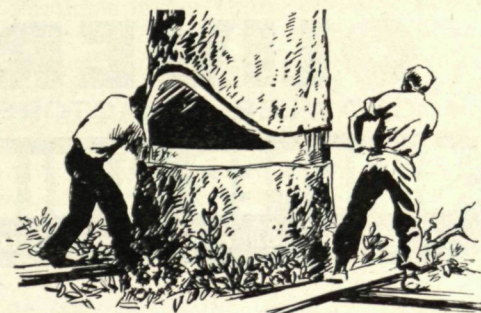
Eucalyptus erythronema Turcz.—Mallee or small tree rarely exceeding 18 feet in stature, with a few stems from a broad stock, or a tree with a dilated base to the trunk, the branches erect. Bark smooth, externally white or pink, covered with a white talc-like powder which can be rubbed off; inner bark pale green, the outer bark shedding in small thin plates. Timber pale brown, hard and dense, straight-grained, not termite-resistant and frequently "piped".

Leaves erect, alternate, petiolate, the petiole erect, usually short, the blade narrow-oblong to lanceolate, acute or obtuse, thick, lustrous, the midrib narrow but distinct, the lateral nerves either very obscure or not superficially evident, diverging from the midrib at a wide angle, not numerous, the intramarginal nerve distant from the leaf-margin. Oil cavities numerous.

Peduncles axillary or lateral, spreading or recurved, terete or nearly so, bearing an umbel of 3-5 flowers on rather long pedicels. Calyx-tube obconical (i.e., reversed conical), smooth or few-ribbed, exceeding a quarter of an inch in length and barely as broad; tapering at the base into the pedicel. Operculum broadly conical, smooth, thin, especially at the base, acute reddish in colour. Stamens all fertile, sharply inflexed in the bud, raised on an elevated staminal ring within the base of the operculum (see fig. F), the filaments deep red or yellow; anthers versatile, oblong, opening in distinct longitudinal slits.

Fruit turbinate-obconical to almost subs campanulate, about half an inch long and nearly as broad, the rim raised above the calyx-border, (i.e., the staminal rim) and usually separated from the lower calycine rim by a narrow constriction, the disc flat or slightly concave, the capsule level with the disc, the valves broadly deltoid, not or scarcely protruding. Seeds ellipsoidal, minutely striate, not winged. Cotyledons Y-shaped.

Var. *marginata* Benth. Calycine rim expanded into a prominent horizontal or reflexed ring or wing. Fig. M shows a form in which the operculum extends over the calycine rim.



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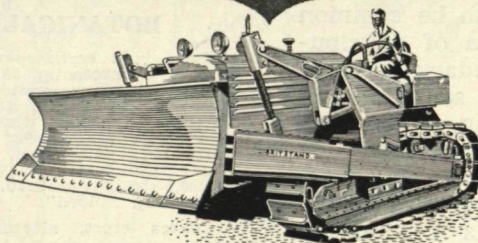
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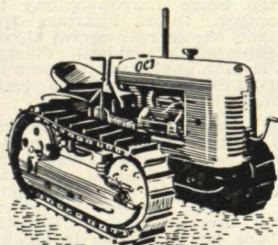
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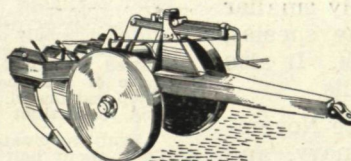
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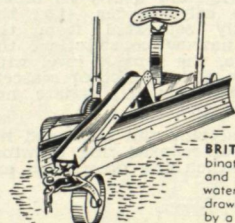
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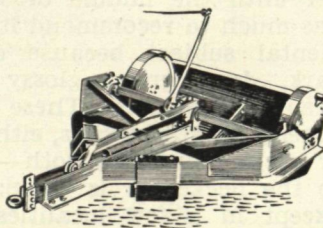


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