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DEPARTMENT OF AGRICULTURE

VICTORIA, AUSTRALIA

THE

Honey Flora of Victoria

By F. R. BEUHNE

GOVERNMENT APICULTURIST

BLOSSOM OF SUGAR GUM

(Eucalyptus cladocalyx)

By Authority:

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FOREWORD.

This publication originated in a number of articles which were published in *The Journal of Agriculture* between October, 1914, and February, 1918, to supply authentic information in plain language concerning the native flora of Victoria, particularly from the honey-producer's point of view.

It is to be looked upon as the frame-work of a structure lacking much of the material necessary for its completion, and this issue is published principally with the object of getting into touch with additional sources of information, as well as to check that so far collected and published herewith.

Much of the matter as originally published in *The Journal of Agriculture* has been extensively revised as the result of additional data obtained since, but more is still incomplete, and the author cordially invites the co-operation of those able to assist in making this bulletin as complete and correct as possible.

A considerable number of native plants of apicultural and other economic value still remain to be dealt with, as also many introduced species, some of which are of great importance. Such information will be included in a future issue.

F. R. Beuhne.

June, 1922.

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THE HONEY FLORA

OF

VICTORIA.

Three factors govern success in bee culture, namely, locality, management, and the right strain of bees. Of these three, the first named is the most important, for, without a suitable locality, the best of management and the best strain of bees cannot produce good results, while, even with poor management and an inferior strain of bees, fairly good results are sometimes obtained in good honey districts.

A good locality for bees means to have within range of the flight of the bees sufficient honey and pollen producing plants of the right kind. It is a question of quality of flora rather than quantity. For the beginner, it is by no means easy to select a locality suitable for bee-keeping, as the relative merits of the various Eucalypts and of other honey-producing plants are as yet little known, and have, so far, not been dealt with, from the apiarist's point of view, in any publication. The information available is the result of the observations of bee-keepers in different parts of Victoria made in recent years, and, as many of the Eucalypts pass under different names in different districts, and nectar production is influenced by climatic influences and other causes, absolute accuracy and completeness is not possible. Of some of the Eucalypts nothing is known as to the amount and character of honey obtained from them by the bees, but they are enumerated and illustrated to facilitate identification of others.

In the difficult attempt to describe the various species of Eucalypts in a way which will enable the reader to distinguish one from another by means of the illustrations, the technical terms which occur in the botanical works upon which the descriptions are based are, as far as possible, avoided. For the sake of brevity, and to avoid repetition, it will, however, be convenient to use at least a few of these terms. For identification, the reader is invited to rely mainly on a comparison of the shape and veins of the leaves, the shape and number in one cluster of the buds, flowers, and seed vessels, and the appearance of the sucker leaves (where shown). The illustrations are reproduced from *Forest Flora of New South Wales,* by kind permission of Mr. J. H. Maiden, Government Botanist of New South Wales, and from F. von Mueller's *Eucalypts of Australia.*

The information as to the character of the honey from different Eucalypts, the time of blossoming, length of time in bud, pollen or not pollen producing, is based upon material supplied by a number of apiarists and on the writer's own observations.

Victorian Eucalypts.

I. Box Group.

The Yellow Box-Tree (*Eucalyptus melliodora*).

Fig. 1.

The Yellow Box or honey-scented Eucalypt is undoubtedly the most valuable nectar-yielding tree of Victoria. It is a middle-sized tree, but attains exceptionally a height of 200 feet and a stem diameter of 8 feet at the base. The bark is outside brownish-grey, inside yellowish; it covers the greater part and sometimes the entire stem of the tree. There is, however, great variation in the appearance of the trunk and also the branches of individual trees. In some specimens the rough bark covers only a few feet of the stem near the ground, the rest being smooth and giving the tree at first sight the appearance of a White Gum, while other trees sometimes growing near by have the entire stem and the branches covered with rough bark, thus resembling somewhat the Black Box or the Mallee, or, when the bark is of a greyish tinge, the Peppermint. Yellow Box does not, however, grow in the same localities, Black Box being confined to drier and Peppermint to moister districts. A comparison of the three shows that the leaves of the Yellow Box are broader than those of the other two, and the veins are differently placed, particularly the marginal vein. Also in the Peppermint the number of flowers carried in one umbel is much larger.

The branches of the Yellow Box are mostly, but not always, smooth, often drooping; the branchlets are mostly very slender. The leaves are narrow, not very long, mostly of a dull-green on both sides. The small flowers are from 4 to 7 (seldom 3 or 8) in an umbel (cluster). Seen from a distance the foliage of young trees often has a decidedly bluish tinge in comparison with other Eucalypts growing near it. The wood is yellowish in colour, very tough and hard when dry. It is used for spokes, naves, cogs, rollers, sleepers, and telegraph poles.

The Yellow Box is widely distributed over Victoria, but is rarely found where the average annual rainfall is over 30 or under 15 inches, and rarely ascends to high elevations. In the western part of the State it grows usually in company with, or at no great distance from, Red Gum, Yellow Gum, and Stringybark, while in the Central, Northern, and Eastern districts it is also associated with Grey Box and Red Box. It blossoms every second year from November till February. Generally speaking, it flowers to the west of the longitude of Melbourne one year, and to the east of it the following season. There are, however, exceptions, certain areas in the western blossoming the same year as the trees in the eastern half, and, as might be expected, there is some irregularity on the imaginary dividing line.

Nothing definite is yet known as to why nearly all the Yellow Box trees in a district blossom the same year. It is suggested, however, that as blossom buds appear on new growths only, and no new wood is made by the trees in a drought year, it follows that all trees would thus be brought into the flowering stage in the same year.

The buds of the Yellow Box become visible ten to twelve months before flowering, which occurs during November, December, January,

and February. As with many other Eucalypts, there are some trees which blossom out of season.

Yellow Box honey is perhaps the best liked and best known of our Victorian honeys. When quite free from other honeys (which it seldom is), it is of a pale, straw colour, very dense, aromatic, with a pronounced flavour. It keeps liquid almost indefinitely when free from Red Gum honey. So far as is known, bees do not collect pollen from Yellow Box

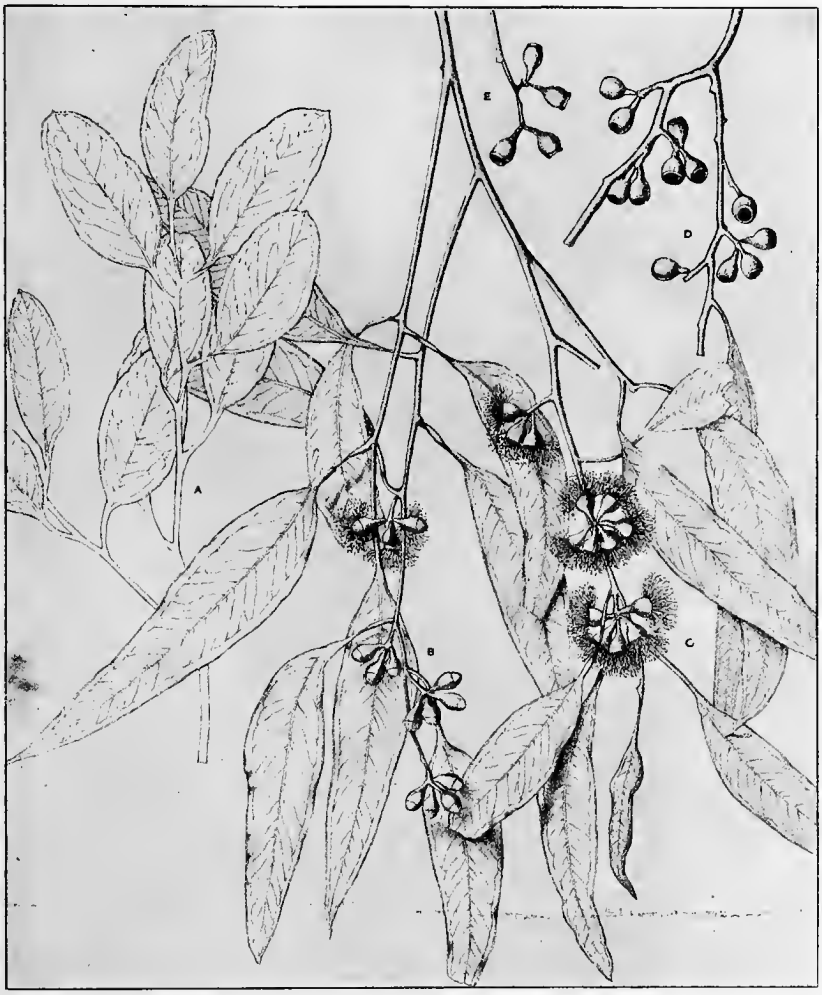


Fig. 1.—The Yellow Box (*Eucalyptus melliodora*, A. Cunn.).

blossom. Pollen which by some apiarists was credited to this source was, by means of the microscope, proved of different origin (wattle or grass tree). Where pollen-yielding plants are absent during the Yellow Box honey flow, the worker force of the colonies of bees generally diminishes owing to restricted reproduction, and queen bees raised during this period are of little value.

The Grey Box (*Eucalyptus hemiphloia*).

Fig. 2.

This tree is known in different parts of the State as Grey Box, Box, White Box, and Black Box, usually in consequence of the lighter or darker colour of the bark produced under different conditions of climate and soil.

It is as a rule not a large tree, attaining a height of 80 to 100 feet with a maximum of 140. The bark is from light to dark-grey, but slightly furrowed, and extends to the base of the branches, which are smooth or with a flaky bark, hence the botanical name, Hemiphloia (half bark). The leaves are broad lance-shaped, sometimes up to 5 or 6 inches in length, thick and rigid and greyish on both sides. The veins of the leaves are prominent, the lateral ones oblique, the marginal ones somewhat removed from the edge. The flowers are mostly in clusters of four to eight on the same season's new wood, and, therefore, projecting mostly beyond the older foliage, and making the flowering tree very conspicuous. The buds are conical, and become first visible from three to six months before flowering, which occurs from February to June, varying in different districts and in different seasons. The fruit is cylindrical and rather small.

The timber is pale, hard, durable, and highly valued for railway sleepers, telegraph poles, mining props; also extensively used as firewood. The Grey Box is widely distributed over Northern and Western Victoria, occurring within 10 miles of Melbourne, but absent in country with a rather heavy rainfall and in Gippsland, the tree known there as Grey Box being E. Bosistoana. It is usually found growing in company with Yellow Box, Red Box, Stringybark, or Long-leaf Box, and near the Mallee, Yellow Gum. To the bee-keeper it is one of the most important and useful Eucalypts, being very regular in its flowering habits, and producing more or less nectar and pollen every year. Although the individual trees blossom every second year there are some in flower every year, enabling the colonies of bees to breed up in autumn and lay in winter stores, even when no actual surplus honey can be obtained from hives. Bees usually gather great quantities of pollen from Grey Box, which often is the only available source at the end of the honey season.

The honey is of excellent flavour, medium density when fully ripe, amber in colour when free from other honeys, but candies rather quickly. When heating Grey Box honey to reliquify it after it has granulated or at time of extracting, care should be taken that the temperature does not rise beyond 165° Fahr., otherwise it may darken considerably, particularly when in contact with iron, or tinned containers.

Further, it should be noted that in contact with untinned iron such as occurs at the edges of the lever tops and the seams of honey tins, the tannic acid of the honey will, in a moist atmosphere, react on the iron, causing an inky blackness which when diffused throughout the contents of the tin, will considerably discolour the honey, sometimes giving it a dark-violet tinge. This discolouration will also occur when unripe Grey Box honey late in autumn is extracted from the combs in a badly tinned or rusty extractor

When the honey is heated at time of extracting and drawn into brightly tinned packages and hermetically sealed, little or no discolouration will take place, and candying will be delayed considerably.

Some years ago it was assumed by a number of bee-keepers that under certain conditions Grey Box honey, as winter stores, was detrimental to the health and vitality of bees. Experiments made at the Govern-

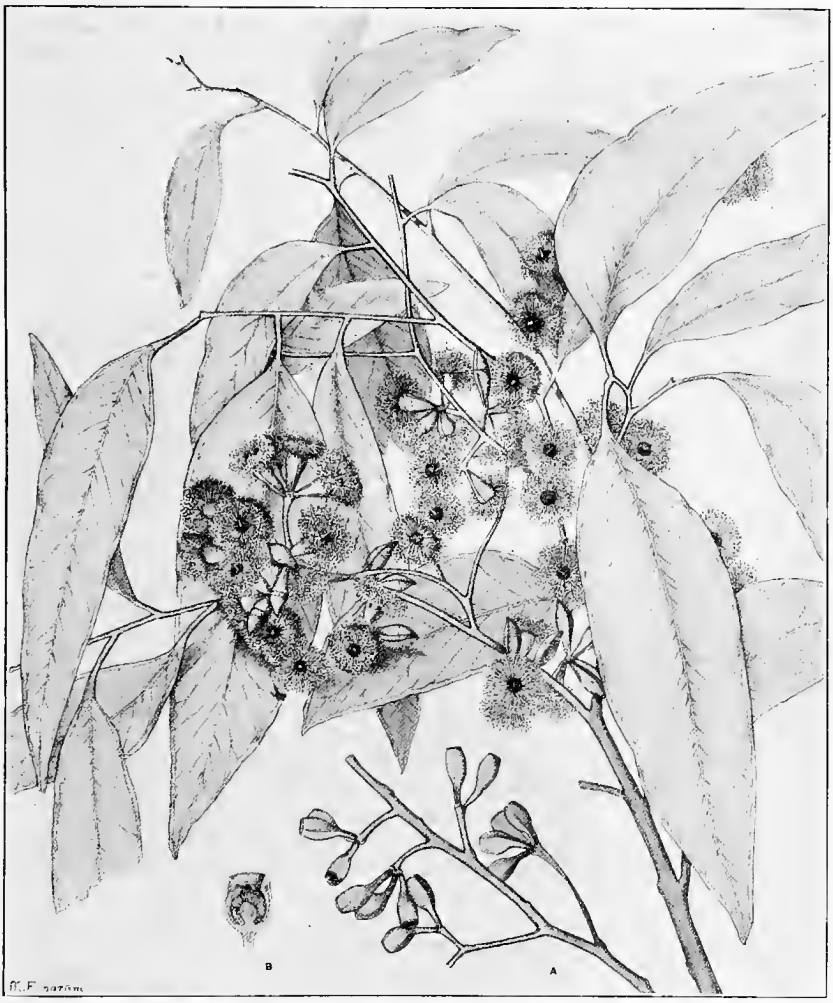


Fig. 2.—The Grey Box (*Eucalyptus hemiphloia,* F. v. M.).

ment Apiary, however, do not support that assumption, as colonies put exclusively on both sealed and unsealed combs of Grey Box honey wintered splendidly. The decline or extinction of the stocks which originated this belief was probably the result of impaired vitality of the bees caused by a shortage of pollen during the rearing of the young bees previous to the flowering of the Grey Box.

White Box (*Eucalyptus hemiphloia albens*).

This tree which in some localities is known as Blue Box owing to the distinctly bluish appearance of the foliage when seen from a distance, was at one time considered to be merely a variety of *Euc. hemiphloia*. The bark of the White Box is, however, usually somewhat whiter than that of Grey Box, the leaves, flowers, and fruits are larger, and the tree grows as a rule on higher ground. The trunk has a tendency to become hollow at a comparatively early age. It flowers earlier in the season, and is freely worked on by the bees for nectar and pollen. As it precedes the Grey Box by about a month it is very valuable to the bee-keeper in providing a pollen supply to get the colonies into good working condition for the Grey Box bloom, as there is often a dearth of pollen just before.

The Red Box (*Eucalyptus polyanthemos*).

Fig. 3.

The Red Box, in some localities called Peppermint or Peppermint Box, or Lignum Vitae, is a tree of fair size, not often very straight in the trunk. It is generally found on rather poor land, on stony or gravelly rises and ironstone ridges in districts with a comparatively small rainfall. The bark is generally dark-grey, persistent, rough and furrowed, and continues right up to the small branches. The leaves are broad, oval, or egg-shaped pointed, on rather long leaf stalks, the veins strongly marked, the marginal one removed from the edge, particularly so in the sucker leaves, the lateral veins oblique and distant. The flowers are generally on new growth, but also as laterals on the previous season's wood in umbels of 3—6 small flowers. The buds, which are roundish, appear from ten to twelve months before flowering, which occurs from September to November. It is fairly regular in flowering, some trees every year, a greater number every second year. The fruits are pear-shaped. The blossom does not yield pollen to bees in any quantities worthy of consideration. The honey is one of the palest, but rather dull in appearance, very dense, and on this account very difficult to extract from the combs. It has generally, but not always, a somewhat oily or tallowy flavour, not noticed, however, by palates used to it. When quite free from other honey it does not candy. Blended with other honeys it gives body and reduces the colour. When kept for at least twelve months the oily taste almost disappears.

The timber of this tree is hard, red in colour, the grain interlocked. It is a durable wood used to some extent for railway sleepers, mining props, and firewood.

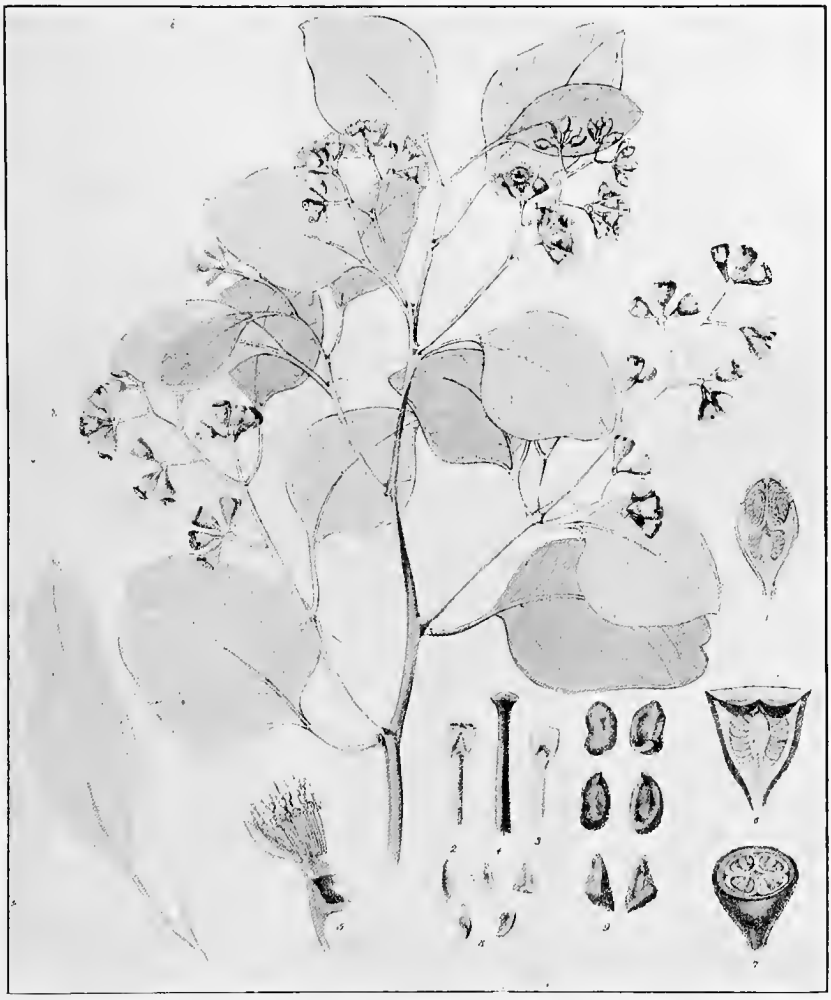


Fig. 3.—The Red Box (*Eucalyptus polyanthemos*, Schauer).

The Fuzzy Box (*Eucalyptus Baueriana*).

The Fuzzy Box, also known as Round-leaf Box, is closely allied to the Red Box (*E. polyanthemos*), of which it was formerly held to be a variety. It is found only in the eastern part of Victoria, particularly in the Lake Tyers and Tambo districts. In general appearance and habit of flowering it differs but little from Red Box, but the leaves, although round, often have a long narrow point and are wavey at the edge. Where Fuzzy Box and Red occur in the same locality the last-named occupies the higher ground, while the flower buds of Red Box are round ended, and of Fuzzy Box more pointed.

As a honey producer it is, however, quite distinct from the latter, the honey being clearer, slightly less dense, and without the somewhat objectionable oily flavour of Red Box honey. It flowers September to November.

The Long-leaf Box (*E. elæophora*. Syn. *E. Cambagei*).

Fig. 4.

This tree is found intermixed with other Eucalypts generally on poor soil and rocky hills, but also in more favorable situations in and around the Grampians, the Wimmera, Pyrenees, Upper Avoca, and the drier central part of the Dividing Range north of Melbourne, and in moister localities further east. It is known by many different names in different localities, such as Bastard Box, Apple Tree, Cabbage Gum, Grey Box, and even as Peppermint about Ararat, to which latter (*E. amygdalina*) it bears no resemblance whatever. It is a stunted tree, rarely straight, seldom up to 3 feet in diameter. The bark, which is thick, sometimes very rough but not fibrous, covers the trunk and larger branches; it is from light grey to brown in colour, fairly even sometimes, but rough, harsh, and furrowed in some localities. The wood is coarse, from light to dark-brownish grey in colour, the sap wood often very thick. As a timber it is almost useless, decays rapidly, and is even of little value as fuel.

The leaves are long, lance, and slightly sickle-shaped, of equal colour on both sides, the veins thin, moderately spreading, the marginal vein somewhat removed from the edge; the flower stalks are broadly compressed, the buds markedly angular, with a conical pointed lid, are in single clusters of from four to seven flowers; the fruits are half-egg shaped, lined by two to four angles, and three or four celled.

The Long-leaf Box is easily distinguished from other Eucalypts, in the company of which it is found by its angular buds and fruits normally arranged in the shape of a star with one bud in the centre. Till recently this tree was considered to be a dwarf variety of the Mountain or Grey Gum (*E. goniocalyx*) (Fig. 25), which is very similar in leaf, flower, and fruit, but very distinct in general appearance. Since classification of the Long-leaf Box as a distinct species, the botanical name, *E. goniocalyx*, should now be dropped by bee-keepers in favour of *E. elæophora* (Olive Barked Box).

From a bee-keeper's point of view this is in several respects a remarkable tree. It flowers at irregular intervals of four, five, or more years, but then often two years in succession. It is probably longer in bud

(eighteen to twenty-one months) than any other Eucalypt; it is a prolific yielder of pollen for bees. It blossoms from March, often right

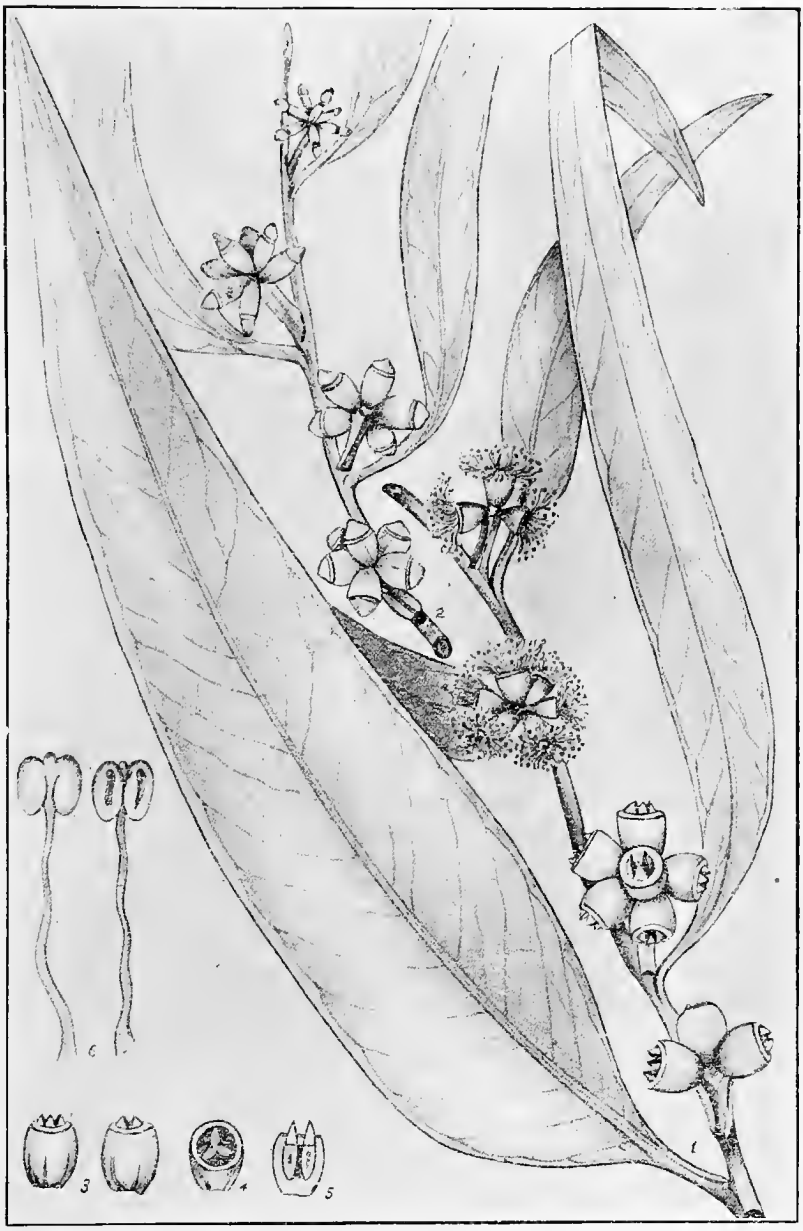


Fig. 4.—The Longleaf Box (*Eucalyptus elæophora*. Syn. *E. Cambagei*).

through the winter. The honey is medium dark, but of fair flavour, and bees invariably winter well on it; it candies coarsely, but not hard.

The Black Box (*Eucalyptus bicolor*).

Fig. 5.

This is a dry-country Eucalypt, it is found in the West and North-West of Victoria, between Swan Hill and Mildura, extending southward across the Adelaide-Melbourne railway line and to the western base of the Grampians, chiefly on the black soil of Mallee swamps. It is known by many different names, such as Swamp Box, Dwarf Box, Scrub Box, River Box, Drooping Box and Red Box, the last named on account of the reddish colour of the wood.

This tree may grow to a height of 120 feet, but in some situations little more than a large shrub. As a tree it is of a spreading and drooping habit with a general resemblance to Yellow Box. The ash-grey or blackish bark continues, however, on to the small branches. The wood is reddish, with very little sapwood, hard interlocked and very durable. It is to some extent used for fencing where straighter timber is absent.

The leaves are long narrow lance-shaped, not very thick, the veins fine, not close, the marginal vein at a distance from the edge of the leaf. The flowers are small, white, with sometimes pinkish or even crimson blossoms on the same tree, hence the botanical name "bicolor" (two-coloured). The umbels or clusters carry three to eight flowers in sprays at the end of branchlets; the buds are egg-shaped with rounded tops; the fruit is small cup-shaped, contracted at the top.

The Black Box blossoms in January and February, lasting about six weeks. Like Yellow Box, it blossoms every second year, the buds appear about eleven months before. The honey of this tree is of good quality, often very dense, but not so pale as that of yellow box; it is, however, doubtful whether it is ever obtained free from admixtures of honey from other sources. It yields pollen to bees, and is one of the best bee forage trees of the districts in which it grows.

Fig. 5.—The Black Box (*Eucalyptus bicolor*, A. Cunn.).

Gippsland Box (*Eucalyptus Bosistoana*).

Fig. 6.

A tall tree running up to over 150 feet with a stem diameter of 3 to 4 feet. The bark is rough on the trunk at the base, but smoother towards and on the branches, often giving the tree the appearance of a Gum. The leaves are mostly narrow lance-shaped, but variable in shape on the younger trees, they are generally dull green on both sides, the veins are faint, rather far apart, the marginal vein removed from the edge of the leaf. The leaves of young seedlings are roundish or egg-shaped, stalked and scattered on the stem. The umbels are few-flowered, and at the shoulders of leaves; the buds are egg-shaped, with a pointed lid. The fruit is comparatively small, nearly half-egg-shaped, with five to six, rarely four cells, and a narrow rim.

The wood is close-grained, brownish to yellowish-white in colour, and very durable; it is used for piles, railway sleepers, bridge-decking, waggon-frames, spokes, felloes, fence posts, and sawn timber.

This tree is in Victoria confined to the eastern parts, occurring chiefly in the Bairnsdale district. It is known by various local and confusing names, such as Bairnsdale Box, Box, Bastard Box, Grey Box, and Yellow Box.

Pollen is gathered from the blossoms by bees, the flowering occurring generally in February or March. Owing to its flowering concurrently with other eucalypts in the same locality, no data are yet available of the character of the honey obtained from it. It is not a very reliable source of nectar.

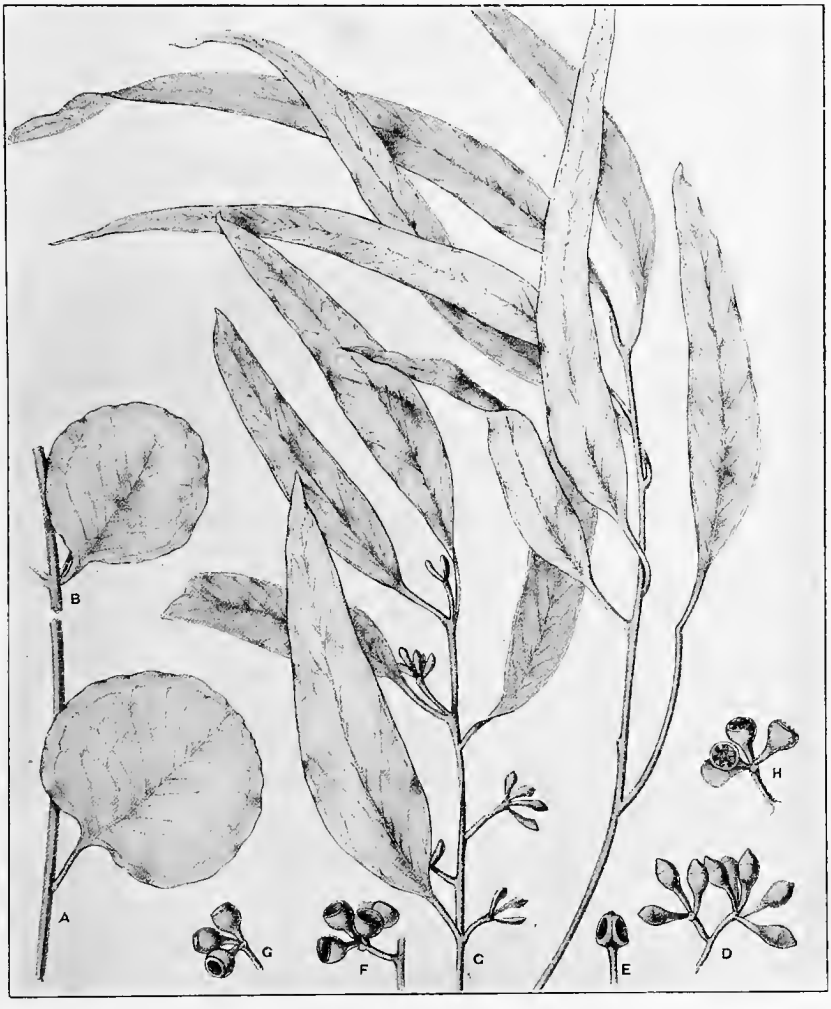


Fig. 6.—Gippsland Box (*Eucalyptus Bosistoana*, F. v. M.).

The Scented Box (*Eucalyptus odorata*).

Fig. 7.

A medium-sized or rather small tree, with greyish rough hard box bark, hence also called Box Tree. It is classed as one of the Peppermint trees on account of the scent of the leaves, which suggested the specific name "odorata." The timber is of fair quality, although seldom of large dimensions; it lasts well underground, is very tough, and used in a manner like that of Yellow Box (*E. melliodora*), of which it is an allied species; the habit of the two trees is much the same, but the Scented Box is found chiefly on limestone ridges, principally in the north-west of Victoria.

The leaves are scattered, narrow lance-shaped, rarely broad, often on comparatively short stalks, rather dull-green or somewhat shining, of equal colour on both sides; the clusters of flowers occur singly at the shoulders of leaves or in short sprays with from three to nine flowers; the buds are broad conical to pointed, half round, tapering into the short stalklet; the fruits bell-egg-shaped, three to five celled. This species although classed formerly as a Peppermint, produces a honey closely resembling that of the Fuzzy Box (*E. Baueriana*) and the Red Box. (*E. polyanthemos*), being pale and non-candying, without, however, the oily or tallowy flavour, when new, of the last-named. The Scented Box also resembles Red and Fuzzy Box in that no pollen is gathered from the blossom by bees.

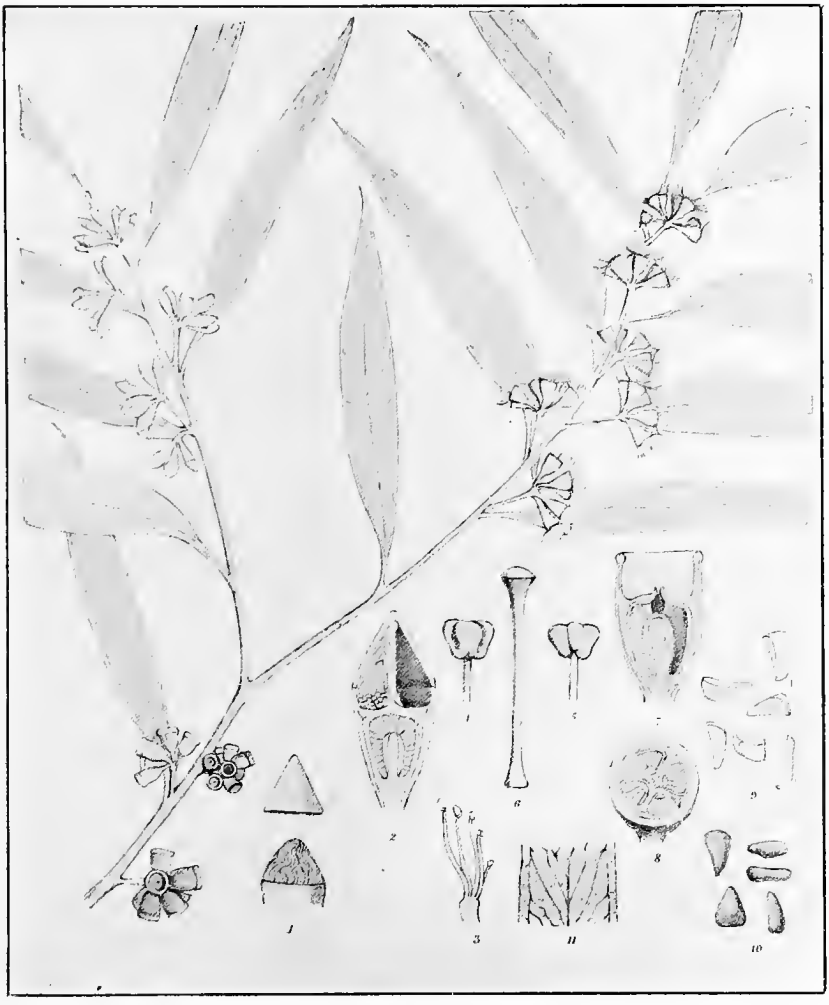


Fig. 7.—The Scented Box (*Eucalyptus odorata*, Behr).

The But-But (*Eucalyptus Bridgesiana*, R. T. Baker).

Fig. 8.

This eucalypt was formerly considered to be identical with, or a variety of, the Apple Gum (*Eucalyptus Stuartiana*). It is, however, now classed as a distinct species. It differs from *E. Stuartiana* in generally having much longer leaves, less flowers in a cluster, a whitish-grey box-like bark, instead of a red stringy bark, and a whitish-brown instead of a red-coloured timber.

It is a tree of considerable size, with a whitish-grey wrinkled, or checkered, bark, short and brittle in the grain, not fibrous, and almost identical with that of the Boxes. The bark, when freshly cut, exhales an aroma similar to the ordinary eucalyptus oil.

The sucker leaves (1, 2, 3, Fig. 8) are (in the early stage, egg heart-shaped, and then pointed egg-shaped, on stalks or stalklets opposite or alternate. The mature leaves have rather long stalks, are pointed, lance-shaped, often somewhat curved, and vary in length to over 12 inches. The leaves are not shining, the lateral veins spreading, either prominent or faint; the marginal vein well removed from the edge; the clusters on flattened stalklets carry about seven flowers; the lower half of the bud is half egg-shaped, the lid half-round, blunt or pointed. The fruit is half-round, rarely conical, on a short stalk; the rim is thickened with a ring below the edge.

The But-But flowers in January and February, in the North-East between January and April; the frequency of blossoming, however, is uncertain. The honey is of fair quality. The timber is fairly hard, and whitish-brown in colour. It is only good for indoor work, as it decays rapidly when exposed to the air or placed in the ground. The But-But is found in Victoria in Gippsland and parts of the north-east. (Description and illustration (Fig. 8) taken from Baker and Smith's Research on the Eucalypts.)

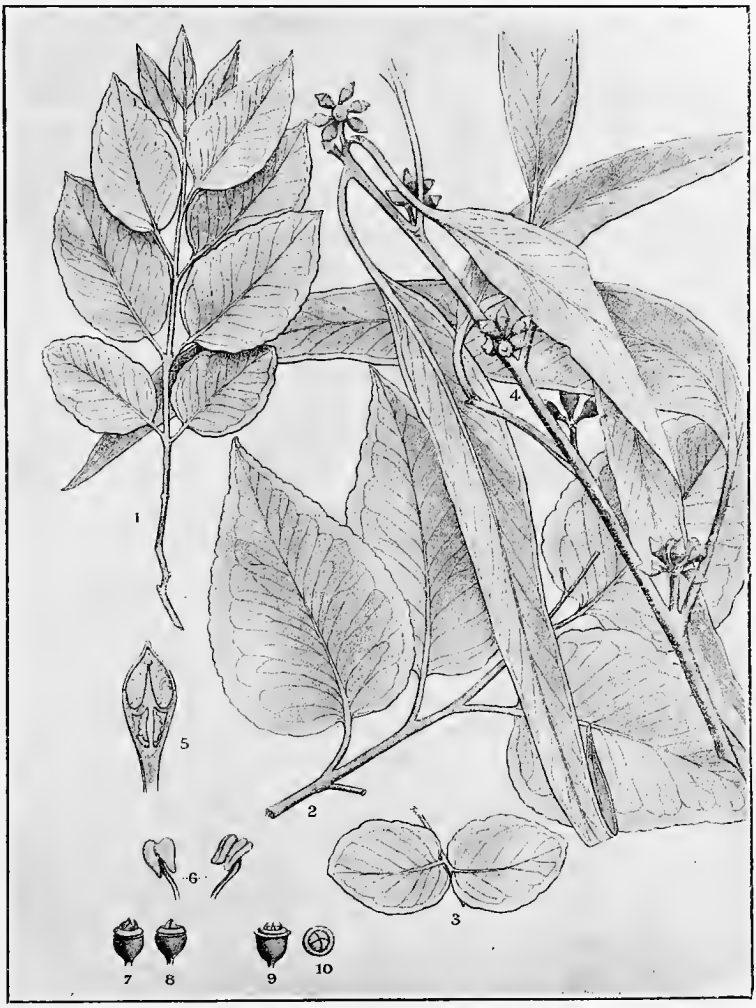


Fig. 8.—The But-But (*Eucalyptus Bridgesiana*, R. T. Baker).
[From R. T. Baker and H. G. Smith, "Research on the Eucalyptus, &c."]

The Apple Box (*Eucalyptus Stuartiana*).

Fig. 9.

A medium sized tree, with widely spreading main branches, rarely attaining to 100 feet in height. It grows on rather sandy, and often in moist, tracts of country, on low ridges, and in grass tree country. It occurs in large numbers in the scrub country of the Grampians in company with Messmate, Stringybark, and Manna Gum, is of a spreading habit, with the branchlets slender and drooping. The wrinkled brownish bark is rather scaly on the outside, but fibrous inside, somewhat resembling Stringybark, and continues, not only on the stem, but also on the main limbs. The trunk is generally twisted and gnarled rather than straight.

The leaves are scattered, lance-shaped, slightly bent, dark green on both sides; the veins are very thin and spreading, the marginal one removed from the edge; the clusters have usually more than three flowers; the buds are rounded, slightly pointed. The fruits are half-egg or top shaped, very small, oftener three than four celled.

As a somewhat smooth-barked variety of this species also occurs it is sometimes mistaken for *E. viminalis*, the Manna Gum. The differences which separate the two are given by F. von Mueller in *Eucalypts of Australia* as follows: The Apple Box (*E. Stuartiana*) is a more shady tree on account of its spreading habit, more numerous branches, and denser foliage. The leaves yield no manna, and have a more pleasant scent, reminding slightly of the odour of apples. The flowers are usually more than three in a cluster, which is the prevailing number in the case of the Manna Gum. Further, the seedling and sucker leaves of the two trees are quite distinct, as will be seen on reference to the illustrations, Figures 18 and 9.

This tree has in addition various local names, such as Apple Tree, Apple Gum, and, in the Grampians, Black Butt, on account of the blackening of the bark by periodical bush fires. It blossoms profusely from February to April, and is in bud for twelve to fifteen months. It is a very useful tree to the apiarist, as it flowers more or less every year and produces pollen as well as nectar. The honey is amber in colour, not very dense, and granulates more or less, but is very suitable winter food for bees.

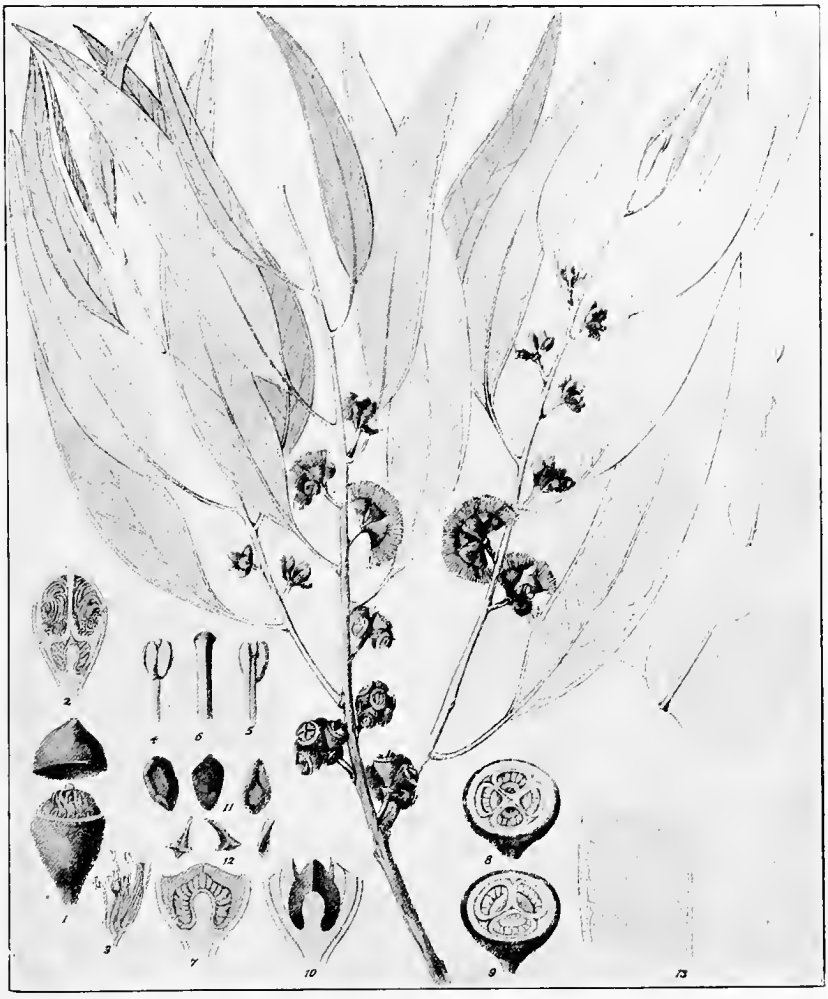


Fig. 9.—The Apple Box (*Eucalyptus Stuartiana*, F. v. M.).

II. Smooth Bark or Gum Group.

The River Red Gum (*Eucalyptus rostrata*).

Fig. 10.

This is one of the best known and most valuable of our timber trees, and so characteristic in general appearance that it is easily distinguished from other Eucalypts. It sometimes grows in company with Manna Gum, and there is some resemblance in the colour and texture of the bark of the stem of the latter to individual trees of the former, but a comparison of the two will show a difference in the shape of the buds and in their grouping.

The Red Gum grows along river banks and watercourses or in alluvial valleys. It often attains a height of over 100 feet; under particularly favorable circumstances up to 200 feet. The trunk is proportionately stout, a diameter of 14 feet being on record. The bark is smooth, ashen-grey, or whitish. The leaves are slightly sickle shaped, and of the same colour on both sides. The flowers are usually in umbels (clusters) of 4 to 14, the buds are pointed, the fruit roundish.

The wood, which is of a dark reddish-brown, is very durable, especially underground, and is extensively used for building timber, railway sleepers, and many other purposes.

The Red Gum tree blossoms every second year, usually the same year as Yellow Box, and concurrently with it, December and January being the principal months. It is in bud for eleven to twelve months. The bloom does not last long on a tree, and there is not much variation in time between different trees. The blooming period is therefore comparatively short, except on the Upper Murray, where it sometimes blossoms from November to February. The secretion of nectar is often very profuse; it is in fact one of the heaviest yielders. It also produces pollen in great quantities, and is therefore exceedingly valuable in Yellow Box country, as the pollen not only keeps the bees going in brood rearing, but also enables them to lay in a good store for a time of scarcity, which not infrequently follows.

The honey is of a clear golden colour, not quite so dense as that from Yellow Box, less aromatic, but of a milder and very good flavour; it candies quickly, and sets very hard when from trees in the Grampians country, but is less inclined to granulate when from trees on the Murray.

The Red Gum is very subject to attack from gall insects, the flower buds on nearly all the trees in a district sometimes being transformed into woody galls and enlarged to such an extent that branches break off under the weight.

The blossom appears to have particular attraction to another insect pest, the Rutherglen Fly (Bug) which infests the bloom in millions some seasons, consumes the nectar and prevents the access of bees to the blossom, by the obnoxious odour.

Fig. 10.—Red Gum (*Eucalyptus rostrata*, Schleck).

The Forest Red Gum (*Eucalyptus tereticornis*).

Fig. 11.

This, the Red Gum of East Gippsland, also passes as Flooded Gum, Grey Gum, and even Bastard Box tree. It differs from the River Red Gum chiefly in its more upright habit, the narrower and longer leaves, and the rather variable and more olbong shape of the buds occurring in individual trees. It is so closely allied to the one previously

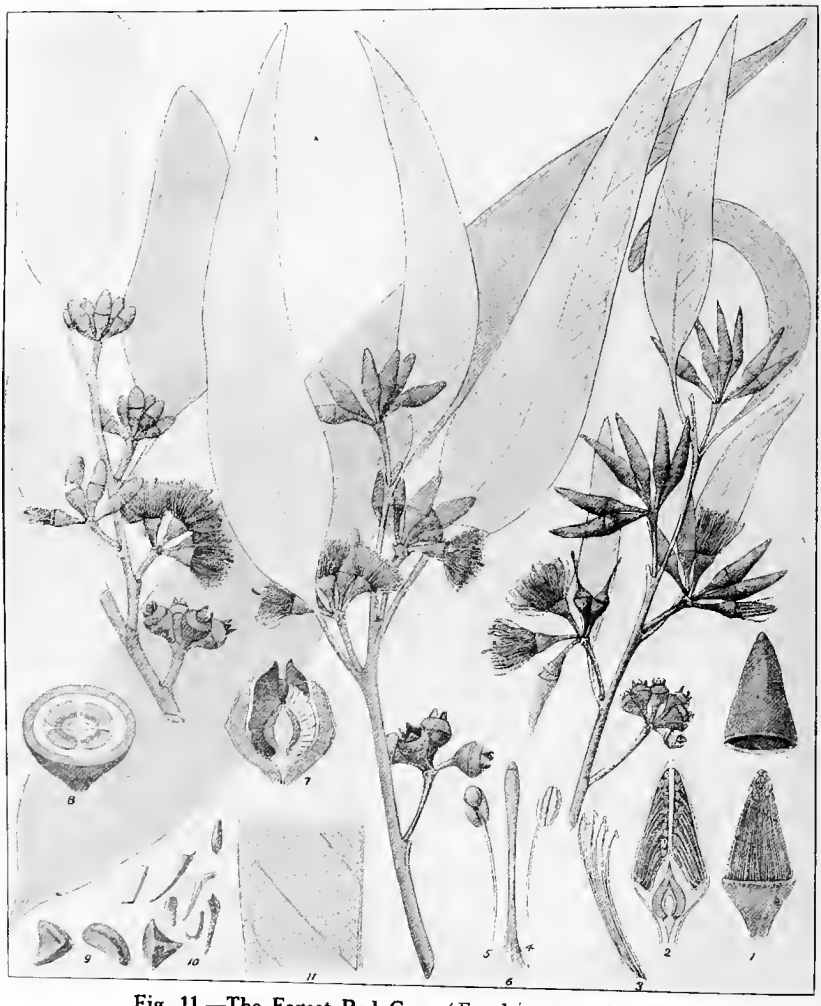
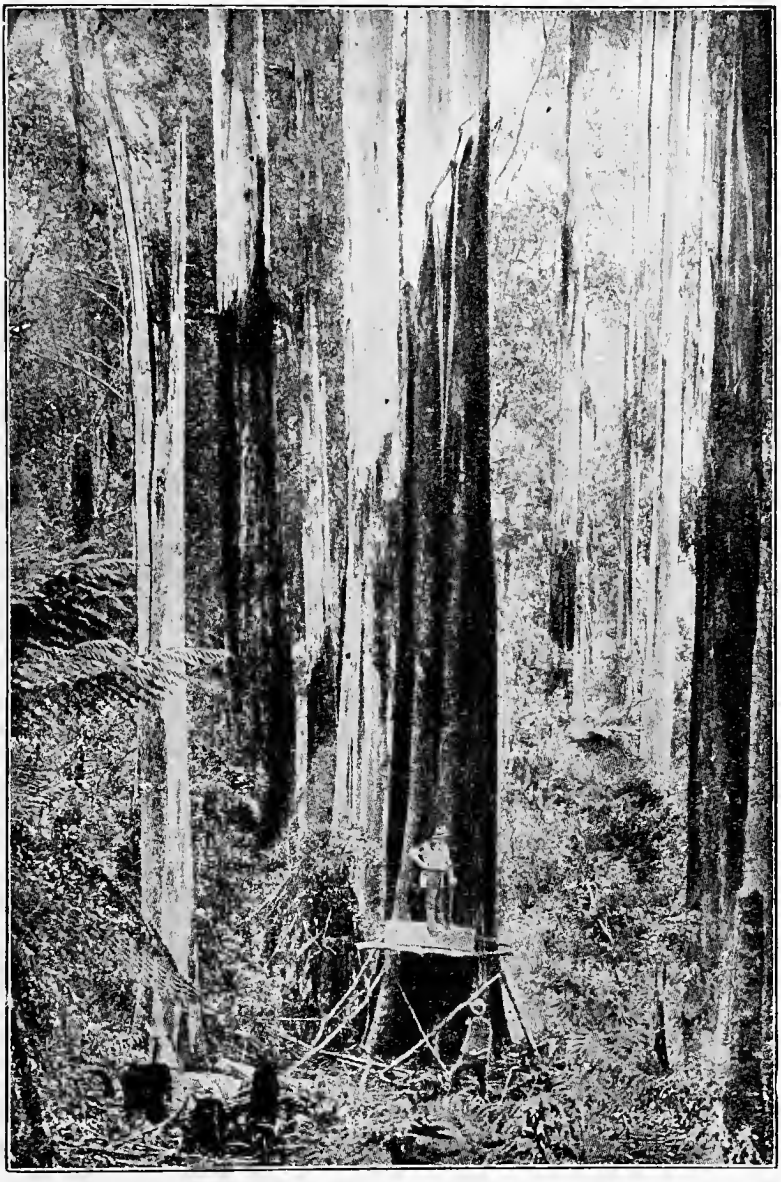


Fig. 11.—The Forest Red Gum (*Eucalyptus tereticornis*, Smith).

described that both might be regarded as forms of one species, and what has been said concerning the timber and honey value of the River Red Gum also applies here. The Forest Red Gum, however, generally grows on drier ground and is a taller and straighter tree.



Giant Forest Trees in Victoria.

Fig. 12.—White Mountain Ash (*Eucalyptus regnans*, Narbethong, Vic.)

Yellow Gum (*Eucalyptus leucoxylon*).

Fig. 13.

This tree is known by many different names, and recognised as an ironbark by few people. In South Australia and part of Victoria it is called Blue Gum, elsewhere White and Smooth Ironbark, White Gum, Gum, and White Box. The botanical name, leucoxylon, signifies "white wood." It occurs in many parts of Victoria, near the Grampians, often in company with Red Gum, Yellow Box, and Stringybark. In the Mallee it is often found near Black Box, but on drier ground elsewhere it is also associated with Red Ironbark, Grey Box, and Long-leaf Box.

Usually it is a moderate-sized tree, but attains occasionally a height of 120 feet. The bark is smooth, greyish-white, usually with a greenish-yellow tinge, more noticeable when seen from a distance. The leaves are narrow, slightly sickle shaped, greyish, or dull-green on both sides, the marginal vein distinctly removed from the edge of the leaf. The flowers, usually 3, sometimes 4 to 5, rarely 6 to 11 in a cluster, are white, pale-yellow, and rarely pink in colour; the buds are conical in shape. The flowers and fruits are sometimes considerably larger than those shown in the illustration (Fig. 13), but occasionally even smaller. The wood is pale to reddish-brown, of great hardness, durability, and strength. It is used for railway sleepers, poles, shafts, slabs, cogs, &c.

This tree is a fairly regular bloomer and heavy yielder of nectar, but no pollen is gathered from it by bees. It blossoms, generally speaking, during the winter months; near the Grampians it commences in May and June, ends in December; in drier and gold-bearing country it continues from April till November. In the Mallee it flowers in September, October, and November. The buds appear from six to ten months before. It blossoms more or less every year, but heavier every alternate season. A peculiar feature of this tree is that sometimes it secretes nectar which the bees will not collect, although honey-eating birds freely avail themselves of it. Till quite recently it was assumed that, owing to the humidity and low temperature of the atmosphere at the time of blooming, the nectar was too thin and watery to attract bees.

Some later observations proved that the same neglect occurred some seasons to the nectar of the Red Ironbark when it blossomed during dry warm weather (February), and an excess of moisture was quite unlikely. In all the instances, however, both in summer and winter, there was an entire absence of pollen, and it is just possible that the bees, unable to produce the nitrogenous secretion which converts the nectar into honey, refrained from gathering the nectar.

The honey from Yellow Gum is of the finest quality, of pale-straw colour, dense when properly ripe, clearer and milder in flavour than Yellow Box honey but candies rather quickly.

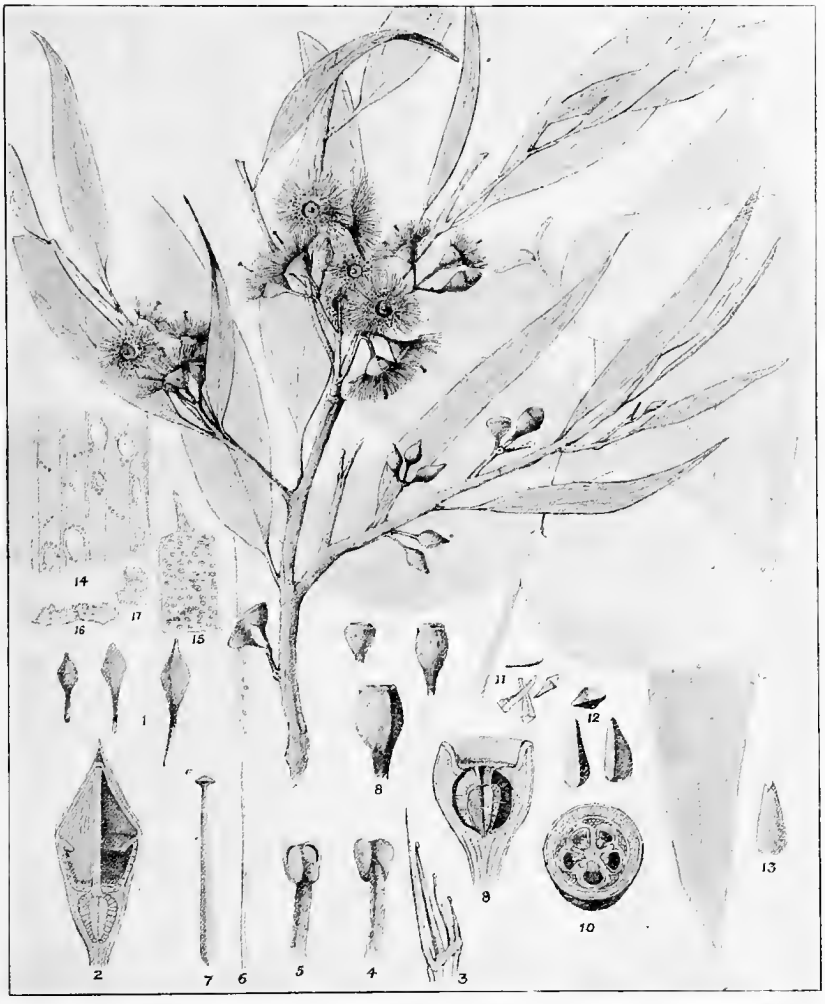


Fig. 13.—Yellow Gum or White Ironbark (*Eucalyptus leucoxylon*, F. v. M.).

THE SUGAR GUM (*Eucalyptus cladocalyx*. Syn. *E. corynocalyx*).

Fig. 14.

This tree is a native of South Australia, and the lower Wimmera, in Victoria. It reaches a height of 120 feet, the trunk attaining a final diameter of 5 or even 6 feet. The bark is smooth; the wood durable and used for fence posts, railway sleepers, and other purposes.

The leaves are scattered on the branchlets broad-lance or long-lance shaped, narrowing only very gradually towards the point; there is an oily lustre on both sides of the leaf, but the underside is somewhat paler. The veins are numerous, moderately spreading, the marginal vein removed from the edge of the leaf. The clusters of flowers are on the side of the branchlets, or at the shoulders, but frequently below the leaves on round stalks carrying from four to sixteen flowers. The buds are bell-shaped cylindric, with a blunt or slightly pointed lid; the fruit is urn-shaped, streaked lengthways, and three-celled.

The Sugar Gum is now extensively planted in parks and public gardens, being much more suitable for this purpose in dry warm localities than the Blue Gum, which under these conditions dies back after it has attained a certain age.

As a nectar-yielding tree the Sugar Gum is one of the best, its value as such has so far not been sufficiently appreciated by apiarists, because only in isolated instances is it found in sufficient numbers to produce that condition of the hives known as a honeyflow. The buds appear about thirteen months before the flowering period which occurs in January and February. It blossoms every year for a number of years and then misses one season. The blossom is very fragrant, secretes nectar freely, and lasts for a considerable time in comparison with many other eucalypts, attracting honey-eating birds, bees, and insects all day. The honey is of excellent flavour and aroma, of pale straw colour, and good density. As to pollen gathered by bees from this source the observations and opinions of apiarists differ, probably in consequence of local conditions. The information available so far indicates that bees sometimes, but not always, collect pollen from the blossom, this may be due to preference to pollen from other sources when available.

As a shade and shelter tree the Sugar Gum is one of the best, particularly for dry country. If pollarded when it becomes too tall and open it will form a dense, bushy head; when sown broadcast or planted closely it will make a good break-wind.

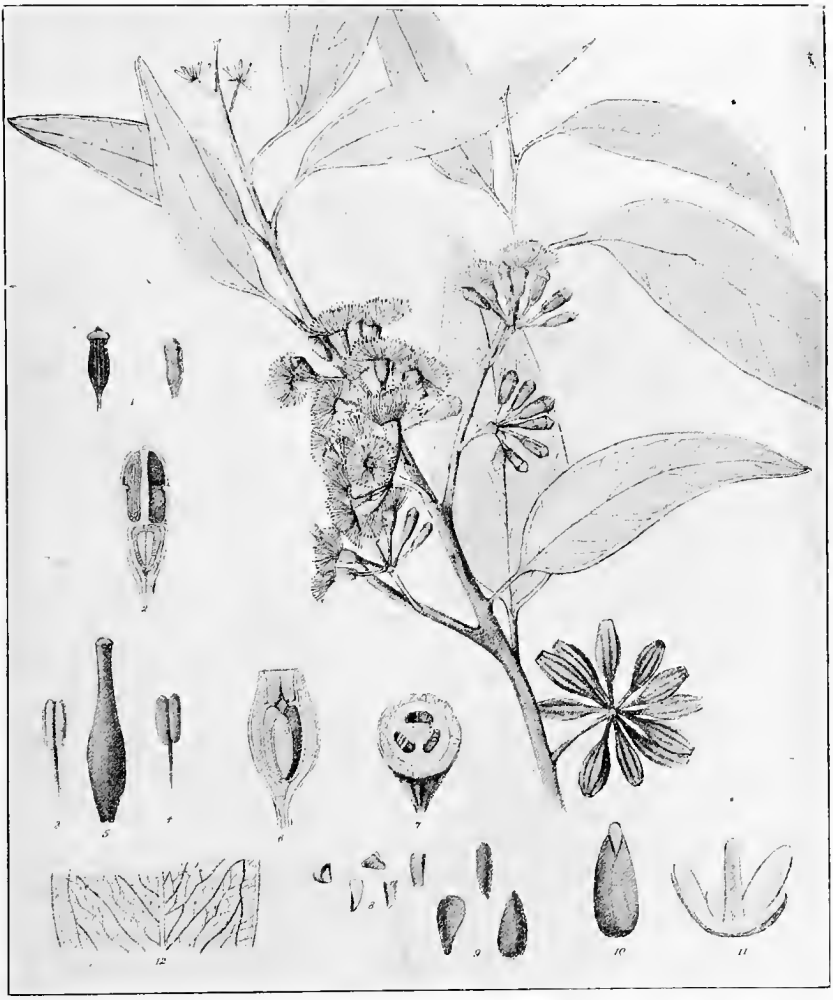


Fig. 14.—The Sugar Gum (*Eucalyptus cladocalyx.* Syn. *E. corynocalyx*).

The Blue Gum (*Eucalyptus globulus*).

Fig. 15.

The Blue Gum is one of the best-known eucalypts, extensively planted not alone in Australia, but also in America, North and South Africa, India, and Southern Europe. In a natural state it is found in valleys as well as on ridges and mountain slopes, chiefly in humid regions of the southern and eastern portions of Victoria, from the vicinity of Cape Otway to Wilson's Promontory, northward to the Murray and Tumut Rivers in the southern part of New South Wales, on the islands in Bass Straits, and in many other places, but particularly the southern parts of Tasmania.

The Blue Gum is a tall tree of upright growth attaining under favorable conditions a height of over 200 feet and a stem diameter of 10 feet. The timber is of a rather pale colour, hard, heavy, strong, and durable; it is more twisted than that of Messmate and Peppermint, but not so interlocked as that of Red Gum and of Yellow and other box trees. In house building, it is one of the best timbers for joists, studs, rafters, &c. It is very extensively used by carriage-builders and manufacturers of implements, as well as for telegraph poles, jetty and bridge work.

The leaves are scattered on the robust four-edged branchlets, lance or lance-sickle shaped, thick, and of equal colour and somewhat shining on both sides; the veins of the leaves are moderately spreading and slightly prominent, the marginal vein removed from the edge. The flower buds, which are warty, tinged with a bluish white bloom; they appear generally singly, less frequently two or three together at the shoulders of leaves. The lid of the bud is depressed hemispherically, and by its peculiar shape and warty appearance easily distinguishes the blue gum from other Victorian eucalypts. The fruit is large and three to five, rarely six, celled.

The seedling plants and suckers are of a waxy powdery bluish whiteness, have sharply four-cornered stems, and opposite stalkless heart-shaped or oval heart-shaped leaves.

The botanical name "globulus" refers to the button like appearance of the caps of the blossoms.

In its native habitat the Blue Gum is a tall tree, when planted in the open it grows bushy but is not suitable for dry and hot districts.

In a state of nature it flowers during October, elsewhere generally in Winter. It is freely worked on by bees for both pollen and nectar, but the character of the honey is not yet definitely known, but it probably resembles that of the succeeding and closely-allied species, the Spotted Blue Gum.

Fig. 15.—The Blue Gum (*Eucalyptus globulus*, Labillardière).

The Spotted Blue Gum (*Eucalyptus Maideni*, F. v. M.).

Fig. 16.

A tree known as Blue Gum and Spotted Gum in different localities, and sometimes erroneously taken for the true Blue Gum (*E. globulus*). It is always a tall, straight-growing tree attaining a height of up to

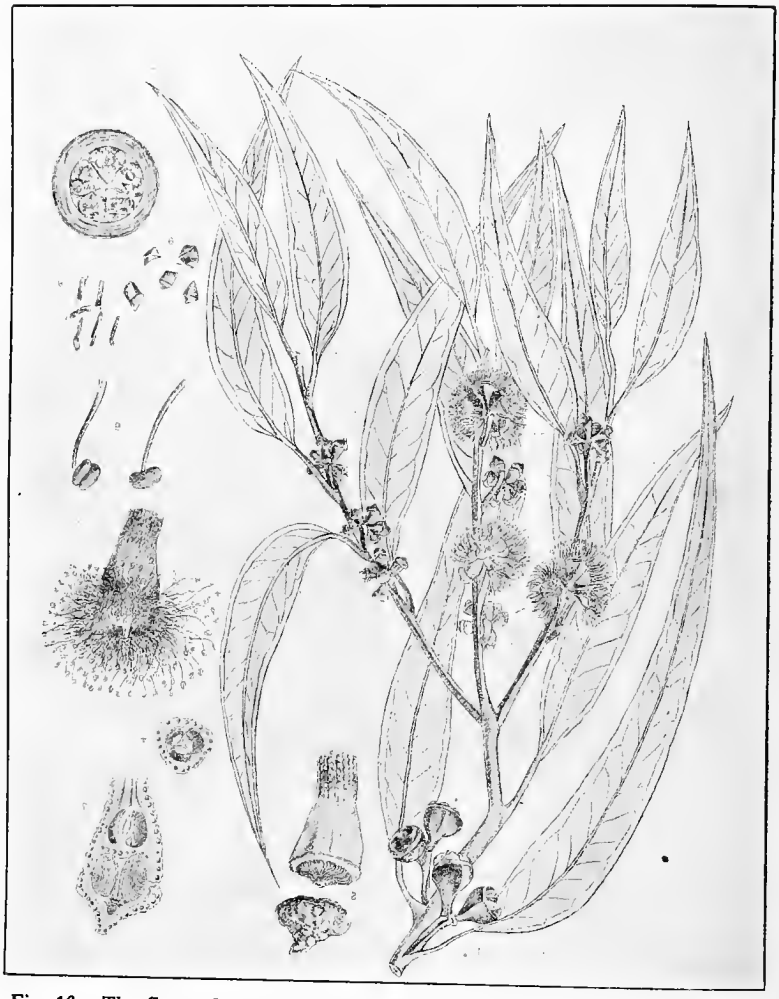


Fig. 16.—The Spotted Blue Gum (*E. Maideni*, F. von M.). (Adult foliage.)
[From Proceedings, Linnean Society, N.S.W., 1889.]

150, or even 200, feet, with a diameter up to 4 feet with a smooth chalky white or bluish bark, hence its local name Blue Gum.

The sucker leaves are very large, frosted or even chalky white, round or heart-shaped, stalkless, and stem clasping on sharply angular branchlets. In changing to the adult foliage the sucker leaves gradually become alternate and stalked, oblong and lance-shaped, often very narrow

lance-shaped and more or less curved, attaining in the mature state a length of 12 inches or more, and resembling much the leaves of the Mountain Gum (*E. goniocalyx*), sometimes found in the same district, but not quite so lustrous on the upper side; the veins are distinct, the marginal one removed from the edge. The flowers are few, stalkless, at the shoulders of leaves on a much flattened cluster stalk. The flower

Fig. 17.—The Spotted Blue Gum (*E. Maideni*, F. v. M.). (Juvenile foliage.)
[From Proceedings, Linnean Society, N.S.W., 1889.]

cup is angular or flattened, the lid of the bud much constricted and warty.

Fruit, $\frac{1}{2}$ inch in diameter, thus much smaller than that of the real Blue Gum (*E. globulus*) top shaped to somewhat half-round.

The Spotted Blue Gum in general appearance resembles the Blue Gum (*E. globulus*) and the Mountain Gum (*E. goniocalyx*). From the

latter, with which it grows in company on the mountain slopes, it is often not readily distinguished, trunks and foliage of the two trees having much the same appearance. They differ, however, in their fruits and sucker leaves, so that there is little difficulty in distinguishing them. They also differ in their timber, while that of the Mountain Gum (*E goniocalyx*) is of a dirty brown colour that of the Spotted Blue Gum is of a yellow tint. Though not much used, except occasionally for wheelwright's work, it is nevertheless a good durable timber. The honey is of a clear golden colour, the secretion of nectar being generally profuse.

The Manna Gum (*Eucalyptus viminalis*).

Fig. 18.

This Eucalypt, which is also known as White Gum and Ribbony Gum, is widely distributed over Victoria, but except on alluvial flats it does not appear to occur anywhere in large numbers together, but rather scattered, or interspersed, between other trees, such as Red Gum, Stringybark, Messmate, Blue Gum, and Swamp Gum (*E. ovata*).

In open country it is not a tall tree, but when found in close forest often attains great height and stem diameter. There is great variation in the appearance of the trunk of this tree in different localities, and sometimes even between individual trees growing side by side; a rough, hard bark generally covers the base of the stem, while the upper portion is usually smooth, and white in colour. During the change of seasons the smooth portion of the bark becomes detached from the trunk in long strips, hence the name Ribbony Gum. In some specimens, however, the rough scaly bark persists to, or even partly, on the branches, while in others almost the whole of the trunk and branches are smooth and clean.

The leaves are long, lance-shaped, slightly curved, of the same colour on both sides, the veins rather faint, spreading feather-like, the marginal vein somewhat removed from the edge of the leaf. The clusters are generally, but not necessarily, three flowered, with the buds, flowers, or fruits in line. The buds are oval, more or less pointed, the fruits half-egg shape, with three, four, or, rarely, five cells.

The wood, which is from pale to brown in colour, makes good fire wood, and is fairly durable when cut and seasoned, but the standing trees are apt to rot at the centre. When found at high elevations it yields a useful building timber.

This tree is well known on account of the manna it produces, usually during midsummer; it is, however, at times difficult to distinguish it from several others, such as Swamp Gum (*E. ovata*) and Apple Box (*E. Stuartiana*), both of which it somewhat resembles. Reference to the illustrations, Figures 18 and 9 will, however, show that the sucker leaves of each are quite distinct, for while those of *E. viminalis* are narrow lance-shaped, with a roundish base, the sucker leaves of *E. Stuartiana* are roundish, and of *E. ovata* egg-shaped.

The Manna Gum is somewhat irregular in its habits of flowering and the length of time it is in bud. Two generations of the latter may often be seen on the same branches of a tree, one which will blossom within a few months, and the other which may not do so for eighteen. The flowering most frequently occurs after that of Red Gum, but may

occur almost any month of the year. As this tree does not, as a rule, grow in very large numbers, except on alluvial flats, in any one locality, it does not produce large and distinct yields of honey, but, owing to its flowering occasionally when other bee forage is scarce, and producing pollen as well as nectar, it is a very useful tree to the beekeeper.

The honey has a distinct sweetness of its own; is clear amber in colour, not very dense, and candies rather readily.

Fig. 18.—The Manna Gum (*Eucalyptus viminalis*, Labillardière).

There is perhaps no other species of Eucalypt which varies so much in general appearance in different surroundings, for while in some districts the Manna Gum is a tall, straight, stately tree, with upper trunk clean and smooth, in other localities, particularly in dry country, it is sometimes quite stunted, with drooping branches, and covered with a rough bark from the ground to the smaller limbs.

THE CANDLE BARK GUM (*Eucalyptus rubida*, Deane and Maiden).

Fig. 19.

This tree is also known as Flooded Gum, Bastard White Gum, Ribbony Gum, and Drooping Gum. The name Candle Bark is in reference to the smooth and sometimes frosted or chalky bark of the trunk.

The bark is perfectly smooth for the most part, the outer layers falling off in ribbons. It frequently shows reddish or plum-coloured patches, hence the specific name, "rubida." This colouration, which is generally most conspicuous at the end of summer, is, at times, beautiful when viewed from a distance, ranging from pale salmon colour to bright crimson and purple.

In general appearance, adult leaves and fruits, this tree closely resembles the Manna Gum (*E. viminalis*), in the company of which it is often found. The Manna Gum, however, does not show the colouration of the bark of the Candle Bark Gum, and the latter has a smooth clean trunk and round to oblong sucker leaves of lighter green than the lance-shaped sucker leaves of the Manna Gum.

The mature leaves are dull green on both sides, narrow, lance-shaped, and of thickish texture. The veins of the leaf roughly transverse, the marginal vein close to the edge. They are often frosted with a whitish bloom. Sucker leaves from nearly round to oblong blunt ended, they are opposite, often stem-clasping, and even sometimes opposite leaves more or less joined round the stem. The buds are egg-shaped, in threes, arranged in the shape of a cross, as in the Manna Gum (*E. viminalis*) on short stalklets. Lid of the bud nearly half round when mature, hardly pointed. The fruit is top-shaped, spreading at the mouth, sometimes nearly half round, shining or frosted, three or four celled. The timber is red when fresh, but dries pale; it is of little use.

The Candle Bark Gum blossoms in most localities in January and February, usually a little before the Manna Gum, when the two occur in the same locality. Like the Manna Gum, it is in bud from twelve to fifteen months, two generations of buds being therefore in sight just before it blooms. It yields pollen as well as nectar, and the honey, so far as is known, is identical with that of Manna Gum.

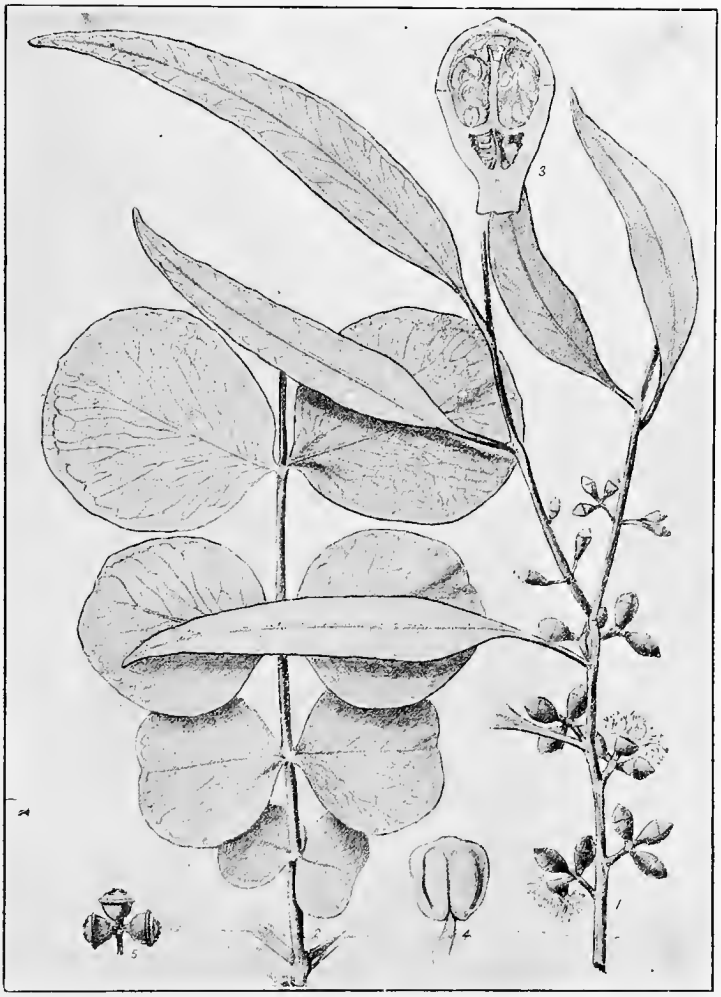


Fig. 19.—The Candle Bark Gum (*Eucalyptus rubida*, Deane and Maiden).
[From Proceedings of the Linnean Society, N.S.W., 1899.]

The Gully Gum (*Eucalyptus Smithii*, R. T. Baker).

Fig. 20.

A ribbony barked tree of considerable size. It has smooth limbs, and most of the butt is smooth. It is closely allied to the Manna Gum (*E. viminalis*), quite identical with the latter in adult as well as in sucker leaves, but while the flower buds of the Manna Gum always occur

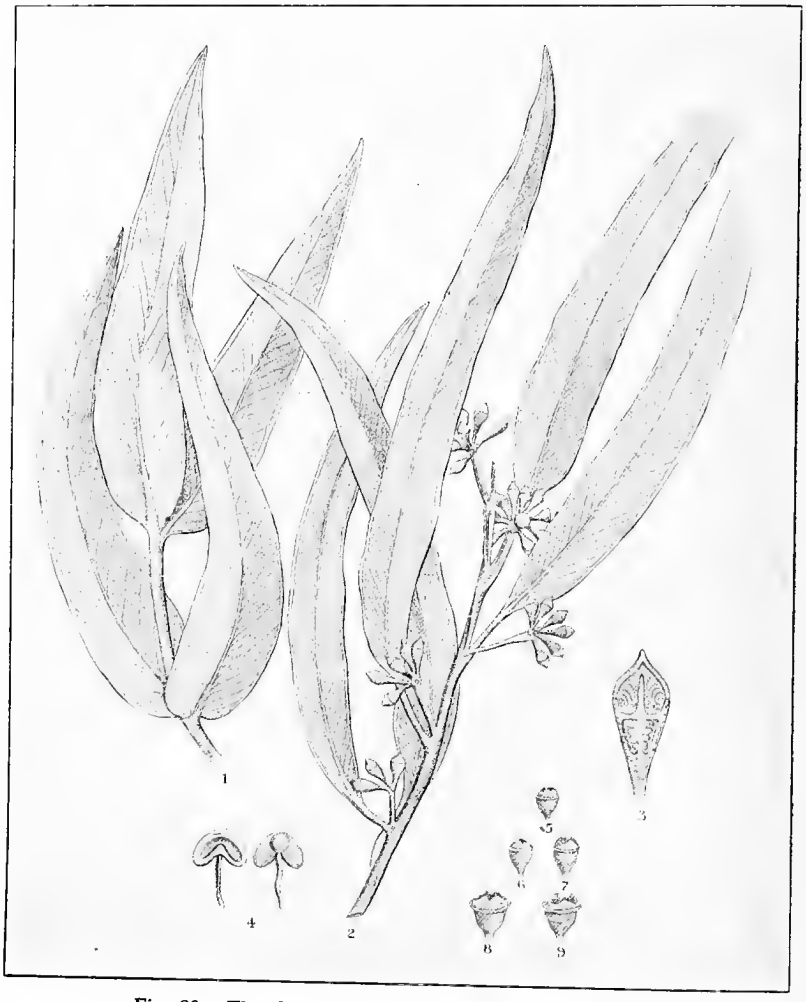


Fig. 20.—The Gully Gum (*E. Smithii*, R. T. Baker).
[From R. T. Baker and H. G. Smith, "Research on the Eucalypts, &c."]

in threes (or less) the clusters in the case of the Gully Gum usually contain seven flowers, while the rough bark sometimes continues further up the stem than with the Manna Gum, of which it was formerly held to be a variety.

The timber is close grained, hard, and difficult to work. In Victoria the Gully Gum is found in Gippsland gullies.

THE WHITE BRITTLE GUM (*Eucalyptus maculosa*, R. T. Baker).

Fig. 21.

A tree also known as Spotted Gum and Brittle Gum, rarely exceeding 60 feet in height, usually from 20 to 40 feet. The bark is smooth right down to the ground. The sucker leaves are of thin texture, lance or

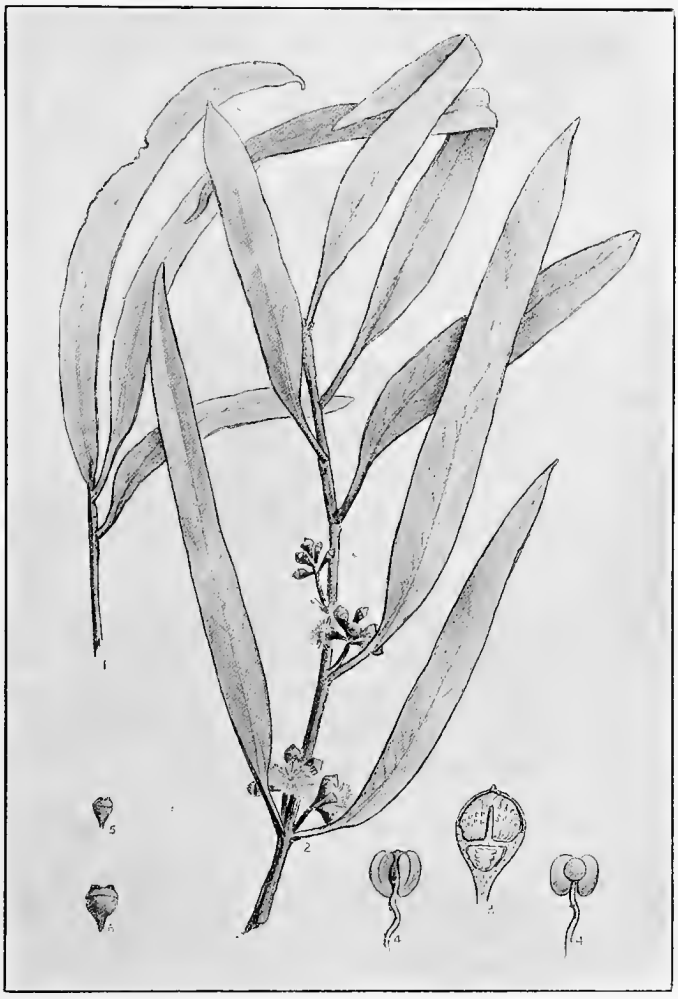


Fig. 21.—The White Brittle Gum (*E. maculosa*, R. T. Baker).
[From Proceedings, Linnean Society, N.S.W., 1899.]

oval lance-shaped, 2 or 3 inches long, opposite or alternate with the marginal vein removed from the edge of the leaf. The adult leaves are lance-shaped or narrow lance-shaped, curved, not shining and of the same colour on both sides. The veins of the leaves are only faintly

marked or rather obscure. Some trees have the leaves quite rigid and erect.

The clusters of from four to sixteen or even twenty flowers are at leaf shoulders, buds stalkless or on very short stalks, top-shaped, lid blunt and of equal length to the lower part of the bud. Fruit half-round to top-shaped with valve flaps projecting in ripe fruit.

The timber is straight grained and easy to work, but seasons badly, and is of little value on account of the presence of Gum veins.

The White Brittle Gum grows in poor, open forest ground to a maximum height of 60 feet with a stem diameter of 1 to 3 feet, and a rather dense head. The bark is different shades of grey or bluish yellow with spots like those of the true Spotted Gum (E. *maculata*).

The Swamp Gum (*Eucalyptus ovata*. Syn. *E. paludosa*).

Fig. 22.

The Swamp Gum, Cider Eucalypt, White Gum, grows usually on alluvial flats, particularly in swampy places. It is generally not a tall tree, often of crooked growth, and sometimes dwarfed. In general appearance of the trunk and in the bark it resembles the Manna Gum to a certain degree. The bark is often rough, dark or greyish brown at the butt, and sometimes so up to the main limbs; in other cases, smooth on the stem and the branches, and greyish white in colour. The branches are very spreading. The wood is fairly hard, but as it is rarely straight not much used except for fuel. It makes excellent charcoal. The leaves generally have a twist, are lance-shaped, rather pointed at the base, and of equal deep green on both sides, the veins rather distant, moderately spreading, and the marginal vein distinctly removed from the edge of the leaf. The sucker and seedling leaves are oval. The umbels occur singly at the shoulders of leaves, or laterally from the branchlets, and carry from three to ten flowers; the buds are egg-shaped, short pointed, the fruit top-shaped, three, four, or, rarely, five celled.

This tree flowers, usually not very profusely, in autumn; nothing definite is known yet as to the length of time it is in bud. Pollen is gathered from the blossom by bees. The honey is clear amber in colour, not dense, candies, and closely resembles that of Manna Gum. The Swamp Gum is distinguished from the Manna Gum by the broader and shorter leaves, their darker green, and more distant veins, the different grouping of the flowers, and the oval sucker and seedling leaves, as contrasted with the narrow lance-shaped ones of the Manna Gum.

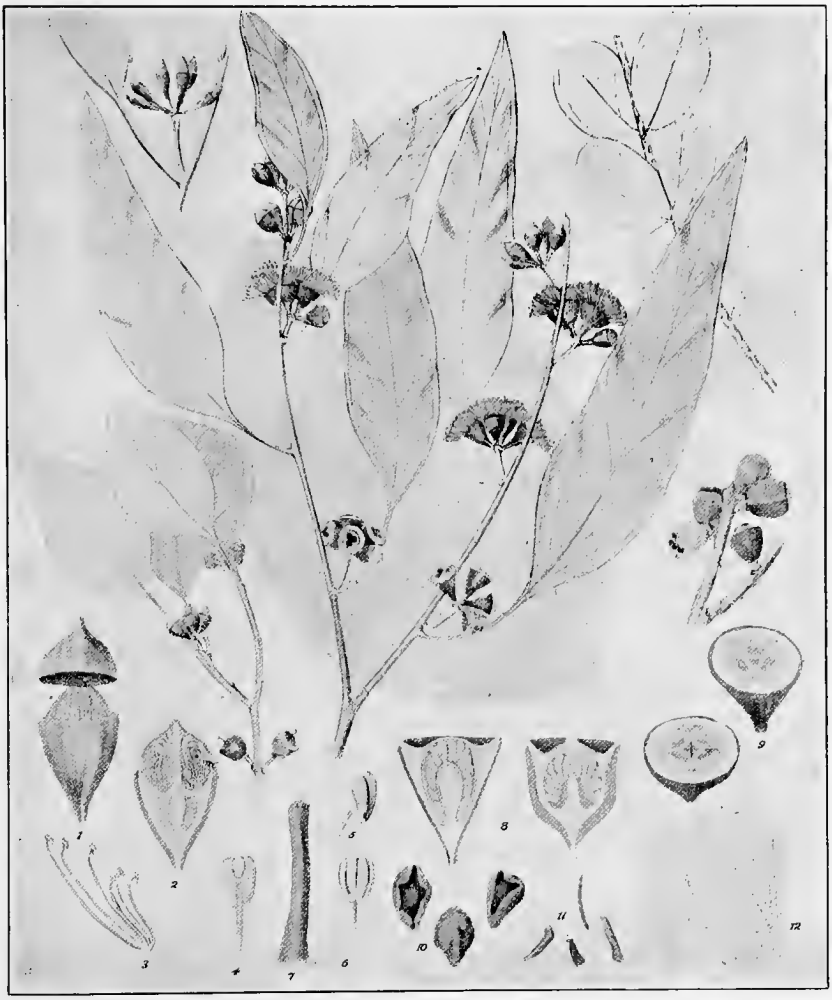


Fig. 22.—The Swamp Gum (*Eucalyptus ovata.* Syn. *E. paludosa*).

The Cider Gum (*Eucalyptus Gunnii*, Hook, F.)

A shrub or small tree found in Victoria only at high elevations in the north-eastern part, attaining a diameter of 12 inches, and sometimes a height of 30 feet.

The specific name Eucalyptus Gunnii is now only applied to this species, but formerly included the Swamp Gum (*E. ovata*), the Sallow Gum (*E. camphora*), and the Dwarf Gum (*E. Kitsoniana*), all of which are now recognised as distinct species.

The bark of the Cider Gum is smooth. A number of stems spring from a broad expanded root base, a feature which is characteristic of this species.

The leaves are frosted, and variable in size and shape, stem-clasping, stalkless, heart-shaped, round, egg, or egg lance-shaped, and occur opposite or alternate on the rounded branchlets. The lateral veins of the leaves are oblique spreading, the marginal vein well removed from the edge of the leaf. Flowers at shoulders of leaves in short tufts, in threes on a short stalk or stalkless, buds bell-shaped, with short pointed lid, which overlaps the lower part of the bud. The fruit is half-round to cylinder-shaped, with a thickened rim.

A pale-coloured wood. This tree is called Cider Gum on account of a cider-like beverage having been made from the sap.

The Dwarf Gum (*Eucalyptus Kitsoniana*, Luehmann and Maiden).

A dwarf tree. It usually does not grow higher than 4 to 5 feet, but at Foster it is found 18 to 20 feet in height. Bark smooth in texture, and ashy grey in colour, lighter in the higher branches.

Juvenile foliage oblong to broadly lance-shaped, with very short stalk, or stalkless leaves, rounded at the end, or terminating in a blunt point, even-sided, and of leathery texture. Veins well marked, spreading marginal vein a considerable distance from the edge of the leaf.

Mature Foliage.—When in the flowering state, this tree has sometimes a few oblong lance-shaped leaves, but they vary in all degrees of width up to 4 inches long by ½-inch wide. Fully developed leaves have the marginal vein close to the edge, and are on stalks up to 1-in. long. Buds with conical lid, the flower cup on a broad (strap-shaped) stalk. Flowers in a head of usually seven, but may be as few as three. Fruit half-round, or more or less conical through mutual pressure, smooth or slightly angled, three, four, or five celled.

The Dwarf Gum grows in poor, boggy country in the low-lying tracts, but also occurs in the drier hills at Foster. The oil of this species is valuable.

The Neglected Gum (*Eucalyptus Livingstonia*, Maiden).

A dwarf tree like the one previously described, and closely allied to it. It differs, however, from the Dwarf Gum, having broader leaves, smaller, and less angular buds and fruits. It grows in swampy places near the Great Dividing Range, at Omeo.

The Sallow Gum (*Eucalyptus camphora*, R. T. Baker).

Fig. 23.

A small tree, about 20 to 40 feet in height, with a black, shedding bark. Mature leaves, egg-shaped long, abruptly pointed, under 4 inches long, or lance-shaped, pointed, and 6 inches long, somewhat leathery and frosted. The veins are distinct, particularly in young

leaves, the marginal vein away from the edge. The sucker leaves are egg-shaped (2, 3, 4, Fig. 23), blunt, under 6 inches long, and 3½ inches wide, on angular stalks ½-inch long, leathery, and frosted. The clusters of flowers are few, on flattened stalks at shoulders of leaves, bearing five or six short-stalked, top-shaped, and pointed buds.

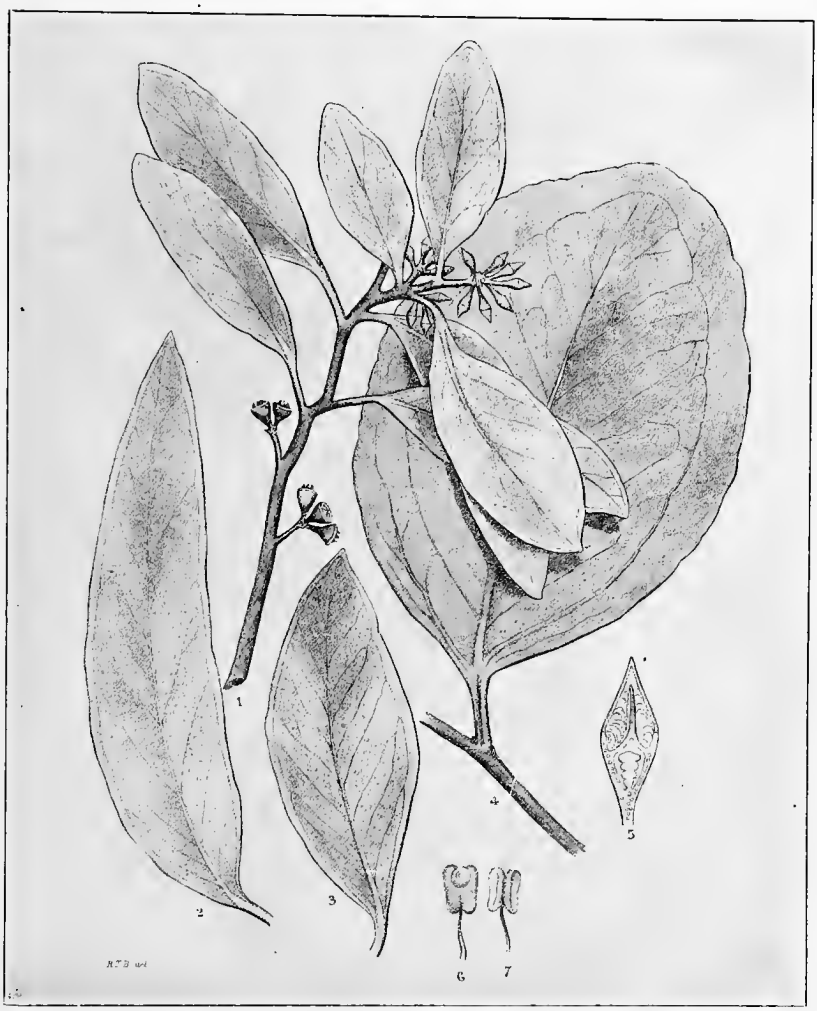


Fig. 23.—The Sallow Gum (*Eucalyptus camphora*, R. T. Baker).
[From R. T. Baker and H. G. Smith, "Research on the Eucalypts, &c."]

The Sallow Gum is usually found in company with the Black Sallee (*E. stellulata*) and the Swamp Gum (*E. ovata*).

From the Black Sallee it is easily distinguished by its leaves, although otherwise in appearance of growth, branches, bark, &c., the two resemble each other somewhat. Its branches, however, never have that yellow, green colour, which is so characteristic of the Black Sallee (*E. stellulata*), but are of an ashy grey or brownish grey colour, sometimes approaching to a sooty black.

The Spotted Gum (*Eucalyptus maculata,* Hooker).

Fig. 24.

A handsome tree, with a straight stem sometimes of a length of 90 feet up to the branches, and a diameter up to 3 feet. The bark is smooth, somewhat shining, whitish or sometimes reddish-grey, mottled by bluish-white or brown-reddish spots, hence the vernacular as well as the botanical name. Leaves scattered on slightly angular branchlets, elongated or narrow lance-shaped, often somewhat sickle-shaped, seldom more oval, of equal green on either side, more or less shining, sometimes but slightly so; their lateral veins crowded, spreading and rather prominent, the marginal vein close to the edge of the leaf. Flowers in usually short tufts, two or three together or some solitary, rarely four or more, two umbels occasionally arising from one point appearing like one, with six or seven flowers; the somewhat angular stalklets are shorter than the flower cup, the tube of which is almost half egg-shaped or slightly bell-shaped; the lid of the bud is double, the outer one half-round and pointed, the inner one depressed semiglobular, almost or quite blunt, transparent and shining; fruits globular or oval urn-shaped, with three, rarely two or four, deeply enclosed valves. The fruits vary from $\frac{1}{3}$ to $\frac{2}{3}$ of an inch in length, slightly rough or faintly wrinkled.

The timber is used in shipbuilding, wheelwright work, frame work, and street paving.

The true Spotted Gum is a New South Wales tree only extending slightly into Victoria across the eastern border. No information as to its flowering habits, nectar, and pollen production is yet available.

Fig. 24.—The Spotted Gum (*Eucalyptus maculata*, Hooker).

The Shining Gum (*Eucalyptus nitens*, Maiden).

A very large tree, growing to a height of 200 to 300 feet, with a stem diameter from 2 to 17 feet. It is closely related to the Mountain Gum (*E. goniocalyx*) (Fig. 25) of which till lately it was considered a variety, but is now classed as a distinct species. It is known by local names, such as White Gum, Silver Top, and Silver Top Gum in reference to the smooth and shining bark of the upper part of the trunk.

The bark is of the White Gum kind, hanging in strips, and more or less rough at the butt, the upper portion of the trunk smooth and even shining.

The timber is straight in the grain, flesh-coloured when fresh, but drying very white.

The leaves in the mature state of the tree are lance-shaped, slightly curved, nearly even-sided, equally green on both sides, somewhat shining and thickish, the veins spreading, the marginal vein distant from the edge of the leaf. Mature leaves may attain a length of over 12 inches, and a width of 3 inches, but usually they are much smaller: juvenile leaves, bluntly lance-shaped, or heart-shaped and stem-clasping, equally green on both sides and somewhat frosted; branchlets square and even-winged (as in Blue Gum seedlings).

The buds are usually pale-brown, curved and angled, up to seven in a head, six stalkless buds surrounding a central one on a common stalk ½ inch long; lid of bud pointed and longer than the flower cup.

Fruits shining, up to seven in a cluster, egg-shaped, slightly angled.

The Shining Gum is found in Victoria near Mount Baw Baw and similar localities.

As already stated, the Shining Gum is closely related to the Mountain Gum (*Eucalyptus goniocalyx*). The differences which separate the two species are—

1. The Shining Gum attains a size never attained by the Mountain Gum.

2. The timber of the former species appears to be fuller in the grain, less interlocked and less durable than that of the Mountain Gum.

3. The young branchlets of the Mountain Gum (*E. goniocalyx*) do not appear to be winged at any time, as in the species here described.

4. The fruits of the Shining Gum (*E. nitens*) are much smaller and shinier than those of the Mountain Gum (*E. goniocalyx*).

In regard to nectar and pollen production no distinct and separate information is available, as the Shining Gum has so far not been distinguished as a distinct species by apiarists.

Grey Gum or Mountain Gum (*Eucalyptus goniocalyx*).

Fig. 25.

As mentioned above, the botanical name, *E. goniocalyx*, is now applied to the Mountain Gum only, which also passes under the vernacular names of Mountain Ash, Grey Gum, White Gum, Spotted Gum, and

Bastard Blue Gum. As already indicated, it is almost identical with the Long-leaved Box in leaf, flower, and fruit, but, as distinguished from the latter, it is a tall, straight tree, occasionally exceeding 200 feet in height and attaining a stem diameter up to 6 feet; the wood is hard and tough, varies in colour from a pale yellowish to a brownish colour; it is very durable, and lasts well underground; it is used by wheel-

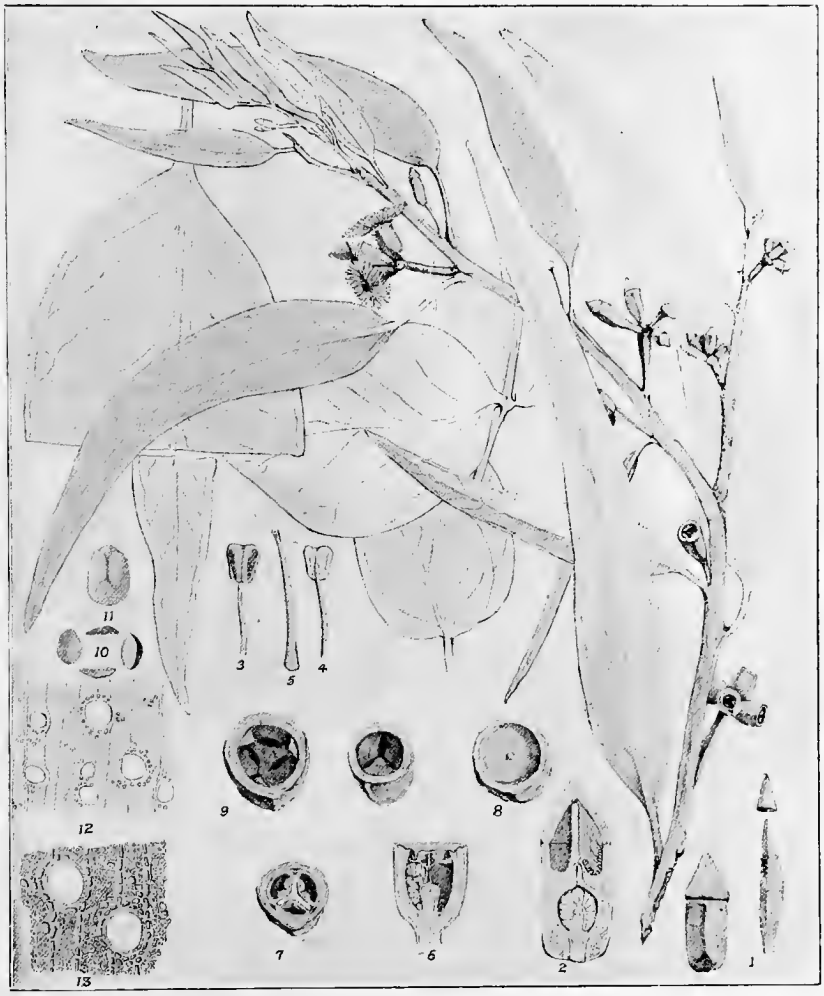


Fig. 25.—The Mountain Gum (*Eucalyptus goniocalyx*, F. v. M.).

wrights and in boat building, for railway sleepers, planks, piles, and general building purposes.

It flowers every second year from March to July; the honey is amber in colour and of fair quality.

White Sallee (*Eucalyptus coriacea.* Syn. *E. pauciflora*).

Fig. 26.

A medium-sized tree, but sometimes attaining a height of 100 feet; it is known by several other vernacular names such as White Gum, Willow Gum, White Sallee, distinguishing it from Black Sallee (*E. stellulata*), Tumble Down Gum by reason of its aspect, Glassy Gum on account of the glassy appearance of the upper bark; while in Tasmania, on account of its scrambling nature, it is called Weeping Gum.

In Victoria it is found in the southern districts on the lowest hills and the highest mountains. The timber is pale-coloured, full of gum veins, and warps a good deal; the limbs bend and twist without breaking; its chief local uses are for fuel and fencing posts, as it is very durable. The bark is distinctly of the White Gum type, the trunks of the trees being mostly quite clean down to the ground.

The leaves are scattered on the branchlets, leathery, yet often succulent, long lance, but sometimes somewhat sickle shaped, or merging into the oval form. They are of equal colour and shining on both sides, the veins very oblique, almost parallel to the mid-rib. The flower clusters, which occur mostly singly at the shoulders of leaves, but sometimes form a spray, carry from few to many flowers; the buds are round-ended, more or less pointed; the fruits are half-round to cup-shaped, three, more rarely four or five celled.

This is a very profusely flowering eucalypt, yielding honey of the White Gum type, clear, transparent, of a golden colour, but not of high density. As in other species it varies somewhat in colour and character, according to soil, climate and elevation. Pollen is gathered by the bees from the flowers, as from all other trees known as White Gums with the exception of *E. leucoxylon* (The Yellow Gum), which passes as a White Gum in some localities. As with most of the White Gums, the time of flowering is very variable, and the length of time the White Sallee is in bud has not so far been ascertained.

The Snow Gum (*Eucalyptus coriacea.* Var. *alpina*).

This is a variety of the White Sallee, frequently high mountain localities. It has short and nearly straight leaves, and is but a tall shrub or small tree, with more or less whitish bloom on the foliage.

The trees of this species at the highest elevations are remarkable for their bare stems, surmounted with a dome or flattish top of leaves. The bare stems are doubtless the consequence of winds, the leaves being concentrated on top as a thin layer, and offering a minimum resistance to the wind. A fruiting twig of this variety is shown in the right top corner of the illustration (Fig. 26).

Fig. 26.—White Sallee (*Eucalyptus coriacea.* Syn. *E. pauciflora*, A. Cunn.).

The Black Sallee (*Eucalyptus stellulata*).

Fig. 27.

A tree attaining a height of 50 to 100 feet, but the diameter rarely exceeding 2 to 3 feet; at high elevations it is of a scrubby growth, and is known as Black Sallee, this word being a corruption of sallow or willow. It is also called "Black Gum" owing to the rough hard dark bark on the butt, and "Green Gum" on account of the greenish or bronze coloured bark on the upper portion of the stem.

The timber is pale coloured, rarely free from gum veins, and of little value except for fuel. This is a gum, or smooth-barked eucalypt; it has, however, more or less rough bark towards the butt, which in old trees is hard, rough and black; the upper part of the trunk is, as already mentioned, greenish, bluish, or white.

The leaves are scattered, on rather short stalks, oval lance to narrow lance shaped, shining, and of equal colour on both sides, the veins almost lengthways of the leaf. The flowers are very small, almost stalkless, very numerous, six to fifteen arranged star-like in the cluster (hence the botanical name *E. stellulata*). The buds rather long and conical; the fruits are very small, half-round or cup-shaped, and mostly three-celled.

In Victoria the Black Sallee is found on the Mitta Mitta and Ovens Rivers, and the Dargo High Plains. There is a narrow-leaved variety growing at higher elevations, which is of a shrubby habit.

No information is yet available as to the value of this tree to bee-culture.

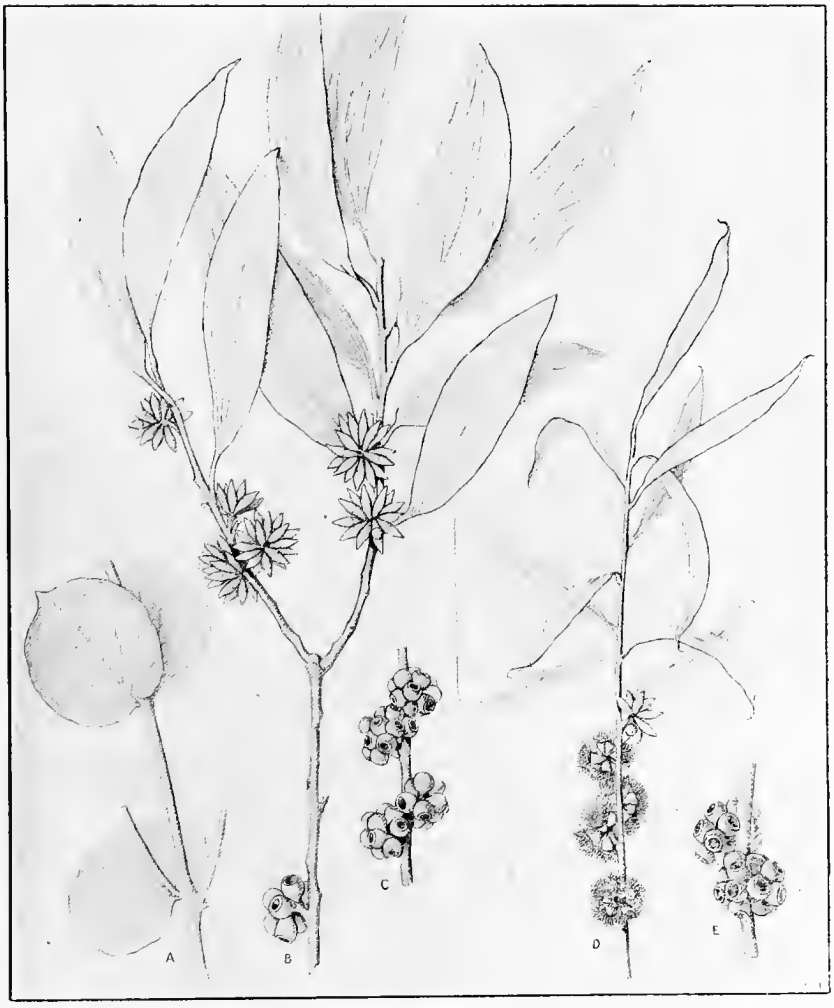


Fig. 27.—Black Sallee (*Eucalyptus stellulata*, Sieb.).

The Scribbly Gum (*Eucalyptus hæmastoma*, Smith).

Fig. 23.

Finally, a tall tree, with frequently quite smooth bark, or less usually persistent on the stem, but on the branches smooth to a great extent; it occurs, however, also occasionally with bark persisting up to the last branches, and would then come under the category of stringybarks, while in the ordinary form, with persistent bark on the trunk and smooth branches, it is apt, when judged by general appearance, to be mistaken for Blackbutt (*E. pilularis*), and passes under the latter and several other misleading local names.

The leaves are scattered on the branchlets, lance-sickle shaped, occasionally much narrower, but exceptionally also verging into a somewhat oval form, shining and of equal green on both sides, the veins running more with, than across, the leaf; the marginal vein somewhat removed from the edge. The umbels are mostly solitary, at shoulders of leaves, or lateral on branchlets or some in a short spray on angular and often somewhat compressed stalks, with from five to ten or rarely more flowers in each umbel. Tube of calyx (flower cup) broadly conical, about twice as long as the half-round depressed or slightly pointed small lid of the bud; the tube is not angular, and tapers into a somewhat long stalklet. Fruit half egg-shaped, with a rim of brownish-red colour, from which the species derives its systematic name, it is four, or less frequently, five-celled, the rim depressed or quite flat; valves very short.

The wood is not of any great value, not being durable, but it furnishes fair fuel. In Victoria the Scribbly Gum is found in the eastern part of the State.

The Scribbly Gum, formerly known as Brown Messmate, flowers every third year, and the honey is not first-class.

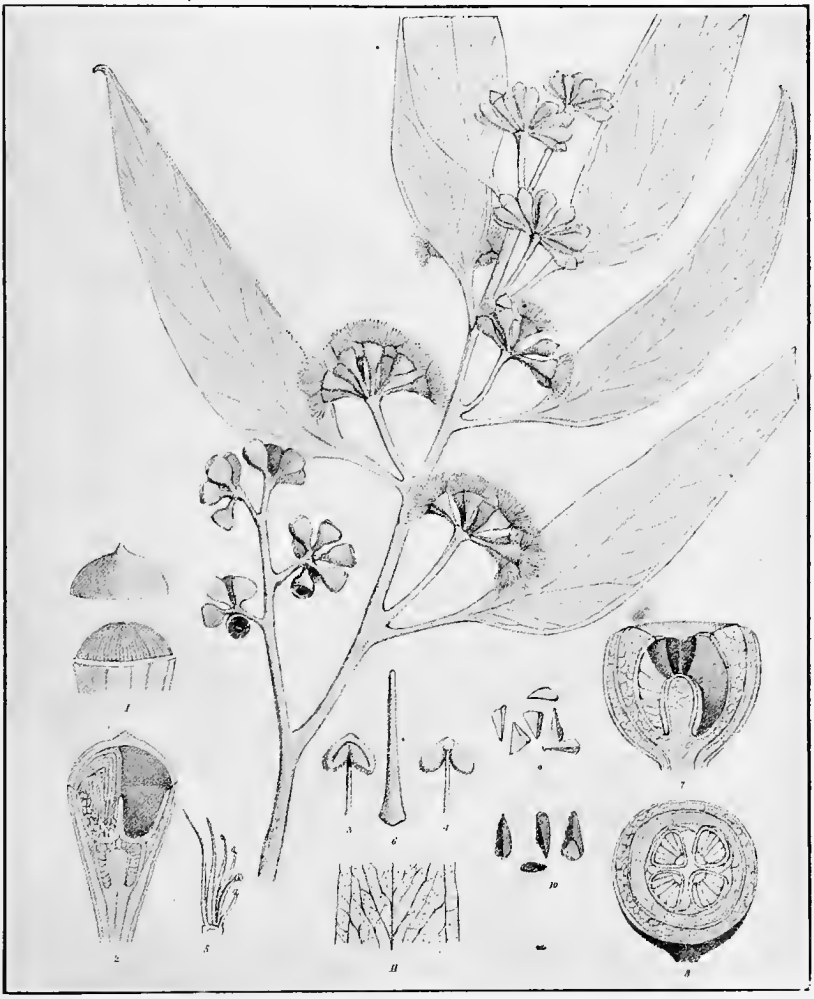


Fig. 28.—The Scribbly Gum (*Eucalyptus hæmastoma*, Smith).

THE SANDAL GUM (*Eucalyptus diversifolia.* Syn. *E. santalifolia*, F. v. M.).

Fig. 29.

A tall shrub, flowering, however, already at a height of 5 feet. In sandy desert country, as also in scrubby valleys or on arid ridges, restricted to regions near the coast, and occurring in Victoria in the Portland district.

Leaves scattered on firm angular branchlets, thick, narrow or rarely broad-lance shaped, almost straight or somewhat curved, of equal colour and shining on both sides on moderate or short stalks; veins very faint, almost obliterated, marginal vein somewhat distant from the edge of the leaf. The specific name was devised by some resemblance of the leaves to those of sandalwood. The clusters of flowers occur singly at shoulders of leaves, but later laterally, containing three to five, rarely six to eight flowers; stalks of clusters scarcely or somewhat angular, the stalklets of buds and flowers extremely short or almost none; tube of flower cup nearly half round and somewhat shorter than the half egg-shaped conical upper part of the bud; fruits depressed globular, three to four, occasionally five, celled. The Sandal Gum resembles the Brown Stringybark in the almost total absence of flower stalklets, but it does not attain the size of a large tree; the leaves are smaller, more rigid, of a lighter green, less conspicuously veined, and not so unevensided. The flowers are generally less numerous on each stalk, and the fruits usually smaller. The Sandal Gum is a good oil yielder.

As a source of nectar, it promises well, but, so far, it has only been observed for a short period.

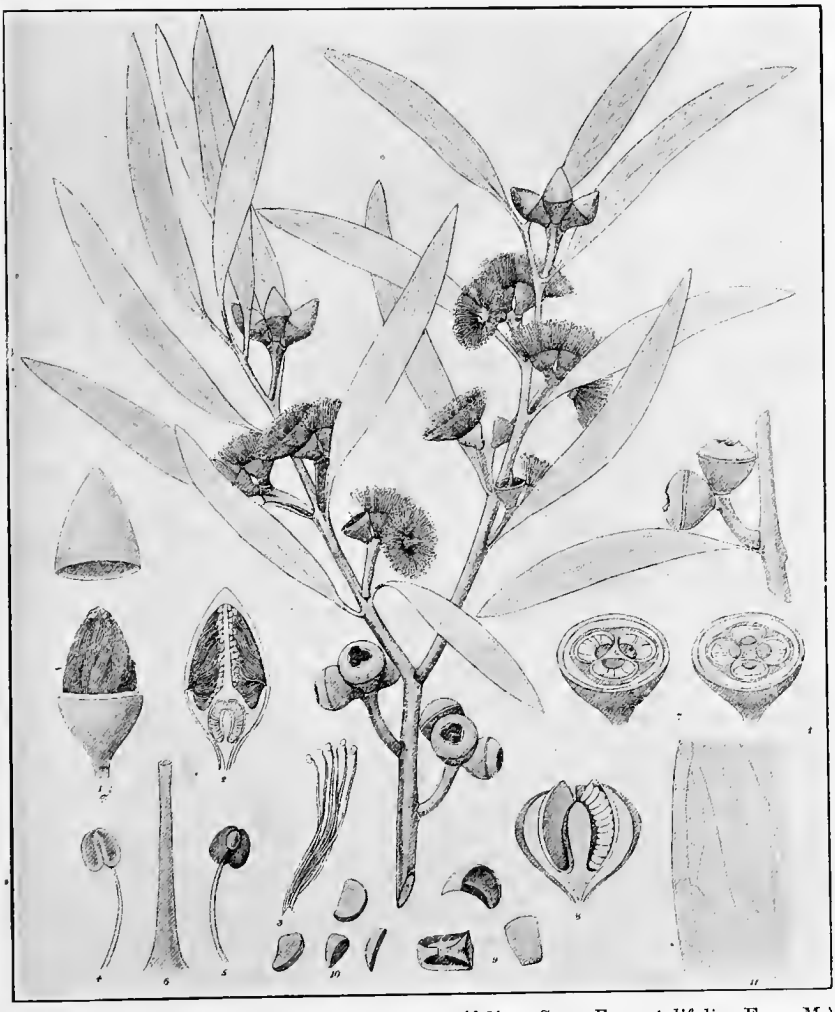


Fig. 29.—The Sandal Gum (*Eucalyptus diversifolia.* Syn. *E. santalifolia,* F. v. M.)

III. Stringybark Group.

The Messmate (*Eucalyptus obliqua*).

Fig. 30.

The Messmate, in South Australia and Tasmania called Stringybark, is generally a straight stemmed tree of rapid growth attaining a maximum height of 300 feet in country with a good rainfall, usually found in the company of Stringybark (*E. macrorrhyncha*) and Peppermint (*E. Australiana*), but also occurring in a stunted form on sandy heath ridges, with Apple Box (*E. Stuartiana*) and Brown Stringybark (*E. capitellata*).

The wood is pale to brownish yellow in colour, usually free in the grain and then used for splitting into posts and rails and to a lesser extent into palings and shingles, it also supplies a large portion of the ordinary sawn hardwood for building purposes.

The bark is very fibrous but rather soft and fragile, inside light brown, outside greyish or after fires black; it ignites easily and the Messmate therefore carries bushfires along more than most other trees. The bark is to some extent used for roofing rough buildings, but is not so suitable for this purpose as that of Stringybark.

The leaves are scattered sickle—or sickle—lance-shaped, equally green and shining on both sides; their lateral veins not very spreading, but rather prominent, the marginal vein somewhat removed from the edge of the leaf. The leaves of young saplings are broad, somewhat heart-shaped.

The clusters (umbels) contain from three to twenty flowers, and grow from the shoulders of leaves or sideways from the branchlets. The stalks of the umbels are slender and rather long, the flower buds long, tapering towards the stalk, and have a half-round or slightly pointed top. The fruit is cup-shaped with three to five cells (compartments).

The buds appear from nine to eleven months before blossoming, which takes place generally in February. The honey is one of the darkest, particularly so in wet locations, reminding somewhat of molasses. Pollen is gathered by the bees from the blossom, and as the Messmate blooms late in the season it may be found useful in building up colonies for autumn and supplying them with winter stores.

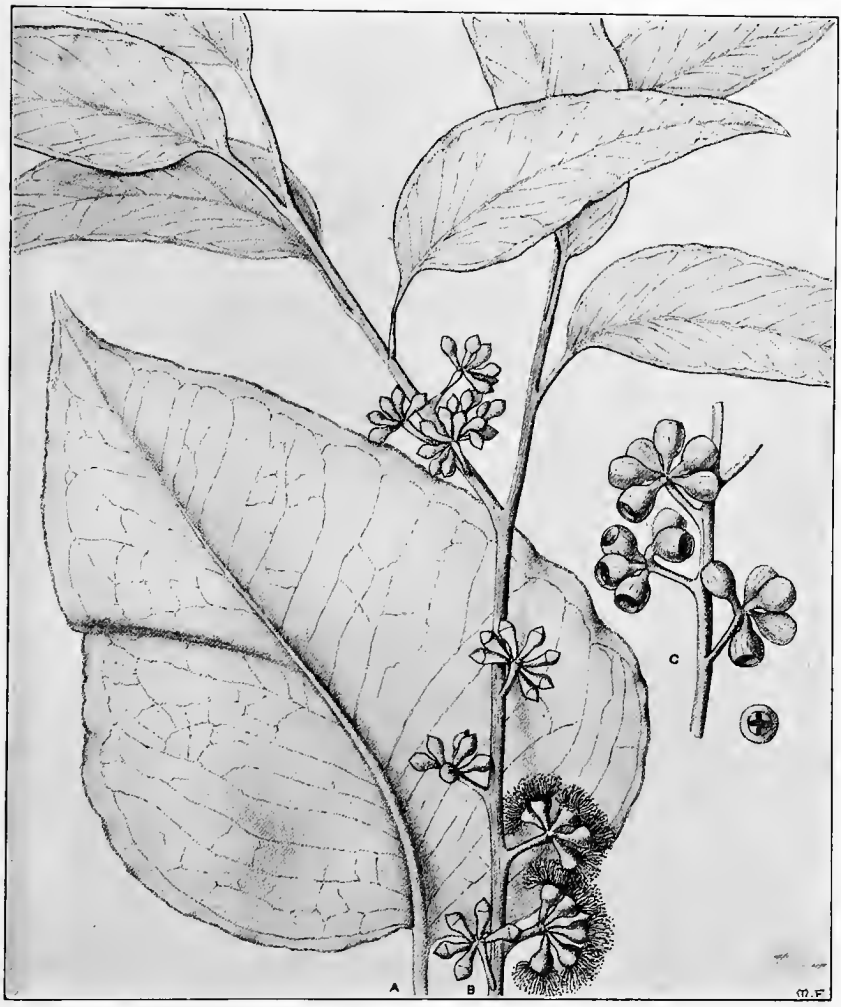


Fig. 30.—The Messmate (*Eucalyptus obliqua,* L'Herit).

The Red Stringybark (*Eucalyptus macrorrhyncha*).

Fig. 31.

The common Stringybark tree of Victoria, widely distributed over the State, found generally on comparatively sterile ridges and ranges. It does not attain the height of Messmate (*E. obliqua*), nor does it ascend generally to the high elevations at which the latter is found. Both trees, however, frequently occur intermingled; it generally grows in the company of Red Box, Grey Box, Yellow Box, and Long-leaf Box in the drier districts, and with Manna Gum and Narrow-leaf Peppermint (*E. Australiana*) in other situations.

The wood is hard, mostly of a deep reddish brown coloration, but also occurring pale in colour; it is usually durable, free in grain, and therefore suitable for palings, shingles, and fence rails; it is also sawn into commercial timber, and furnishes a fair fuel. The bark is thick, fibrous, and tough, from light to dark-grey in colour on the outside, reddish-brown inside; the inner layers are so tough as to be available for rough cordage.

The leaves are scattered on the branchlets, lance-shaped, equally green on both sides, the veins moderately spreading, the marginal one distinctly removed from the edge. The umbels or clusters of from four to nine flowers occur mostly singly; the buds sharply pointed, tapering sharply towards the point as well as the stalk; the fruit is round, three and less frequently four celled.

Like the other Stringybarks, it is not a very reliable tree as a honey-producer, but yields better in Gippsland and moist localities generally than in the drier parts of the State. The honey is clear, but rather high-coloured, but of good flavour, and when thoroughly ripe, of fair density; it candies rather readily, but not solidly, and should always be heated to 160 deg. Fahr. before being marketed, otherwise a froth will form on top of the honey after it has been standing for some time. Pollen is gathered from the blossom; the normal flowering time is February, and the buds appear from fifteen to eighteen months previously.

The Red Stringybark is more subject to periodical ravages by the caterpillar of the cup moth than any other Eucalypt. Square miles of forest are sometimes devastated by these pests, the value of the trees to the beekeeper being destroyed for several years. The trees themselves are much injured.

Fig. 31.—The Red Stringybark (*Eucalyptus macrorrhyncha*, F. v. M.).

The Brown Stringybark (*Eucalyptus capitellata*).

Fig. 32.

This tree attains a maximum height of 200 feet, but, as a rule, is not so tall. It is widely distributed over Victoria, appearing in the Eastern and moister half as a tall tree, but near the Grampians and the South Australian border in a dwarf state. It furnishes a good timber for all purposes for which Stringybark is used.

The umbels are in sprays at end of branchlets, hence the botanical name *capitellata* (head flowering), or single lateral, or at shoulders of leaves bearing from four to fifteen flowers, not of large size. The buds taper only slightly towards the stalk, while the top is rounded or blunt-pointed. The fruit is almost round with the points of the crown well projecting and of a dark-brown colour when the fruit is dry.

The bark in appearance resembles that of Messmate, but is harsher and more stringy, and reaches far up into the branches, the branchlets alone being smooth.

The leaves are lance-shaped, or lance slightly sickle-shaped, rather thick, dark green, usually more shining on the upper than the lower side; the lateral veins moderately spreading, the marginal vein distinctly removed from the edge.

The buds appear fifteen to eighteen months before flowering, which occurs two years in succession, in February and March, so that for some time there are two generations in sight. This is also a characteristic of the Red Stringybark (*E. macrorrhyncha*), Manna Gum (*E. viminalis*) and Long-leaf Box (*E. elæophora*). As a nectar-producing tree it is not very reliable, being like the Red Stringybark, somewhat irregular, failing altogether some years, particularly in dry districts. It is, however, very useful as a pollen bearer.

The honey is one of the darker ones, but fairly clear, of good density and pleasant flavour, and preferred to other honey by people used to it. When heated it throws off a considerable amount of froth, and as it is inclined to candy it should always be heated to 160 deg. Fahr. before it is drawn into tins for market, otherwise a layer of froth will be found on top of the honey some time after it is tinned.

The Brown Stringybark differs from the Red (*E. macrorrhyncha*) chiefly in the smaller flowers, blunter or less pointed, and somewhat angular buds of the first-named, while the projecting valve flaps of the ripe fruit which are common to both separate them from other Stringybark trees.

Fig. 32.—The Brown Stringybark (*Eucalyptus capitellata*, Sm.).

The White Stringybark (*Eucalyptus eugenioides*).

Fig. 33.

The White or Gippsland Stringybark is a tree with a straight stem attaining a height of about 200 feet, occurring mostly in elevated poor grounds, but also in sandy low lands from the Dandenong Ranges and their vicinity to hilly and mountainous places in Gippsland and to Two-fold Bay.

The wood is pale coloured, splits well into shingles, palings, rails, and slabs, and is also sawn into building timber; it is more lasting than that of the Red and the Brown Stringybark, but is inferior for fuel.

The bark is fibrous, very tough, reddish-brown inside, and is the best kind for rough roofing, and on this account thousands of straight valuable timber trees have been destroyed, one single sheet of bark being taken off the standing tree.

The leaves are scattered on the branchlets, broad lance or slightly sickle-shaped, dark-green and shining on both sides, the veins somewhat faint, the marginal vein somewhat removed from the edge. The flowers four to twenty in single umbels at shoulders of leaves, or sometimes in a small spray; buds conical, fruit cup-shaped, but without the projection of the valve flaps of the Red and Brown Stringybark ripe fruit.

The White Stringybark blossoms in Autumn and Winter. Nothing definite is yet known as to the length of time it is in bud, and how often it flowers. It yields great quantities of pollen to bees. The honey is like that of other Stringybarks, and has the same characteristics as to frothing, but is paler, being of clear amber colour, and good flavour.

Fig. 33.—The White Stringybark (*Eucalyptus eugenioides*, Sieb.).

The Yellow Stringybark (*Eucalyptus Muelleriana*).

Fig. 34.

The Yellow Stringybark, so-called because the bark is very yellow when freshly cut; the timber is also yellowish. The stem is straight, rather massive, with moderately spreading branches, and a fibrous dark-grey bark. The leaves of aged trees are lance-shaped, and more or less unequal sided, rather dark-green in colour, equally shining on both sides, and usually three to five times as long as broad. The seedlings have narrow lance-shaped opposed leaves. In young saplings the leaves are rather broad lance or egg lance-shaped. The stems of saplings and young trees are somewhat smoother than those of other Stringybarks.

The clusters of flowers appear usually solitary; the buds are from three to twelve in the umbels, tapering towards the stalk, the lid (top) half egg-shaped, or half-round, smooth, and occasionally slightly pointed. The fruit is almost half-round, four celled, less frequently three to five celled, indented with small pits, and usually gray-green in colour.

In Victoria the Yellow Stringybark has an extensive range in the southern part and eastern Gippsland. It is a valuable splitting timber, and exceedingly durable in contact with the ground.

As to its value as a nectar and pollen yielder, the character of the honey, time of flowering, no definite information is, so far, available, excepting that it is of little value to bee culture, and the writer hereby invites information on this subject from beekeepers able to give such in regard to this tree, or any other Eucalypt on which the information is incomplete.

Fig 34.—The Yellow Stringybark (*Eucalyptus Muelleriana*, Howitt).

The Yertchuk (*Eucalyptus Consideniana*, Maiden).

Fig. 35.

A medium-sized tree, with a grey tough bark of the character well known as "peppermint," very like that of the Peppermint Gum (*E. piperita*. Sm.), but very different from that of the Silver Top (*E. Sieberiana*. F. v. M.), in the company of which it often grows. In Gippsland it seems more of a Stringybark, with rough bark (as in other locations) right to the tips of the branches. It grows most freely upon the rather poor sandy and clay lands of the coastal country of Eastern Victoria, ascending also the coast ranges.

Yertchuk is the aboriginal name of this tree, which is also known as Peppermint, Messmate, and White Mahogany.

The leaves of mature trees are commonly broad lance-shaped, unevensided, and somewhat curved; up to 9 inches in length and nearly 2 inches in width; rather thick in texture. Colour equally green on both sides, dull or shiny, blue-green or bright sap-green. Veins of leaves strongly marked, spreading from the base, the marginal vein a considerable distance from the edge. Leaves mostly hanging straight down.

Juvenile leaves (sucker and seedling leaves) narrow lance-shaped, opposite but soon becoming alternate. They are narrower than those of the Silvertop (*E. Sieberiana*. F. v. M.), and of the Peppermint Gum (*E. piperita*. Sm.) to both of which the Yertchuk (*E. Consideniana*) is closely related and possibly a hybrid of these two species. The sucker leaves of the Yertchuk are of a rather strong peppermint odour and often of silvery appearance. The young branchlets and seedling stems are angular.

The flower clusters have numerous buds, with the typical form of the Narrow-leaved Peppermint (*E. Australiana*), to which also the shape of the bud and the depressed lid belong, which, however, in the Yertchuk is sometimes pointed.

The fruits are generally pear-shaped, often nearly conical, rather more than ¼-inch in diameter. The rim of the fruit broad, smooth, well defined, and usually red in colour; it is somewhat like that of the Scribbly Gum (*E. haemastoma*), but the latter is a gum, or smooth-barked species.

This species can be most conveniently distinguished by its pear-shaped fruits and peppermint bark, its narrow sucker leaves are also characteristic.

The timber is pale-coloured, with gum rings, remarkably like that of the Peppermint Gum (*E. piperita*. Sm.). It is soft and stringy, not nearly so good as that of the Silvertop (*E. Sieberiana*, F. v. M.).

Nothing is yet known of the value of the Yertchuk to the apiarist.

Fig. 35.—The Yertchuk (*Eucalyptus Consideniana*, Maiden).

The Mealy Stringybark (*Eucalyptus cinerea*, F.v.M.).

Fig. 36. Upper part of plate.

A moderate-sized tree, flowering already in the shrubby state, the trunk is comparatively short, with branches at from 10 to 15 feet from the ground even in aged trees; the wood is twisted and brittle, and of inferior value, the bark fibrous but not distinctly stringy, light-brown to grey outside and light-brown with a reddish tinge inside; usually only the upper branches are smooth.

The foliage has a variable whitish or ashy bloom. The leaves either stalkless and opposite, and heart to egg-shaped, as seen in the illustration Fig. 36, 1A, 1B, 5, and 6, or broad lance and even narrow-lance shaped on short stalks, as shown at 3 and 4, or of an intermediate shape as at 6, while sucker and seedling leaves are almost round (2). The lance-shaped leaves are found more on aged trees, and become even alternate or scattered instead of opposite, but broad and lance-shaped leaves are often found on the same tree; the veins of the leaves are very spreading, not conspicuous, the marginal veins remote from the edge.

The flowers are at the shoulders of leaves in threes, only exceptionally at the end of branchlets, which latter are thin and round. The buds are half round, pointed or conical to broad conical; the fruits small, half round top-shaped, three to four, rarely five celled. This tree flowers from October to December, and although it does not perhaps rank high as a nectar producer, it is like some others, enumerated to enable the reader to distinguish it from others of greater apicultural or timber value.

The Mealy Stringybark is found in Victoria, in the North-Eastern district, where it is known as turpentine tree, on account of a somewhat terebinthine odour of the bark, or as silver-leaved stringybark; this name has now, however, been adopted for a variety slightly different and growing in the south-eastern parts of the State.

The Silver Stringybark (*Eucalyptus cinerea*. Var. *multiflora*).

Fig. 36. Lower part of plate.

A tree usually of medium size, but it may attain a height of about 100 feet, bark softly fibrous, greyish to brown outside, reddish-brown inside, and on old, stunted trees in swampy ground of great thickness in comparison with the size of the tree. Timber reddish, inferior in quality, soft short grained, and often hollow when growing on low ground.

The leaves of suckers and young saplings are broad egg-shaped (7, lower part of Fig. 36), or heart-shaped, stalkless and opposite, changing in older trees to longer and narrower short-stalked opposite (8A), or narrow lance-shaped scattered leaves (8B), but all kinds are quite commonly found on the same adult tree. Young foliage, as also buds and branchlets, frequently covered with a white or bluish bloom, giving the tree a silvery appearance, hence the local name "Silver Stringybark."

Flowers in umbels of four to eight at shoulders of leaves; the buds conical pointed; fruits small, half round to top shaped.

This tree appears to be confined to the eastern half of Victoria, and particularly the south-east; from the vicinity of Melbourne to Omeo and Buchan it is found in many places in districts with a good rainfall,

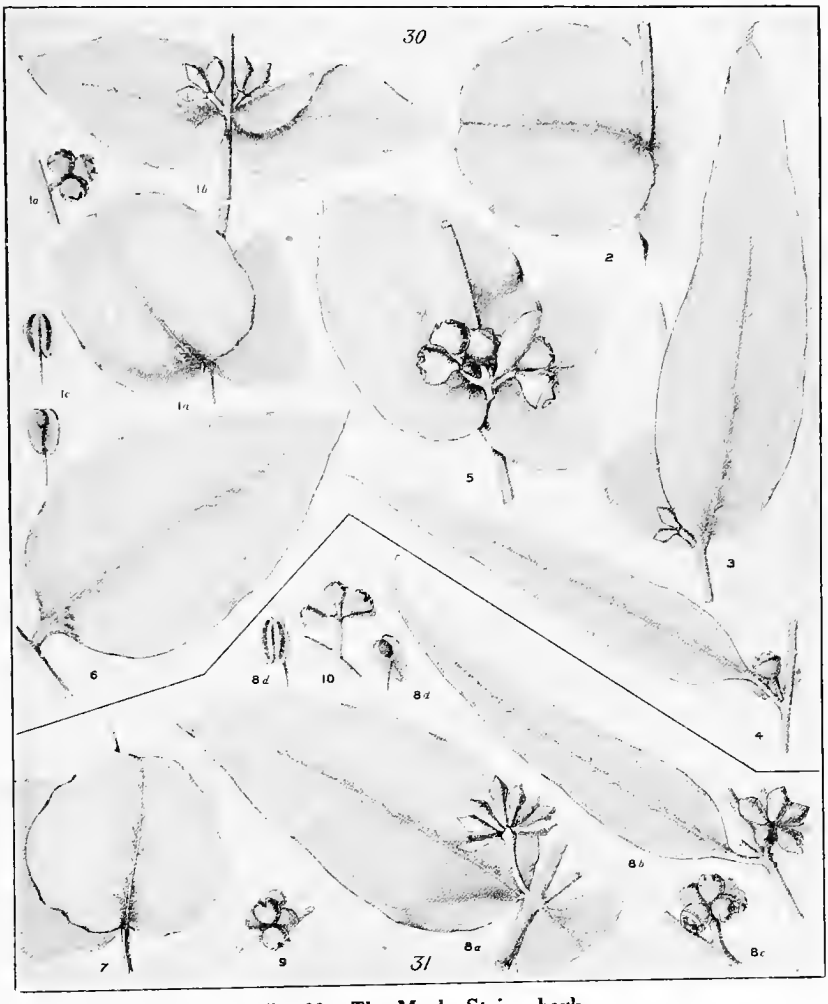


Fig. 36.—The Mealy Stringybark

(*Eucalyptus cinerea*, F. v. M.) Upper part of Plate 1-6.

Fig. 36.—The Silver Stringybark

(*Eucalyptus cinerea*. Var. *multiflora*, Maiden). Lower part of Plate 7-10.

generally on poor soil on low sandy heath country, or on bayonet-grass flats, but also on low hills, near or intermingled with Messmate (*E. obliqua*) and narrow-leaved peppermint. As a timber tree it is

almost worthless; even for fuel purposes it is inferior; but to the bee-keeper in the localities where it grows it is a valuable tree, furnishing an autumn supply of nectar and pollen, which enables the bees not only to accumulate winter stores, but often also to store surplus and always to keep up brood rearing till quite late in the season. In this respect it takes in the eastern part of the State the place of the long-leaved box (*E. elæophora*), which is so highly appreciated by the apiarists of the drier districts, on account of the successful wintering of the bees always connected with its flowering.

The Silver Stringybark, which is also known by several other names, such as apple tree and red stringybark, flowers every second year from March to May or June, and is freely visited by bees even so late in the season when frosts occur at night. The honey granulates or candies somewhat coarsely, but never very hard, and although it is one of the darker kinds, it is yet one of the best flavoured of the localities producing it.

The Red Mountain Ash (*Eucalyptus gigantea*. Syn. *E. Delegatensis*).

Fig. 37.

A very tall tree occurring on the top of mountain ranges. The bark is stringy and reddish extending well up the trunk. The leaves are comparatively large, often 9 inches long and 2 broad, pointed lance-shaped, with the veins prominent, the marginal vein removed from the edge. Sucker leaves broad, lance-shaped unevensided with prominent veins.

Flowers six to ten in a cluster on a stalk about 6 inches long at shoulders of leaves; buds with short tube and half-round blunt lid. Fruit pear-shaped with thick rim.

Judged by specimens of leaves and buds this tree is difficult to differentiate from the Silvertop (*E. Sieberiana*), sucker leaves also are very similar, but bark and timber of the two are quite different.

Found in Victoria on mountain ranges in the eastern part, generally not below an elevation of 3,000 feet. The wood is reddish when fresh but dries pale; it is tough and springy, and used for cabinet and three-ply work.

Nothing is so far known as to its value as a source of nectar and pollen.

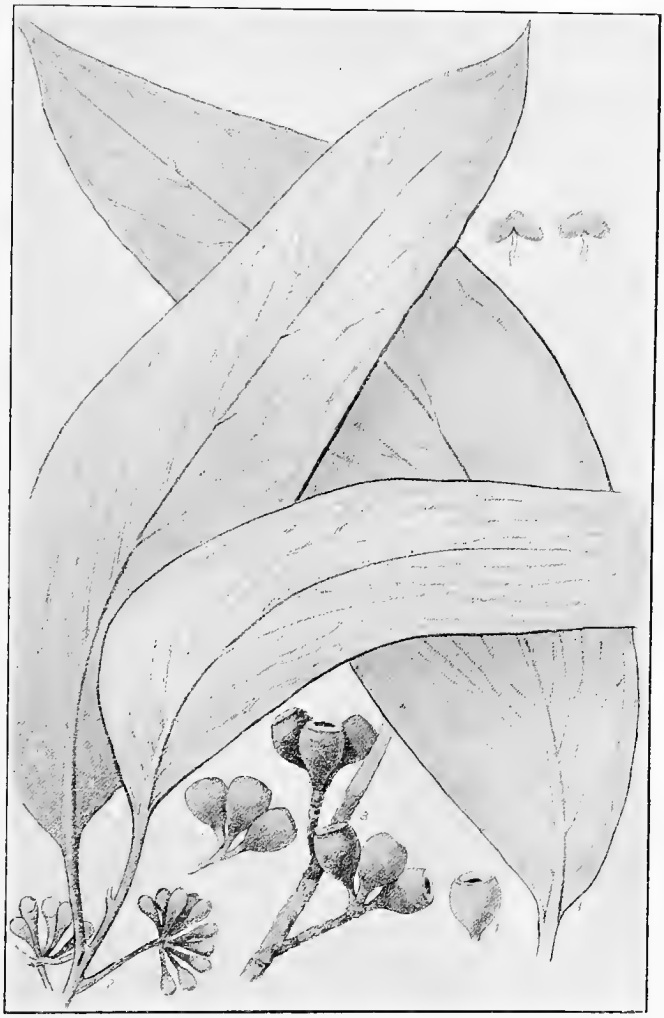


Fig. 37.—The Red Mountain Ash (*E. gigantea.* Syn. *E. Delegatensis*, R. T. Baker).
[From Proceedings, Linnean Society, N.S.W., 1900.]

The Grampians Gum (*Eucalyptus alpina*, Lindley).

Fig. 38.

A dwarf eucalypt of no economic value, and remarkable for being confined to a restricted area in the Grampians, where it is found at an elevation of over 3,000 feet.

It was discovered by Colonel Sir Thomas Mitchell, when that eminent explorer discovered the Grampians, and ascended, in July, 1836, the mountain now known as Mount William.

It is probably the slowest growing of our eucalypts, which is quite remarkable, because its nearest systematic relative is the Blue Gum (*E. globulus*), our fastest growing tree, which it much resembles in its warty buds and fruits.

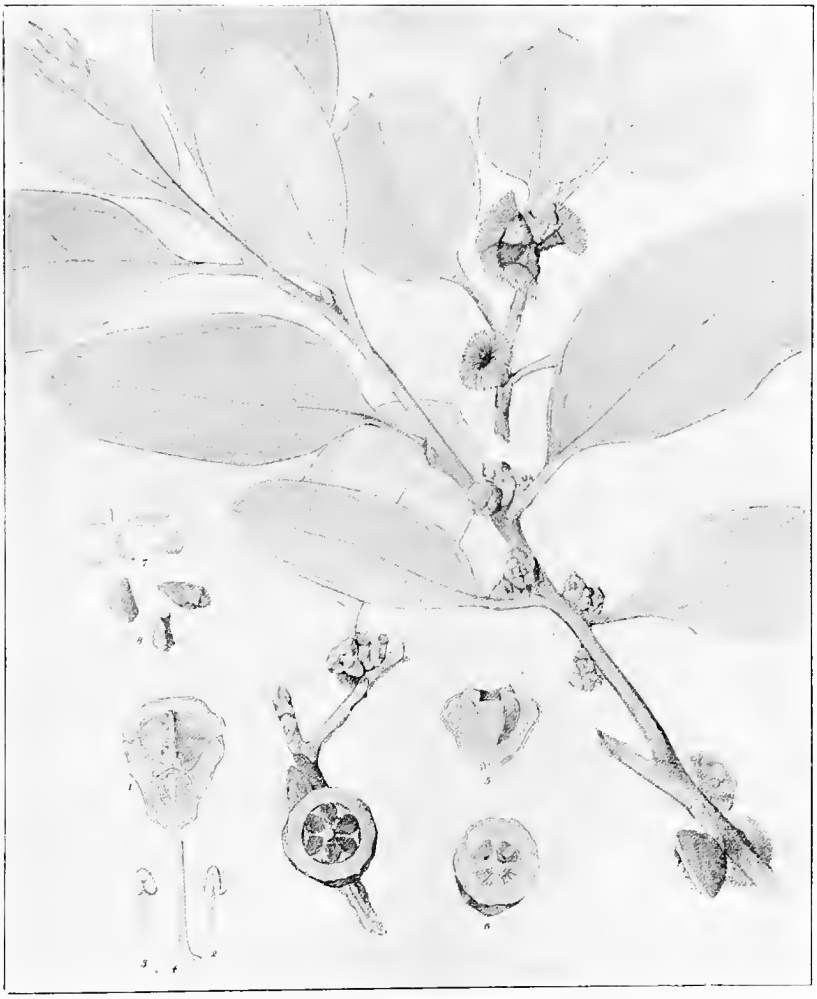


Fig. 38.—The Grampians Gum (*Eucalyptus alpina*, Lindley).

IV. Ironbark Group.

The Red Ironbark (*Eucalyptus sideroxylon*).

Fig. 39.

The Red Ironbark, also known as Rough and Black Ironbark, grows chiefly on ironstone ridges and gravelly rises. It is not a very tall tree, except in East Gippsland, but sometimes attains to 5 feet in diameter at the base, usually upright in habit, but drooping in the outer branches of old trees, the large handsome flowers resembling fuchsias from a distance. The bark, which varies from dark-grey and brown to black, is deeply furrowed on old trees, very hard, and of great thickness. Leaves, flowers, buds, and fruits are almost identical with those of the Yellow Gum, but are usually somewhat larger. The flowers are white, occasionally pink. In most localities it blossoms between June and September. In the Inglewood and Tarnagulla districts, however, it appears to flower in February. It is in bud from five to six months. No pollen is gathered from the blossom. The honey is of fine quality, and candies with a fine grain much like that of Yellow Gum, great yields of it are harvested when the tree flowers during suitable weather and occurs in great numbers together.

The wood, which is red in colour, tough, hard, and strong, is one of the most durable and valuable of the hard woods. It is largely used for railway sleepers, telegraph poles, piles, waggon work, &c. While in leaf, flower and fruit, the Red Ironbark closely resembles the Yellow Gum till recently known as White Ironbark; it differs from it considerably in general appearance, the bark, and the colour of the wood. In the seedling and sucker leaves the two are quite distinct, as will be seen on reference to the illustration (Fig. 39). B and C represent seedling and sucker of the Red Ironbark, and G, H, and K the same of the Yellow Gum.

Fig. 39.—The Red Ironbark (*Eucalyptus sideroxylon*, A. Cunn.).

The Grey Ironbark (*Eucalyptus paniculata*, Sm.).

Fig. 40.

A tree of medium size, usually 60 to 70 feet in height, with a diameter of 2 to 4 feet; exceptionally it attains a greater size. It is found chiefly in New South Wales, but extends into Eastern Victoria, occurring at Mount Taylor.

It is known by different local names such as Grey Ironbark, White Ironbark, on account of the paleness of the timber as compared with the Red Ironbark (*Eucalyptus sideroxylon*), also as Ironbark and Red Ironbark, in reference to the pale-red colour of the wood.

The leaves are scattered, of rather thin consistence, narrow lance-shaped, long lance or sometimes broad-lance shaped, slightly curved, paler and dull coloured beneath, hardly shining on the upper surface. The lateral veins of the leaves are very spreading, faint and numerous, the marginal vein close to the edge of the leaf.

The flowers occur in tufts or panicles, hence the specific name "paniculata." A few of the flowers, however, also appear at the shoulders of leaves and in single clusters of from three to eight flowers on slender angular stalks. The buds are egg-shaped, tapering into the stalk, the calyx (flower cup) generally longer than the half-round, more or less pointed lid. The fruits, which are sometimes much smaller than the normal type, are somewhat pear-shaped, slightly contracted at the summit, three to four, or rarely five-celled, with two to four angular streaks.

The bark is of the hard rugged kind as indicated by the popular name; it is often pale-coloured, even grey, while that of the Red Ironbark (*Eucalyptus sideroxylon*) is almost black.

The timber, which is pale pink when freshly cut, becomes darker with age, is not excelled by any other timber for combined strength and durability.

The Grey Ironbark is not easily confused with any other Victorian species, as only two others, the Red Ironbark (*E. sideroxylon*) and the Silver Top (*E. Sieberiana*) have the characteristic bark. The Red Ironbark has a deep red wood and a black bark as distinguished from the pale pink wood and paler or greyish bark of the Grey Ironbark. Both these species grow on ironstone ridges and dry, poor land, while the Silver Top (*E. Sieberiana*) inhabits moister situations.

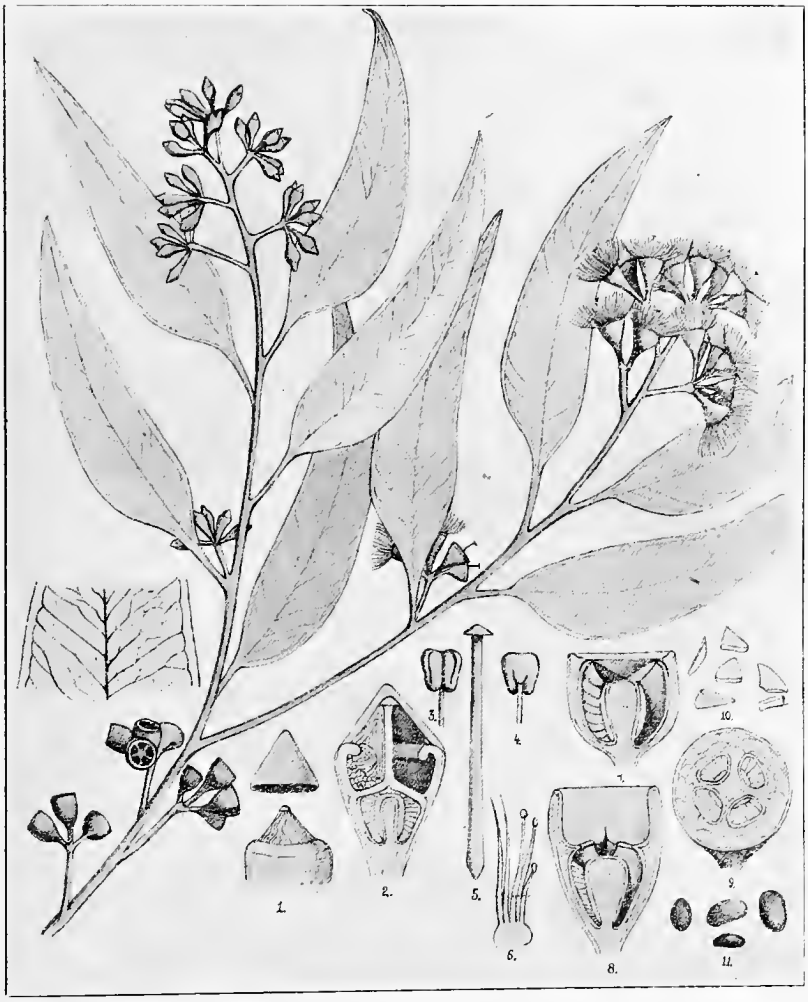


Fig. 40.—The Grey Ironbark (*Eucalyptus paniculata*, Smith).

The Silvertop (*Eucalyptus Sieberiana*, F. v. M.).

Fig. 41.

This tree is variously known as Mountain Ash, Ironbark, and Silvertop Ironbark. It is tall with a dark fibrous bark. The leaves of mature trees are lance-shaped, slightly curved, with the marginal vein removed from the edge and the veins fairly prominent. The sucker leaves are oblique, egg-shaped, and about 3 inches long, or lance-shaped curved, and up to over 6 inches long. The buds are club-shaped, numerous in an umbel, the fruit pear shaped.

The timber is light in colour, not hard, usually straight, and free in grain, easily worked, and extensively used for railway sleepers, palings, shingles, spokes, and recommended for shafts, &c.

The Silvertop is found, usually on high ground, particularly sandstone ridges, on the Upper Yarra and Gippsland. It flowers more or less every year in August, September, and October. It yields pollen and amber-coloured honey which candies and is not of the first grade.

Fig. 41.—The Silvertop (*Eucalyptus Sieberiana*, F. v. M.).

V. Wrinkled Bark Group.

THE MAHOGANY GUM (*Eucalyptus botryoides*, Smith).

Fig. 42.

The Mahogany Gum, Bastard Mahogany or Bangalay, when growing on elevated ground is a fine upright tree with a straight trunk of large dimensions, and is of very rapid growth. On low ground and banks of creeks it is usually gnarled. The bark is red coloured, short grained, flaky, and brittle. The timber is hard, close grained, red coloured, and very durable, used for felloes of wheels, ship building, &c.

The leaves are broad lance-shaped, about 6 inches long, shining on the upper surface; the veins well marked, fine, and numerous, almost at right angles to the mid-rib with marginal vein very near the edge. The buds and fruits are compact, elongated, and characteristic of the species.

In Victoria it is found in East Gippsland. As a nectar or pollen producer it does not rank high, its flowering time is uncertain, nor is the honey first grade, but it yields pollen to bees.

On account of its beautiful dark foliage and compact habit of growth it is coming into favour for planting in streets, parks, and as a break-wind.

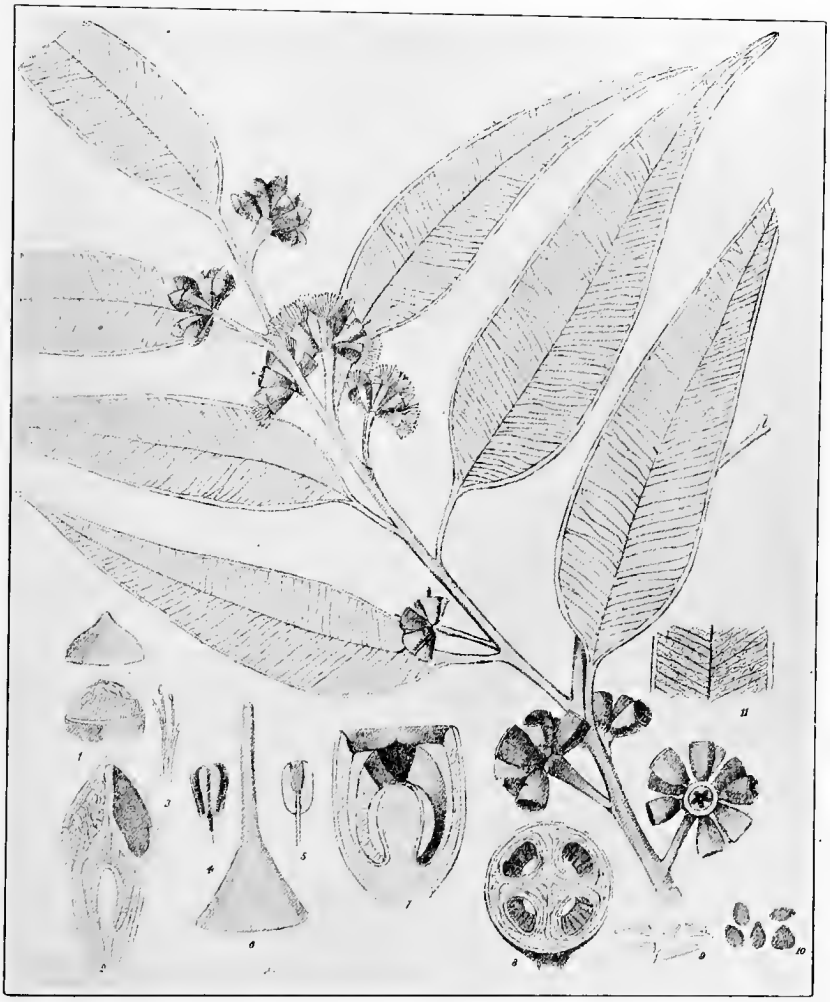


Fig. 42.—The Mahogany Gum (*Eucalyptus botryoides*, Smith).

The Blood Wood (*Eucalyptus corymbosa*, Smith).

Fig. 43.

The Blood Wood is a tree not easily confounded with other species. It attains a maximum height of 150 feet, but is often of much lower and sometimes stunted growth, flowering already when scarcely beyond its early shrubby stage.

The bark is persistent furrowed, of a reddish colour, inside fibrous, but rather flaky than stringy, outside rough, grey, and turning black. Bark of the upper branches smooth, and often reddish. The tree exudes kino (gum) abundantly, the whole stem being sometimes covered with this reddish blood-like substance, and hence its popular name.

The timber has a deep red fleshy colour, is porous, and has numerous gum veins; it is easy enough worked when fresh, but becomes very hard when dry. It lasts well underground, and is resistant to termites (white ants), and teredo (sea worm). It is used in fencing and for piles and railway sleepers.

The leaves are scattered on slightly angular branchlets. The leaves vary in size up to 9 inches long and 2 inches broad, of firm consistence, lance-shaped, somewhat curved, or slightly sickle-shaped, paler on the under side, veins very numerous, and very fine, only slightly oblique, the marginal vein close to the edge of the leaf.

The flower clusters occur in sprays forming a nearly flat top, rarely singly at leaf-shoulders, or lateral on branchlets on slender, slightly compressed or angular stalks, bearing three to nine rather large flowers. Buds nearly 1 inch long with flower cup tapering into the stalklet, and a half-round, short, pointed lid. Fruit about 1 inch long more or less urn-shaped, not angular, three or oftener four celled.

The Blood Wood is found in Victoria only in the far eastern part, in the vicinity of the Genoa River.

No Victorian data are available as to its honey-producing value, owing to it not occurring in any present bee-keeping localities. It is, however, considered of some importance by New South Wales apiarists.

Fig. 43.—The Blood Wood (*Eucalyptus corymbosa*, Smith).

The Blackbutt (*Eucalyptus pilularis*).

Fig. 44.

A tree attaining under favorable conditions a height of 300 feet, but as a rule of much less height. Its home is in New South Wales.

The timber is excellent for general purposes, used largely for building, furnishing material for flooring boards and superior shingles; also utilised for telegraph poles and railway sleepers.

The rough bark which covers the lower part of the trunk, but sometimes continues to the branches, is blackish grey outside, somewhat fibrous and brownish inside. The bark of the branches and sometimes of the upper portion of the stem is smooth and grey, or whitish in colour.

The leaves, which are scattered on the distinctly angular branchlets, are narrow, or sickle lance shaped, rather more shining on the upper than on the lower side; the veins are numerous, but very faint.

The clusters of flowers occur mostly singly from the shoulders of leaves on a strongly compressed stalk, bearing from four to sixteen flowers. The stalklets of buds are rather thick and angular, the lids of the buds conical, distinctly pointed; the fruit is half-egg or almost cup-shaped, three or four, but rarely five celled.

The Blackbutt is one of a number of eucalypts of which, from an apicultural point of view, practically nothing authentic is known. The regrettable dearth of information as to nectar production, frequency and time of flowering and length of time in bud which still exists in regard to several eucalypts growing in the moister parts of the State, is in the first instance due to the absence of interested observers, specialist bee-keepers having so far not invaded this class of country, and secondly to the difficulty of ascertaining the sources of nectar and pollen gathered by the bees in localities where the timber is tall, largely intermingled, and several varieties flower at the same time.

It is doubtful whether more than isolated specimens of this species occur in Victoria, but the name Blackbutt is applied to several other Eucalypts in some districts.

Fig. 44.—The Blackbutt (*Eucalyptus pilularis*, Smith).

The Woolly Butt (*Eucalyptus longifolia*, Link).

Fig. 45.

The Woolly Butt is a tall tree with a grey fibrous bark extending to the upper branches, which are smooth. The durable and very valuable timber varies from a light colour to dark red in colour, hard, and cross grained. The leaves are lance-shaped, often 12 inches in length, hence the botanical name, not shining, the veins well marked with the marginal vein rather close to the edge. Buds, flowers, and fruits comparatively large, occur mostly in threes on rather long stalks and stalklets.

This is a beautiful foliaged tree growing on the eastern extremity of Gippsland, extending into Victoria from New South Wales. It is a valuable timber for sleepers, piles, &c., wherever there is contact with the ground.

The Woolly Butt flowers in January, February, and March, yielding pollen to bees and an amber-coloured honey.

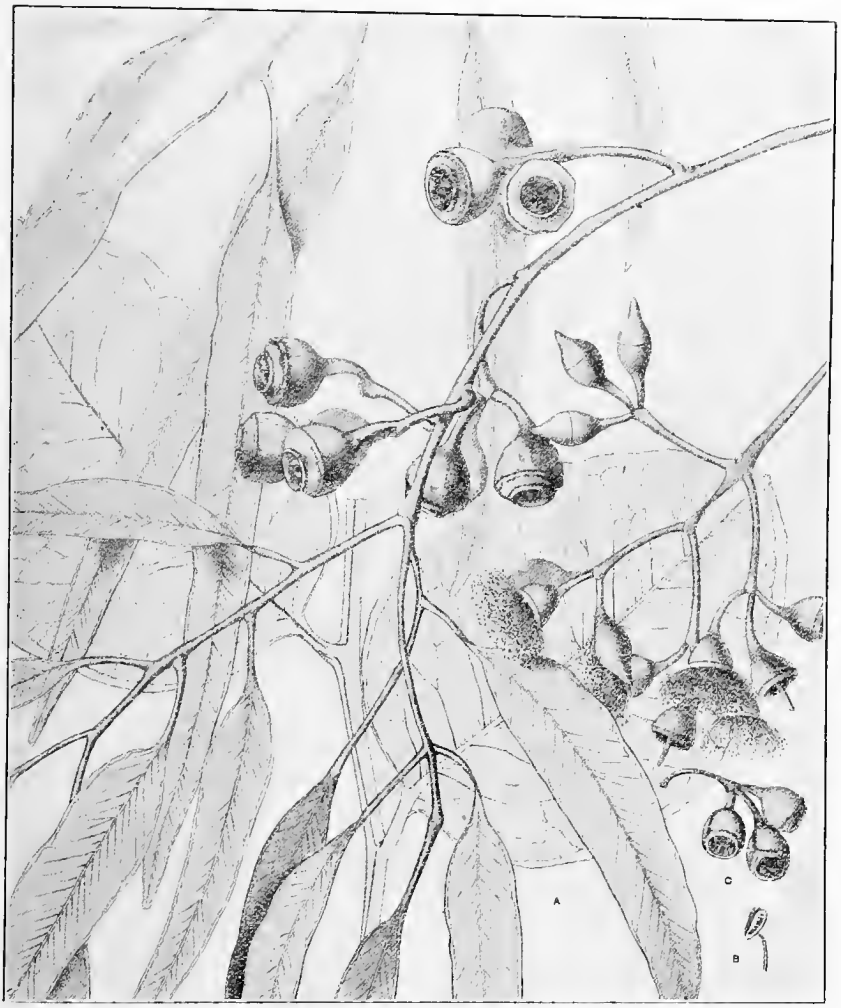


Fig. 45.—The Woolly Butt (*Eucalyptus longifolia*, Link).

VI. Peppermint Group.

THE GIANT GUM OR WHITE MOUNTAIN ASH (*Eucalyptus regnans*).

Figs. 46 and 12.

This tree is closely allied to the Narrow-leaved Peppermint (*Eucalyptus Australiana*, syn. *amygdalina*), it is known as Blackbutt, Mountain Ash, and even White Gum. In Victoria it occurs over a wide area in South and Western Gippsland together with Messmate (*E. obliqua*), and Blue Gum (*E. globulus*).

It is the largest tree in Australia, trees over 300 feet high being known in Victoria. It was formerly held to be of much greater height, as much as over 400 feet; authoritative measurements have, however, since reduced it to somewhat over 300 feet.

The following description is extracted and the illustration (Fig. 46) taken from Mr. J. H. Maiden's *Forest Flora of New South Wales.*

The mature leaves are lance-shaped to broad lance-shaped, shining on both sides, usually thin in texture (but sometimes quite leather-like), veins slightly spreading, oil dots extremely numerous. A common method of recognising *E. regnans* is to hold up a leaf to the light and to notice the fine oil dots which cover its surface, but this characteristic is possessed by the leaves of a few other species.

The juvenile leaves of young seedlings are broad-lance-shaped, and opposite, but soon become scattered on the stem and broad lance-shaped, unequal-sided, pointed very like those of Messmate (*E. obliqua*) saplings. The buds are rounded to pointed conical in clusters occurring singly or in pairs. The fruits are variable in size and shape, the stalk of the cluster is often an inch long.

The bark is more or less fibrous in the under layers on the butt of the trunk. On the giant trees there is very often little of this bark, the upper portion resembling a White Gum. On other trees of the same species the fibrous bark runs further up the trunk, and thus it follows that the same species may locally be called either a White Gum or a Blackbutt.

The timber is pale coloured, very fissile (free in grain) and therefore well adapted for palings, shingles, and fence rails; it is also extensively used for saw-mill purposes.

As to the value of the Giant Gum for bee-keeping purposes, nothing is known, as it occurs in districts where commercial bee-keeping is not yet carried on, and therefore no observations have been made as to the amount and character of the honey, and whether it furnishes pollen for bees; but it is probable that in this respect it resembles the closely-allied species Narrow-leaved Peppermint and Broad-leaf Peppermint.

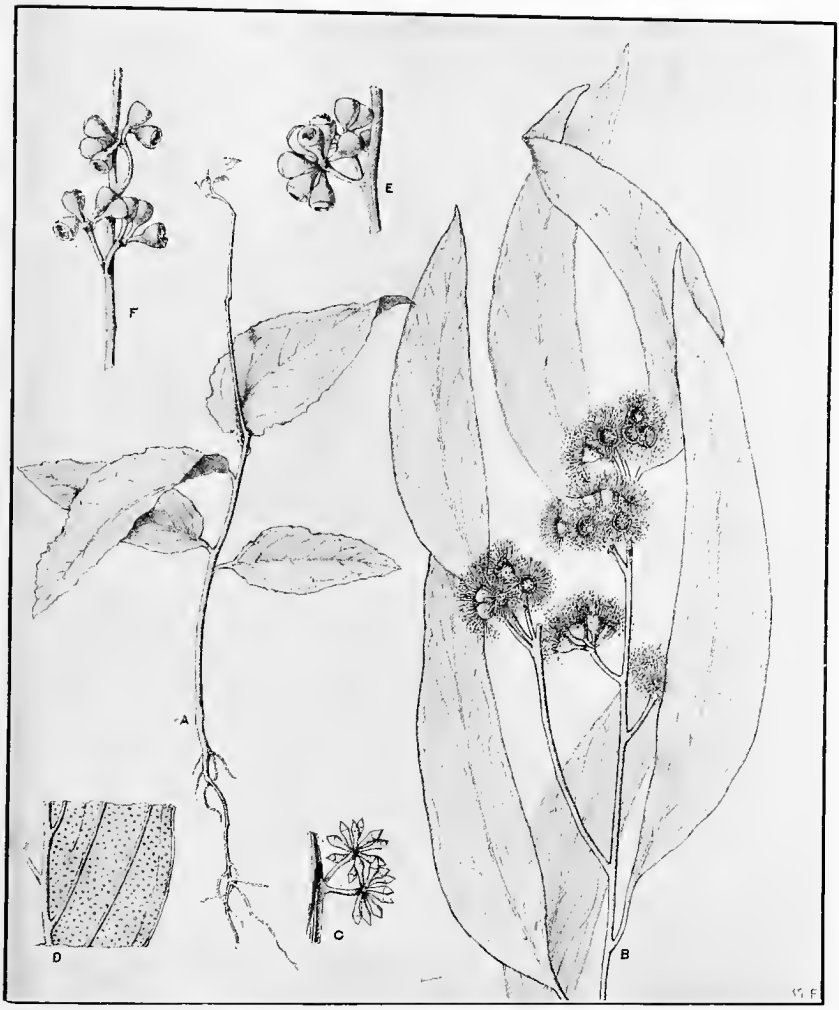


Fig. 46.—The Giant Gum or White Mountain Ash (*Eucalyptus regnans*, F. v. M.).

The Common or Narrow-Leaf Peppermint (*Eucalyptus Australiana*. Baker. Syn. *E. amygdalina*).

Fig. 47.

The peppermint eucalypt of Victoria, New South Wales, and Tasmania, occurring in Victoria on the poorer soils, in the cooler districts. In some localities it is known as "Messmate," from which, however, it is very easily distinguished and in the company of which it often grows. This is the tree from the leaves of which most of the commercial eucalyptus oil was first distilled but many other species are now being utilized.

A tree usually small or moderate-sized, but sometimes attaining considerable height, the bark is fibrous on the trunk and larger branches, but usually smooth higher up. It is grey or brownish-grey in colour, and not so fibrous as that of stringybark.

The leaves are narrow, long lance-shaped, sharply pointed, rather thin; the veins are few and oblique, not prominent; usually the foliage is dense and drooping; the buds are short-pointed, generally very numerous in the umbels; the fruit small, with a flat or slightly concave rim.

The peppermints, of which there are several, are readily distinguished from other eucalypts by the strong peppermint odour of the leaves when bruised.

The wood is pale-coloured (nearly white) when newly cut, but dries to a pale brown, it often contains gum veins, is of inferior durability, but occasionally used for fence posts and shingles, and makes fair fuel.

The narrow-leaf peppermint blossoms from October to December, in some districts January. February, practically every year, and rather profusely, but it does not appear to be of much value to the beekeeper. In the writer's experience of twelve years' beekeeping in peppermint country it never yielded enough nectar or pollen to be noticeable in the hives, and the yields of peppermint honey sometimes reported were probably obtained from other eucalypts called peppermint in that locality.

In the Beechworth district, however, it sometimes yields well. The honey is not first class, and candies quickly and very hard.

A tree found in Tasmania was first described and named *Eucalyptus amygdalina*, and the mainland tree now known as Peppermint was held to be the same. Following upon later researches establishing two distinct species the botanical designation *E. Australiana* was adopted for the tree on the mainland, and *E. amygdalina* for the Tasmanian species.

Fig. 47.—The Common or Narrow-leaf Peppermint (*Eucalyptus Australiana.* Syn. *amygdalina,* Labl.).

The Broad-leaf or Blue Peppermint (*Eucalyptus dives*).

Fig. 48.

A tree of medium size, but often flowering as a tall shrub, occurring in Victoria chiefly in the North-Eastern portion, and in a dwarfed state on part of the outer fringe of the Grampians. It closely resembles the Common or Narrow-leaf Peppermint, together with which it grows in some localities. The leaves are generally broader than those of the latter; the chief distinguishing feature, however, is the sucker leaves, which are quite narrow in one and broad in the other, as will be seen on reference to the illustrations (Figs. 47 and 48). Generally speaking, the Broad-leaf is more aromatic than the Narrow-leaf Peppermint, the odour different, though difficult to describe, and the fruits are usually larger.

The leaves are broadly lance-shaped, nearly symmetrical, and usually rather thick, the veins spreading and conspicuous. The buds usually blunt, but not distinctly rounded. It is a profusely-flowering species, with clusters of eight to twelve and even more flowers. The fruits are sometimes nearly half-round, or more or less inclined to pear shape.

The timber is pale-coloured, full of gum veins, and almost useless excepting for fuel.

This tree is known also as Peppermint, Blue Peppermint, and in the North-East of this State as Messmate.

As a honey-yielding tree it does not rank very high; like the Narrow-leaf Peppermint, it is so far reported as nectar producing only from the North-Eastern District, secreting only at intervals of years.

The honey is somewhat paler than that of the Narrow-leaf Peppermint, which, however, may be due to admixtures of honey from other sources. It candies quickly. No information is available as to whether it yields pollen for bees.

Fig. 48.—The Broad-leaf or Blue Peppermint (*Eucalyptus dives*, Schauer).

THE SYDNEY PEPPERMINT OR PEPPERMINT GUM (*Eucalyptus piperita*, Smith).

Fig. 49.

A tall tree, with a trunk up to 4 feet in diameter. Stem and branches covered with fibrous bark, rough and grey outside. The branchlets are slender; the leaves scattered, sickle-lance-shaped, not very long, more shining on the upper than the lower side, dark green, and usually thin; their lateral veins faint and numerous; the marginal vein somewhat removed from the edge. The clusters of from five to fifteen, rarely three to four flowers, occur at the shoulders of leaves, or mostly lateral on the branchlets, on slender, slightly compressed stalks; buds on short stalklets; lower part of bud half egg-shaped, top broad, conical, pointed; fruits usually small, globular, egg-shaped, three- or, much oftener, four-celled; fruits occasionally larger and less roundish than those shown in the illustration. (Fig. 49).

This tree is closely allied to the Blackbutt (*E. pilularis*), the White Stringybark (*E. eugenioides*), and to the Messmate (*E. obliqua*), as well as the Scribbly Gum (*E. haemastoma*); and these different species are sometimes not readily distinguished from one another. The Sydney Peppermint differs from the Blackbutt (*E. pilularis*) chiefly in its rough bark extending to the branches (which in the Blackbutt are smooth), in more slender and less angular branchlets, and smaller flowers.

From the White Stringybark (*E. eugenioides*), which was considered by Bentham to be a variety of the former, it is not easily distinguished, but its seedlings are smooth, while those of *E. eugenioides* are hairy (as shown in the background of the illustration). (Fig. 49.) The Messmate (*E. obliqua*) is distinguishable from the Sydney Peppermint (*E. piperita*) by the larger and thicker leaves of the former, which are of equal colour and shining on both sides, by the shorter and rounded blunt lid of the bud, and its longer conical lower part, or tube.

The distinguishing features of each species will become apparent on reference to the respective illustrations (viz., Figs. 49, 44, 30, 33 and 28).

The Sydney Peppermint is found on less fertile areas, from the coast to the mountain region, occurring even on sand lands in Gippsland and New South Wales.

The timber is useful for posts and shingles, but inferior to that of the allied species previously referred to.

Of its value as a nectar-producing tree nothing can be said till its identity is established in districts from which information is available, but which may refer to one or other of the allied species.

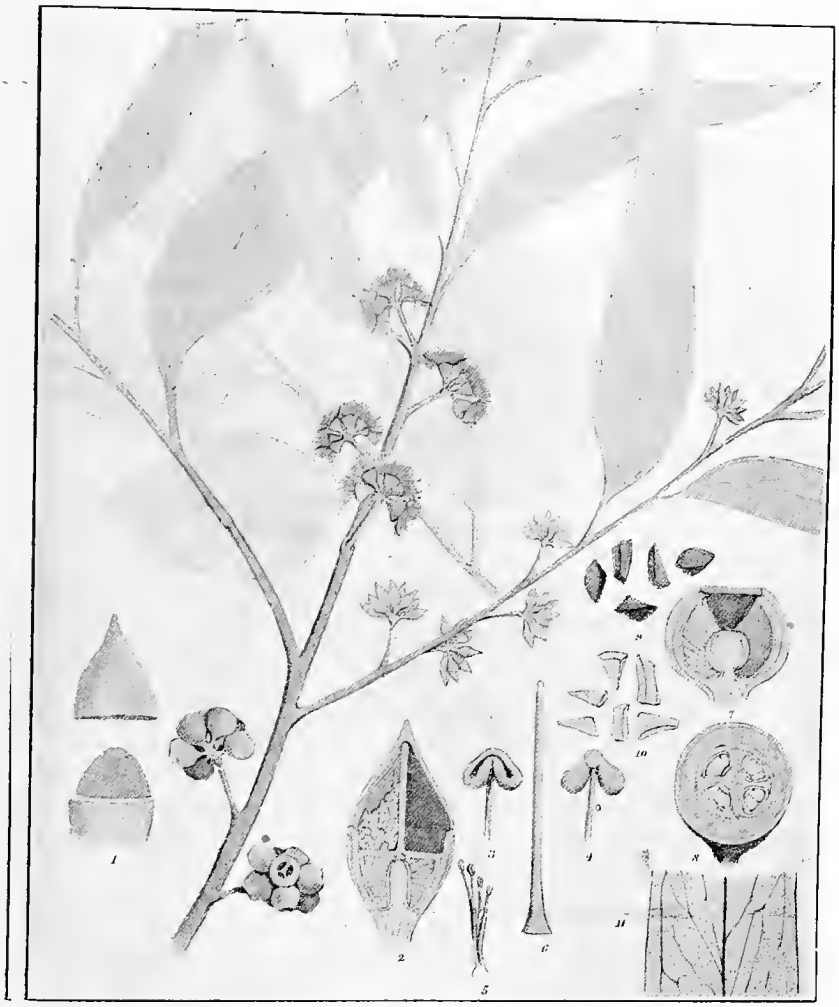


Fig. 49.—The Sydney Peppermint (*Eucalyptus piperita*, Smith).

THE WHITETOP GUM (*Eucalyptus vitrea*, R. T. Baker).

Fig. 50.

A tall tree with roughish bark similar to that of the Narrow-leaf (Common) Peppermint (*E. Australiana*), the extremities of the branches being smooth. In the adult foliage the leaves are narrow, lance-shaped, about 6 inches long, of dull green, shining on both sides, stalk short, few veins and almost parallel to the midrib. The sucker leaves are alternate or opposite on a short stalk or stalkless, egg-lance-shaped pointed, under 6 inches long, and 1½ inches broad; the lateral veins diverge from below the middle of the midrib, and are prominent on both sides, with the marginal vein removed from the edge of the leaf.

The flower clusters are at the shoulders of leaves, and bear generally from five to eight flowers; buds with lid half-round, short pointed; fruit half-round.

The timber is moderately hard and close grained, full of shakes and gum veins and apparently of little value. This tree is also known as Silvertop Messmate, Peppermint, and Messmate. The term Silvertop refers to the silvery appearance of the tree in the sunlight, due to the reflection of the light from the surface of the shiny leaves causing them to appear silvery. The term White Top is no doubt used to distinguish it from the Peppermint (*E. Australiana*), often known as Messmate. In Victoria the Whitetop Gum is found in the eastern parts of the State.

The Whitetop Gum is one of the Peppermint group of Eucalypts, it flowers in November, December, and January. The honey is dark amber and the tree also yields pollen for bees.

Fig. 50.—The Whitetop Gum (*Eucalyptus vitrea*, R. T. Baker).

The River White Gum (*Eucalyptus radiata*, Sieb.).

Fig. 51.

A fairly tall tree, with a hard, black bark on the lower portion of the trunk, but smooth on the upper part of the tree. The sucker leaves are thin and stalkless or almost stem-surrounding resembling those of the Narrow-leaf Peppermint (*E. Australiana*); they are opposite, narrow, and about 3 to 4 inches long. The leaves of adult trees are lance-shaped, generally about 6 inches long on a stalk about 1 inch long.

The veins of the leaves are not prominent. the marginal one removed from the edge. The flowers are very numerous, there being up to thirty in a cluster, which occur at the shoulders of leaves; the flower-cup is top-shaped, tapering into a long thread-like stalk, the lid (top) of the bud is blunt. The fruit is numerous, small, pill-shaped on thread-like stalks, rim thin, contracted.

The timber is pale, easily split and worked, and appears suitable for building purposes. The leaves yield a useful oil.

This tree is found in Victoria along rivers and creeks, principally in the eastern part of the State.

Fig. 51.—The River White Gum (*Eucalyptus radiata*, Sieb.).

VII. Mallee Group.

The Bull Mallee (*Eucalyptus Behriana*).

Fig. 52.

A tall shrub or small and perhaps never a tall tree, which may be said to form a connecting link between the tree eucalypts and those of a shrubby type included under the general term of Mallee.

The outer bark is brownish or dark, and is shed in large flakes, leaving the surface of the stem and main branches smooth and greenish. The foliage is rather massive, leaves scattered, broadish or oval lance-shaped, of thick consistence, of equal colour and shining on both sides, not at all or only slightly curved, occasionally tinged with whitish bloom. The veins of the leaves are somewhat prominent, rather distant, the marginal vein distinctly removed from the edge of the leaf.

The clusters of flowers, seven or less in each, are in sprays; the buds are blunt or half-round ended, not angular; fruits small, cylinder-shaped or top-shaped, oval, three or oftener four celled, with a narrow rim.

In its relationship the Bull Mallee approaches closely to the Grey Box (*E. hemiphloia*), from which it mainly differs in never attaining the stately dimensions of that species; in the bark remaining smooth from the shedding of the outer layers; besides, the leaves are, as a rule (with exceptions), shorter and broader, the sprays of flowers are less ample and the flowers and fruits smaller, their stalklets shorter and the buds blunter than those of the Grey Box (*E. hemiphloia*).

The Bull Mallee (*E. Behriana*) claims also near affinity with Black Box (*E. bicolor*), but the bark of the latter does not shed, the leaves are narrower, thinner, of duller hue, and finer-veined, and the sprays of flowers more spreading; thus the resemblance of *E. Behriana* in foliage is closer to *E. hemiphloia*, but in flowers and fruits nearer to Black Box (*E. bicolor*), while in bark it differs from both. It is also related to *E. odorata*, the Scented Box, but the latter has a box bark, and the clusters of flowers occur at the shoulders of leaves, not in sprays.

The Bull Mallee is found near the sources of the Werribee River, on stony hills, extending thence to the Avoca and the north-west. Nothing definite is so far known as to the character of the honey gathered from this tree, but it most likely resembles that obtained from Grey Box, with which it also agrees in time of flowering and pollen production.

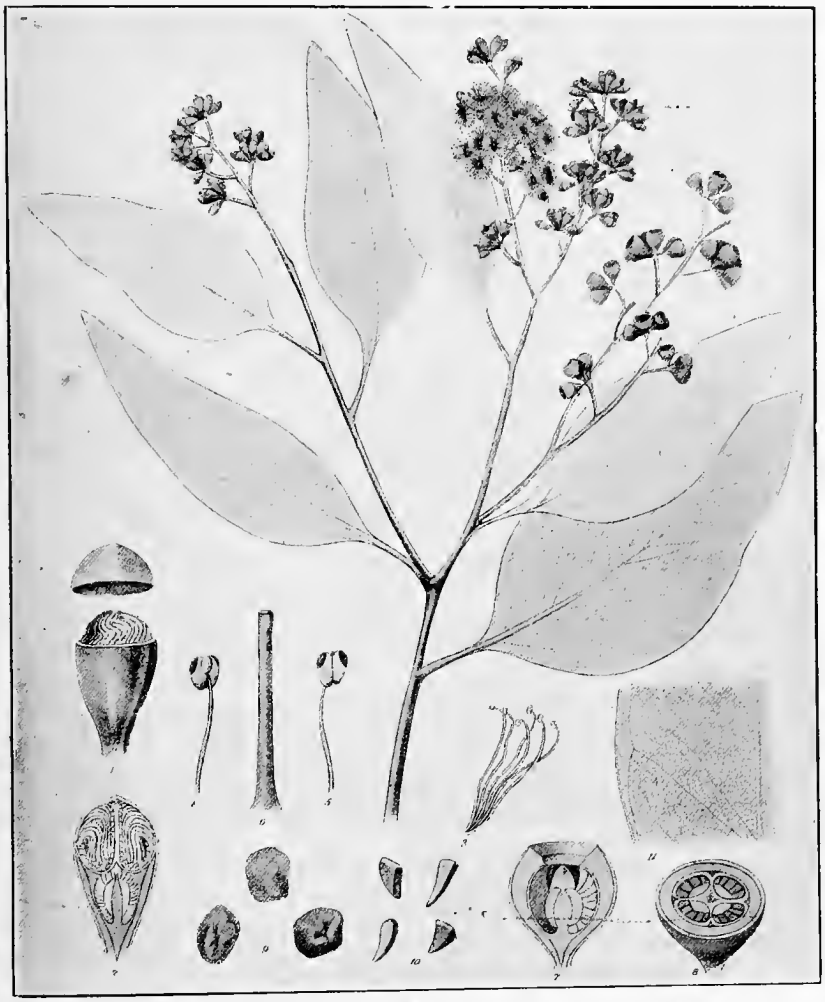


Fig. 52.—The Bull Mallee (*Eucalyptus Behriana*, F. v. M.).

The Hooked Mallee (*Eucalyptus uncinata*).

Fig. 53.

This species always remains of a shrubby growth, with several thin stems branched from near the base. It constitutes, chiefly along with the Oil Mallee (*E. oleosa*) and Slender Mallee (*E. calycogona*), a considerable portion of the Mallee scrub. The bark is smooth and greyish, or may assume on the branches and branchlets a dark hue, hence the name black mallee, by which it is known in some localities. Branches erect, never drooping. The leaves are scattered, on short stalks, usually narrow lance-shaped, of equal green on both sides and somewhat shining, occasionally they are broad lance-shaped, or very narrow and long, but always copiously dark dotted with oil glands. The veins exceedingly fine, rather close and spreading, but nowhere prominent, the marginal vein very close to the edge of the leaf which terminates (as in some other eucalypts) in a fine hooked point, from which feature in this instance the name is obtained. The clusters contain from three to nine flowers, and occur at the shoulders of leaves, or in short end sprays (occasionally), and on aged wood sideways from branchlets. The buds almost egg-shaped, but the lid sometimes narrow conical; the fruit small, half egg-shaped, mostly three, sometimes four celled.

The Hooked Mallee is one of those from the leaves of which eucalyptus oil is distilled.

As a nectar and pollen producer, this is one of the best of the mallee eucalypts known to beekeepers. It flowers profusely every second year during March, April, and May, in some localities from June to November, lasting about twelve weeks. The buds appear three to four months before flowering.

The honey is of good quality, not very dense, but this slight defect is perhaps due only to the comparatively high humidity of the atmosphere at time of gathering, and can be rectified by running it from the extractor through a suitable heating apparatus, as is now being done by some apiarists with honey from other late flowering trees. It candies, but not solidly.

There are large tracts of the Hooked Mallee available for apiarists, and, as the flowering of this species alternates with that of yellow box and red gum in the western half of the State, it provides a profitable field for operations by moving the apiaries to it every second year and back to the forest country the following season.

Moreover, this particular mallee, and some others, grow chiefly on soil too poor for cultivation purposes, and the bee pasture is therefore more likely to be permanent.

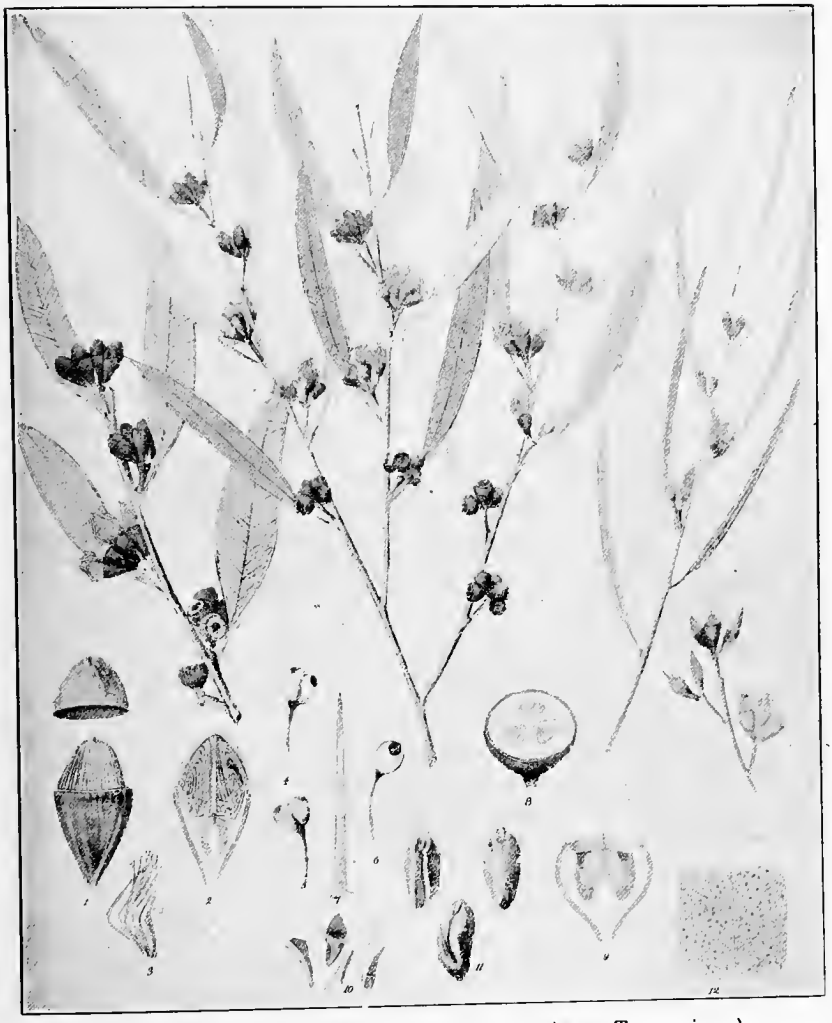


Fig. 53.—The Hooked Mallee (*Eucalyptus uncinata*, Turczaninow).

THE SLENDER MALLEE (*Eucalyptus calycogona.* Syn. *E. gracilis*).

Fig. 54.

A shrubby eucalpyt forming, together with the Giant Mallee (*E. incrassata*), the Hooked Mallee (*E. uncinata*), and the Oil Mallee (*E. oleosa*), the extensive Mallee Scrubs. Several stems usually spring from the one root, flowering occasionally at a height of 6 feet, but in the course of years rising to 25 feet. Bark silvery-grey or whitish. Leaves scattered, narrow lance-shaped or oblong linear, not very long, nor very uneven-sided, slightly curved, of equal colour and shining on both sides, veins hardly visible, not very spreading. Clusters of flowers singly at shoulders of leaves or some few endways, on thin stalks, with usually four to eight comparatively small flowers; buds lined lengthways with three to five angles; lid half-round or pyramid-shaped; fruits small, reversed conical, or somewhat urn-shaped, sometimes half egg-shaped, usually faintly angular, three or oftener four celled.

The Mallee Eucalypts vary considerably in the size and shape of leaves, buds, flowers, and fruits, the different species merging into one another so far as appearance goes, and it is therefore often difficult to identify variations. When more information is available as to the normal time and frequency of flowering and the length of time in bud of the various species, the apiarist will have an additional means of identification when in search of bee pasture.

Nothing distinctive in regard to the nectar and pollen production of the Slender Mallee is known at present.

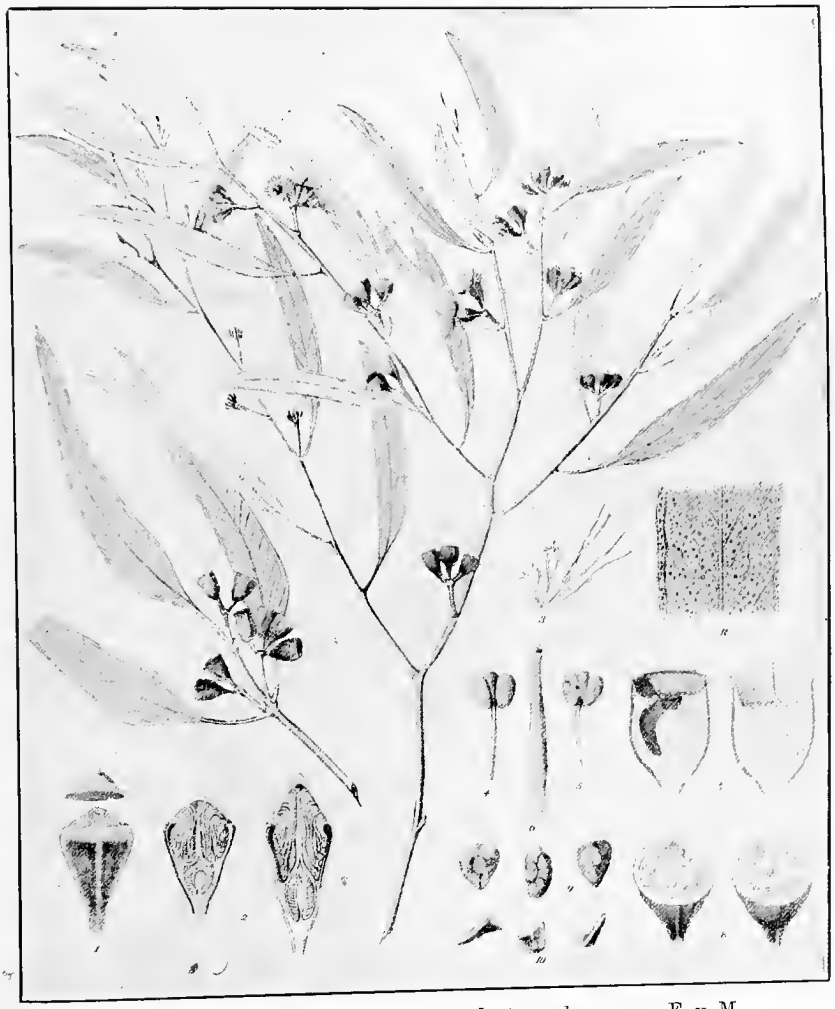


Fig. 54.—The Slender Mallee (*Eucalyptus calygcogona*, F. v. M. Syn. *E. gracilis*).

The Oil Mallee (*Eucalyptus oleosa*).

Fig. 55.

As the name indicates, this is one of the shrubs from which eucalyptus oil is distilled, but notwithstanding there are several eucalypts yielding a larger amount (a table showing the amounts obtained from the different Victorian eucalypts is published further on). The species under review form a large proportion of the Mallee Scrub (more or less intermixed with other vegetation), constituting tall bushes branched from the root on wide, particularly sandy tracts of arid inland depressions. In the ordinary bushy state it seldom exceeds 15 feet in height. The leaves are narrow or oblong, lance-shaped, pointed, slightly curved, of equal colour on both sides, often pale or grey-green, sometimes very shining and sometimes almost opaque; veins spreading very close together, very faint and often quite concealed; the oil glands are dark, very minute, and can only in young foliage be seen clear through the leaf. The clusters of flowers occur singly at shoulders of leaves or sideways on the branchlets on a slightly compressed stalk, bearing from four to eleven short-stalked flowers; the buds are usually long pointed, but sometimes shorter and blunter, resembling those of the Hooked Mallee (*E. uncinata*), the leaves of the latter are, however, generally narrower. The fruits of the Oil Mallee are small, cylindrical egg-shaped, with the valve flaps narrow pointed, erect, and often remaining connected at the points. Reference to the illustration, Fig. 55, shows that the fruits readily distinguish this species from others resembling it in leaf and other features.

The bark on aged plants gets corky but comes off in patches, while in younger plants it is smooth and pale. The porous horizontal roots, like those of some other Mallee Eucalypts, when broken, give a supply of almost pure water, hence it is also known locally as Water Mallee.

As a nectar and pollen-producer, this species has not, so far, been isolated from others in the company of which it grows.

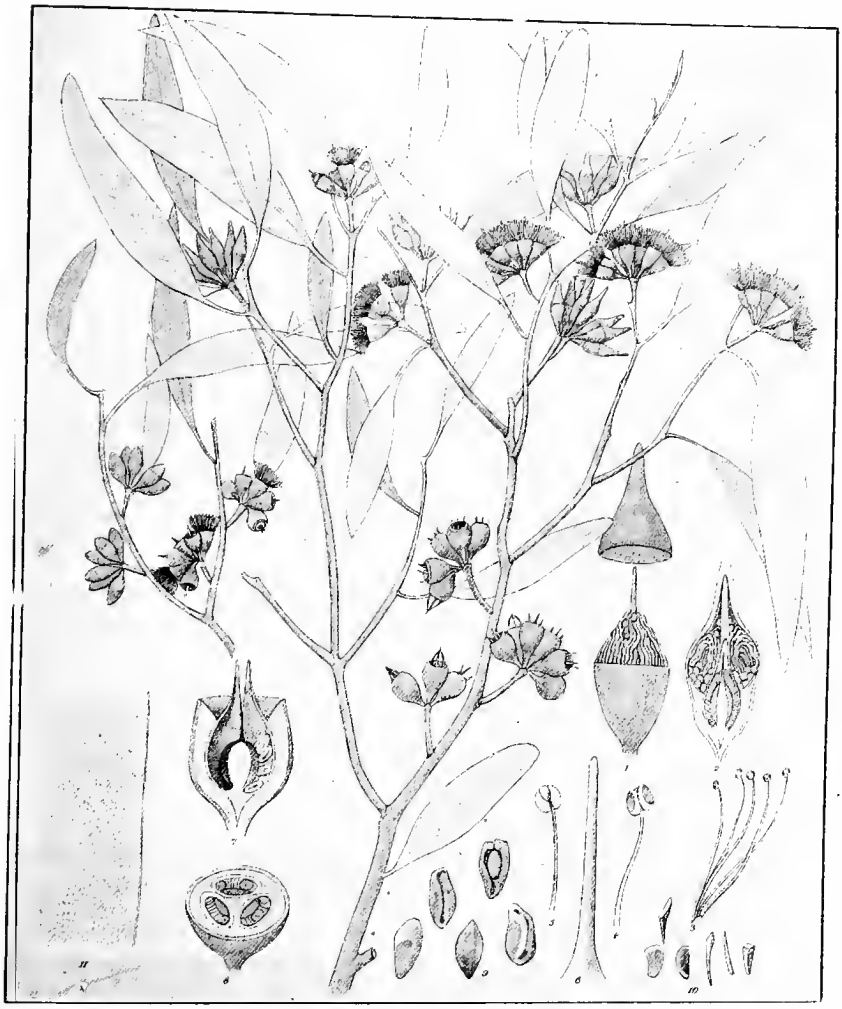


Fig. 55.—The Oil Mallee (*Eucalyptus oleosa*, F. v. M.).

The Giant Mallee (*Eucalyptus incrassata*).

Fig. 56.

A shrub usually of tall growth, with several stems from the same root, exceptionally rising to a tree up to 30 feet, but flowering already at a height of 4 feet. Bark smooth, outside of a whitish or reddish colour, persistent or shedding its outer layers; branchlets rather thick and rigid, not drooping. The leaves are almost evensided, ending in a narrow-pointed curved end; ovate or narrow lance-shaped, thick, of equal and light colour, as well as shining on both sides; veins close and spreading at rather an acute angle, the marginal vein distant from the edge of the leaf. Clusters of from three to eight flowers at the shoulders of leaves or sideways on the branchlets. The buds are shining, generally streaked lengthways, half-egg or somewhat bell-shaped, fruits half-egg or cylinder egg-shaped, more or less furrowed and streaked, three to four, rarely five celled. In regard to this species, it is difficult to give a clear definition of the buds and fruits, as there are intermediate forms (Fig. 56B) between the species and its varieties (Figs. 56A and D), angulosa and dumosa respectively, and gradations connecting them.

The Giant Mallee is one of the prevailing species which, with its varieties and other species, constitute the dense mallee scrub, and play an important part in the natural economy of the desert, aiding to mitigate the excessive heat. The power of the roots of the Mallee Eucalypts to absorb humidity from the soil is very great; it is well known that several species, including this and the one previously described, will yield water from the roots.

The Giant or thick-leaved Mallee produces both nectar and pollen, but the quantity and quality of the former are yet unknown; it flowers in March and April, and is in bud for fifteen months, so that for some time two generations of buds are in sight.

Angular Giant Mallee (*Eucalyptus incrassata*. Var. *angulosa*).

Fig. 56A.

This is a large-fruited variety of the species described previously, from which it is distinguished by its larger and more angular and streaked buds and fruits, which are usually deeply furrowed, while the stalk of the cluster of flowers is thick, compressed, and upwards, much expanded, and the lid of the bud suddenly contracted into a slender point; the leaves also are somewhat broader than those of the other varieties, so that at first sight this variety is very distinct from the others (Fig. 56B, 56C, and 56D); as, however, there are gradations connecting the different forms, they cannot be looked upon as separate species.

What has been said of the species previously described in regard to nectar and pollen probably also applies to this variety.

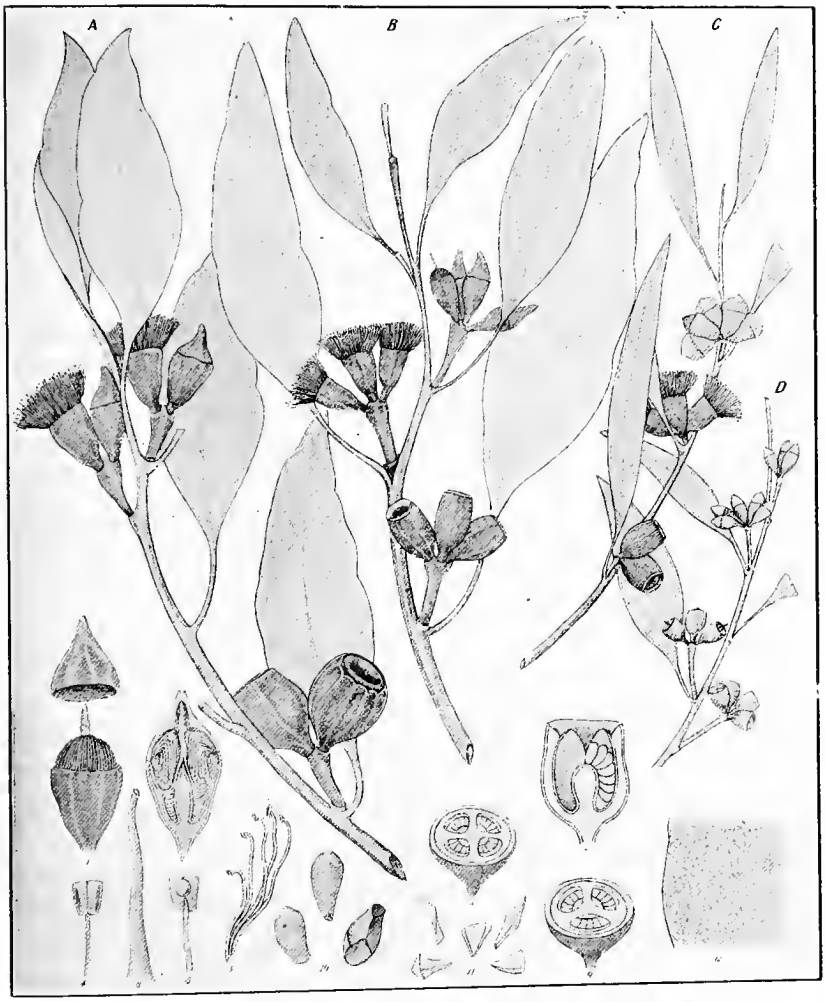


Fig. 56.—The Giant Mallee (*Eucalyptus incrassata*, F. v. M.).

A. *Euc. incrassata*, var. angulosa.
B. *Euc. incrassata*, intermediate form.
C. *Euc. incrassata*, normal form.
D. *Euc. incrassata*, var. dumosa.

The Small Giant Mallee (*Eucalyptus incrassata.* Var. *dumosa.* Syn. *Eucalyptus dumosa,* A. Cunn.).

Fig. 56D on preceding page.

This variety is classed as a distinct species by Baker and Smith, and described in their *Research on the Eucalypts* as follows:—Found in the interior, and rarely attains to tree form. The bark is white, persistent and smooth. Hence the local name "White Mallee." Leaves from oblong or almost ovate and blunt to lance-shaped, under 4 inches long, short pointed, fleshy, shining, and of a dull yellow colour; veins fairly prominent, lateral ones distinct, marginal vein removed from the edge. Oil glands quite obscured. Clusters of flowers at shoulders of leaves, bearing a few flowers on short stalklets. Lower part of bud cylindrical, occasionally angular; lid of bud short conical."

This is a prominent Victorian Mallee, large tracts of country being marked on maps of the State as "dense scrubs of Eucalyptus dumosa." Unfortunately, so far, no information as to the suitability for honey production of these large unoccupied areas in the north-west and west are yet available; but, judging by the results obtained on the fringe of the Mallee, this class of country should afford great scope for apicultural enterprise, the Mallee flora being more of a nectar-yielding kind than that of moister districts, and the climate exceptionally suitable during the Winter.

The Blue Mallee (*Eucalyptus polybractea*).

Fig. 57.

One of the shrub Eucalypts with bluish-green bloom on the foliage, hence the name Blue Mallee; the branchlets are angular, the leaves are lance-shaped (those on the early shoots lance to long lance-shaped) erect, rarely unevensided, narrow, mostly 3 inches long, pointed often with the point curved backwards, not shining, the midrib raised on the underside, giving the leaf a strong resemblance to that of the olive. The lateral veins are oblique, spreading, finely marked, only occasionally distinctly pronounced, the marginal vein removed from the edge. Oil glands very numerous. The flower clusters on short stalks at shoulders of leaves bearing from eight to twelve flowers; buds angular, with a frosted appearance in the early stages of development, and surrounded by numerous pointed ribbed whitish bracts (small leafy appendages), from which distinguishing feature the botanical name "polybractea" is derived. The lower part of the bud tapers conically into a short stalklet, while the upper end or lid is blunt, or only very slightly pointed; fruit half-round to pear-shaped, and frosted in appearance.

The Blue Mallee differs from others in never attaining tree form; by the above-mentioned bracts surrounding the buds and their angular shape; by the leaves; the four-cornered branchlets and the whitish or bluish bloom which is characteristic of this species.

Fig. 57.—The Blue Mallee (*Eucalyptus polybractea*, R. T. Baker).
[Illustration from "A Research on the Eucalypts, &c.," by Messrs. R. T. Baker and H. G. Smith.]

THE GREEN MALLEE (*Eucalyptus viridis.* Syn. *Eucalyptus acaciodes*).

Fig. 58.

A Mallee of dense growth, the stems usually 2 to 3 inches in diameter, though occasionally measuring 20 feet in height, it rarely grows to tree size. Bark smooth, or only rough at the base of the larger trees. Sucker leaves constantly narrower than normal leaves. Leaves erect, narrow, lance-shaped to almost linear, mostly 2 to 4 inches long, pointed or blunt-ended, not shining, but of a rich green colour, a feature from which both the vernacular and the botanical name is derived. The veins of the leaves are rather obscured, spreading, the marginal vein not far from the edge. Flower clusters at shoulders of leaves, bearing from seven to twelve flowers. Buds pear-shaped, with half-round, short-pointed lid; fruit pear-shaped, with a thin rim contracted at the edge.

The bark is of a fibrous nature, but not deeply furrowed, and of a peculiar rich yellow colour on the inner side. Timber dark and close grained, interlocked, yellowish-coloured. Being a Mallee, it is only rarely found in tree form, when it has a tendency to become hollow in the stem.

As in the case of the one previously described, no information can yet be given as to its habits of flowering and its value for honey production.

Fig. 58.—The Green Mallee (*Eucalyptus viridis.* Syn. *acaciodes*).

EUCALYPTUS OIL.

As inquiries are frequently received as to the amount of oil obtainable from the different species of eucalypts, and only very expensive scientific books are available on the subject, it appears to be advisable to publish a list of the Victorian eucalypts under their common and also their botanical names, together with the percentage of oil and the amount in lbs. and ozs. obtainable per 1,000 lbs. of foliage.

It must, however, not be understood that those species containing the highest percentage of oil would be the most profitable in the commercial production of eucalyptus oil.

The oils of different species vary considerably in quality and in value. Some of the eucalypts with a high percentage of oil are large trees, and involve a considerably larger amount of labour and a greater amount of waste than some of the Mallee species, the foliage of which is easy to collect, and the oil, though not present in the highest percentages, is of finer quality.

There are, of course, other local factors, such as a supply of water, distance from railway, &c., which are not within the scope of this publication.

Amount of oil obtained per 1,000 lbs. of foliage of 50 species of eucalypts as given by Baker and Smith in *Research on the Eucalypts.*

AMOUNT OF OIL OBTAINED PER 1,000 LBS. FOLIAGE.

Vernacular Name.	Botanical Name.	lbs.	ozs.
1. Narrow-leaf Peppermint	*Eucalyptus Australiana*	33	15
2. Broad-leaf Peppermint	,, *dives*	22	5
3. Red Mountain Ash	,, *gigantea*	17	10
4. River White Gum	,, *radiata*	16	7
5. Whitetop Gum	,, *vitrea*	14	13
6. Gully Gum	,, *Smithii*	14	5
7. Blue Mallee	,, *polybractea*	13	8
8. Spotted Blue Gum	,, *Maideni*	13	1
9. Mealy Stringybark	,, *cinerea*	11	14
10. Green Mallee	,, *viridis*	10	10
11. Small Giant Mallee	,, *dumosa*	10	0
12. Oil Mallee	,, *oleosa*	9	11
13. Gippsland Box	,, *Bosistoana*	9	11
14. Slender Mallee	,, *calycogona*	9	0
15. Mountain Gum	,, *goniocalyx*	8	13
16. Giant Mallee	,, *incrassata*	8	12
17. White Brittle Gum	,, *maculosa*	8	7
18. Red Box	,, *polyanthemos*	8	6
19. Sallow Gum	,, *camphora*	8	6
20. Blue Gum	,, *globulus*	7	7
21. White Stringybark	,, *eugenioides*	7	7
22. Long-leaf Box	,, *elæophora*	7	5
23. Messmate	,, *obliqua*	6	12
24. Yellow Box	,, *melliodora*	6	12
25. Scented Box	,, *odorata*	6	6
26. Peppermint Gum (Sydney Peppermint)	,, *piperita*	6	4
27. But But	,, *Bridgesiana*	6	3
28. Bull Mallee	,, *Behriana*	6	2
29. Lemon-scented Gum	,, *citriodora*	5	14
30. Grey Box	,, *hemiphloia*	5	9
31. Red Ironbark	,, *sideroxylon*	5	6
32. Woolly Butt	,, *longifolia*	5	6
33. Black Box	,, *bicolor*	5	3
34. Forest Red Gum	,, *tereticornis*	4	13
35. Hooked Mallee	,, *uncinata*	4	5
36. Silvertop	,, *Sieberiana*	4	3
37. Apple Gum	,, *Stuartiana*	3	15
38. Manna Gum	,, *viminalis*	3	9
39. River Red Gum	,, *rostrata*	3	0
40. Black Sallee	,, *stellulata*	2	15
41. Red Stringybark	,, *macrorrhyncha*	2	12
42. Scribbly Gum	,, *hæmastoma*	2	7
43. Swamp Gum	,, *ovata*	2	0
44. Spotted Gum	,, *maculata*	1	11
45. Black Butt	,, *pilularis*	1	5
46. Brown Stringybark	,, *capitellata*	1	0
47. Grey Ironbark	,, *paniculata*	0	14
48. Mahogany Gum	,, *botryoides*	0	14
49. Blood Wood	,, *corymbosa*	0	10
50. Candlebark Gum	,, *rubida*	0	1

NOTE.—Numbers 16, 25, and 35 do not appear in Messrs. Baker & Smith's list, and are taken from F. von Mueller's *Eucalyptographia.*

VIII. Banksias (Honeysuckles).

The Coast Banksia (*Banksia integrifolia.*)

Fig. 59.

There are over forty species of Banksia, but five only occur as natives in Victoria, of which the Coast Banksia is the largest, developing sometimes into a tree 40 to 50 feet high, with a trunk diameter up to 4 feet. It is commonly known as Honeysuckle, Tree-Honeysuckle, and most appropriately as Coast Honeysuckle, on account of the situations it frequents. It is also called White Honeysuckle to distinguish it from Red Honeysuckle (Banksia serrata), the timber of which is far redder. The botanical name of this group, "Banksia," is in honour of Sir Joseph Banks, who, for long, was president of the Royal Society of London, while the specific name, integrifolia, signifies "entire leaf," in reference to the margin of the leaf.

The leaves are lance-shaped, or oblong, wedge-shaped, blunt-ended, quite entire, but sometimes irregularly toothed, 3 to 4 inches long, in some specimens much longer, and from ½ to near 1 inch broad; white underneath, with a not very prominent network of veins. The young shoots and young leaves are covered with woolly hair till nearly full grown. Flower spikes from 3 to 6 inches long, oblong, cylindrical. Fruit cone oblong, cylindrical, seed capsules prominent, but not thick as in the Saw or Red Banksia (Banksia serrata).

The Coast Banksia is found in the south-east of Victoria, but it has also been reported from the Grampians.

The timber is pinkish in colour, beautifully grained, and takes a good polish; it is, however, but little used as an ornamental timber, being employed chiefly for ribs and knees in boats, bullock yokes, &c.

The flower is, as a rule, a profuse yielder of both nectar and pollen. The honey obtained from it is somewhat high-coloured, rather strong, and has a distinct aroma peculiar to the Banksias; it candies quickly and hard.

Fig. 59.—The Coast Banksia (*Banksia integrifolia*).

The Silver Banksia (*Banksia marginata*).

Fig. 60.

The Silver Banksia, generally known as "Honeysuckle," is the most widely distributed of the Victorian species, being found east, west, north, and south. It is usually a bushy shrub of from 10 to 15 feet high, growing sometimes into a tree of considerable size, sometimes low, straggling, or depressed.

Leaves broadly linear, or oblong, lance-shaped, blunt, often square at the ends, usually smooth-edged, 1 to 2 inches long, but in flowerless branches, or even on some flowering specimens, some or all the leaves are much larger, more or less toothed, all leaves very white underneath (hence the common name).

Flower spikes oblong, cylindrical, 2 to 3, rarely 4 inches long; in some dwarf varieties nearly globular.

Fruit cone oblong, cylindrical; seed capsules prominent, not thick, rounded, $\frac{1}{2}$ inch broad, at first covered with hair.

The wood is soft, porous, and spongy, when dead, and in a certain stage of decay, it makes the best fuel for the beekeepers' smoker, the smoke given off being clean, cool, and of not unpleasant odour.

The flower yields nectar and pollen freely after good autumn rains. The honey is somewhat strong, and candies quickly. The Silver Banksia blossoms in some districts from February to May; in others from April to July. Near the Grampians, there is a dwarf form as well as the normal type, from which it in no way differs botanically.

In many localities where the Silver Banksia was formerly plentiful, it is now almost extinct. The former trees have died of old age, or have been cut down in drought seasons as feed for stock, by which the leaves are so readily eaten, that no seedlings survive.

Fig. 60.—The Silver Banksia (*Banksia marginata*).

The Saw Banksia (*Banksia serrata*).

Fig. 61.

A bushy tree confined to the east of Victoria. The leaves are oblong, lance-shaped, pointed or blunt, regularly and deeply toothed, 3 to 6 inches long, $\frac{1}{2}$ to 1 inch wide, leathery and flat, hoary or rarely white underneath.

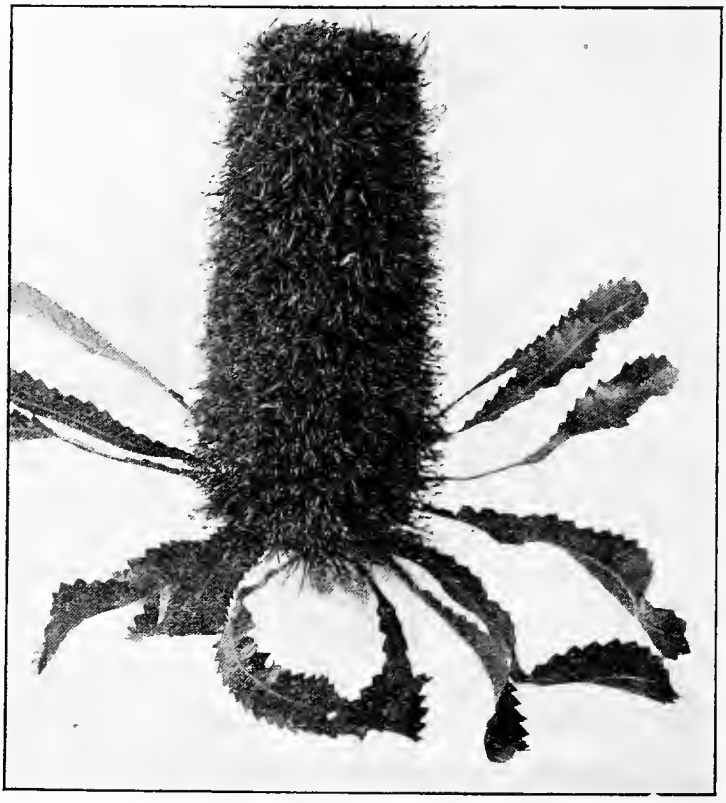


Fig. 61.—The Saw Banksia (*Banksia serrata*).

Flower spikes oblong, cylindrical, very thick, 3 to 6 inches long. Fruiting cone matted, hairy; seed capsules very prominent, thick, and hard, about 1 inch broad.

Wood, purplish, mahogany coloured, useful for furniture.

The Saw (or Red) Banksia flowers in December and January, and yields nectar very heavily under favorable conditions, the honey being much of the character of the preceding species and those following.

The Desert Banksia (*Banksia ornata*).

Fig. 62.

A shrub, 5 to 6 feet high, found in the north-west and south-west of Victoria, generally in sandy or desert country, and known to the bee-keepers of the western districts as "Banksia," without any distinctive term, the Silver Banksia in a like manner being termed "Honeysuckle."

The Desert Banksia is a rather ornamental shrub, compact in structure, with a deep blue-green foliage. The leaves are oblong, wedge-shaped towards the stalk, with regular teeth on the edges, 2 to 4 inches long, $\frac{1}{2}$ to $\frac{3}{4}$ inches broad, with the transverse veins prominent underneath.

Fig. 62.

Flower spikes, oblong, egg-shaped, 2 to 4 inches long, or globular. Fruiting cone egg-shaped, seed capsules very thick, and fully $\frac{3}{4}$ inch broad.

It flowers from April to July, and is a heavy yielder of nectar and pollen, so that brood rearing is kept up in the hives right into winter, insuring successful wintering of the bees, which in part is due to the comparative warmth of the localities where this Banksia grows. The honey, like that from the other Banksias, is not first class, candies quickly, sometimes even in the outside combs of the hive, but the Desert Banksia is nevertheless a most valuable bee plant, taking in autumn the place which the Cape weed fills in spring.

THE HILL BANKSIA (*Banksia collina*).

Fig. 63.

A tall, erect shrub attaining a height of 8 to 12 feet, found principally in the south, north-east, and east of the State, and also sometimes known as Hairpin, on account of the wirelike bent back stamens of the flower.

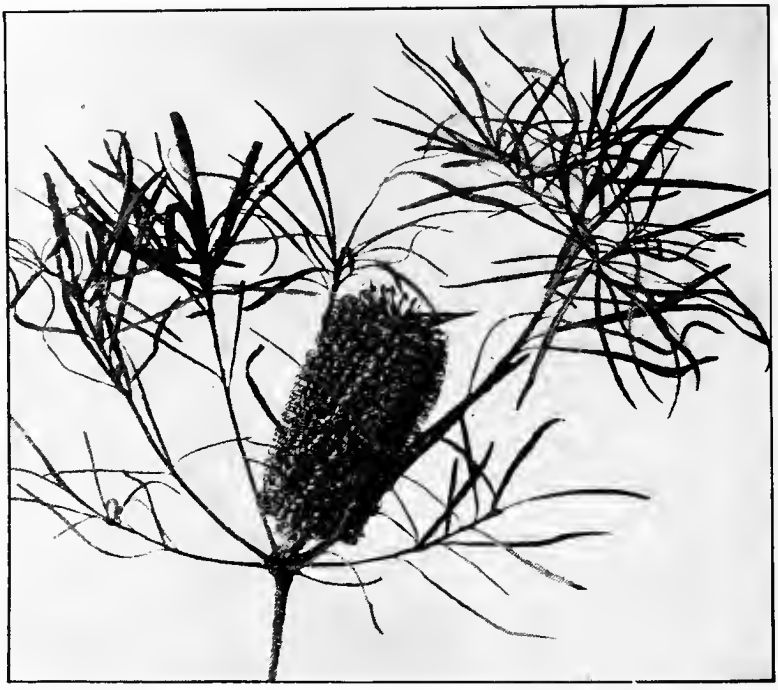


Fig. 63.

Leaves narrow, linear, 1½ to 3 inches long, more or less toothed, or rarely quite even. Flower spike oblong, cylindrical, 3 to 6 inches long. Fruiting cone cylindrical, seed capsules thick and scarcely protruding.

The Hill Banksia is said to produce nectar so freely at times that it runs down on to the ground. Nothing definite, however, is known on this point, as probably no large apiary has so far been located near a considerable number of this Banksia. Like the Desert Banksia, it is ornamental, and worthy of cultivation in gardens.

IX. Tea Trees.

Tea Tree (*Leptospermum*).

A group of shrubs which are seldom dwarf, and sometimes assume the dimensions of small trees. The leaves are small, scattered, the branchlets sometimes crowded. The open five-petalled white, or sometimes pinkish, flowers are mostly stalkless, the fruit three or more celled.

There are seven distinct species in Victoria, some of which are variable in the size and shape of leaves and flowers, making differentiation somewhat difficult. All the species have one characteristic in common, namely, that the flowers generally secrete nectar very freely, which, when transformed into honey by the bees, is in colour about one of the darkest of Victorian honeys, has a strong, rank flavour, and, as it sets like jelly in the cells, it cannot be removed from the combs in the extractor. It is quite unsuitable for marketing as table honey, although people living in tea-tree country, and getting it out of their own hives, become used to it, and even like it. One use to which this honey can be put is in the manufacture of plug tobacco, for which purpose some quantity of honey is used annually. When newly-gathered tea-tree honey is quite thin, but as soon as it has reached a certain degree of density it sets into a jelly-like condition, and the evaporation then ceases, so that it always contains a higher percentage of water than others of our honeys. After removal from the combs, which can only be done by pressing or melting, it often partially candies with a very coarse grain.

In the locating of apiaries for the commercial production of honey it is best to keep away from tea tree belts, but in seasons when other sources fail bees can, with advantage, be moved on to tea-tree country. Notwithstanding its unpleasant flavour and jelly-like texture the honey is excellent bee food, and as the flower of the tea tree yields pollen, as well as nectar, thus encouraging brood rearing, the colonies are therefore always in good condition.

The tea-tree flavour is in Australia often erroneously called "eucalyptus flavour," while what in Great Britain is known as the eucalyptus flavour of Australian honey is what we here so much appreciate as the "box tree flavour."

The Coast Tea Tree (*Leptospermum lævigatum*).

This is the common Tea Tree, plentiful in the sandy country along the sea shore; it is, however, also found inland. In size it ranges from a shrub to a small tree attaining a height of 20 to 30 feet.

The leaves are oblong, broader at the end, or narrow, oblong, and blunt ended $\frac{1}{2}$ to $\frac{3}{4}$ inch, but sometimes 1 inch long, more or less visibly three nerved. The foliage has a dull appearance. The flowers are white, and rather large in comparison with the other species. They are stalkless and occur at shoulders, singly, and on rare occasions two together, on a short common stalklet. The fruit is five to ten celled, and almost flat topped.

The Coast Tea Tree is useful in binding loose sand and when closely planted makes a good hedge; it flowers in September and October, and is the cause of the strong flavour of honey from hives near the sea side.

The Manuka (*Leptospermum scoparium*).

Figs. 64 and 65.

Of the seven species of Leptospermum found in Victoria the Manuka is the most widely distributed. Manuka is the aboriginal name, but it is known in the bush as Tea-Tree, Ti-Tree, and Wild May. It is a rigid, very much branched shrub, and the young shoots have generally a silky appearance. In alpine situations it is sometimes low and almost prostrate, but more usually erect and attaining occasionally to a height of 12 feet. The leaves are from egg-shaped pointed to narrow-lance shaped, sharply pointed, and generally under ½ inch long. The adult foliage is usually smooth and hairless. The flowers are white, stalkless, and occur singly in the axils of leaves or terminating short lateral branchlets in the case of forms flowering early in the season (Fig. 64), while in late districts the flowers are well down below the new leaf growth (Fig. 65), so that the two forms give the impression of being two distinct species. There is also great variation in the shape and size of the leaves of this species in different localities, and as the different species merge into one another they are very difficult to distinguish. From the apiarist's point of view, however, there is little difference between the species, the honey from all of them having the same characteristics. The Manuka is common in Victoria in heathlands and moist situations. It flowers according to locality in October, November, December, January, and February, Fig. 64 representing it up to December. The forms flowering in January and February are shown in Fig. 65.

Fig. 64.

Fig. 65.—Manuka (*Leptospermum scoparium*).

The Myrrh Tea Tree (*Leptospermum myrsinoides*).

Fig. 66.

A somewhat dwarf species, bushy and rather ornamental, with white or somewhat pinkish flowers. In habit it sometimes approaches the Manuka (*L. scoparium*), but the leaves are not so sharp, sometimes ½ inch long, but generally less, oblong linear or broader at the end,

Fig. 66.

blunt ended, rigid, and concave. The flowers are small, white, or pinkish, almost all on very short, leafy branchlets, often several flowers together. This species is common in heathy tracts in the western districts, the north-west, the Wimmera, and the Snowy River. In most localities it flowers in September and October.

The Woolly Tea Tree (*Leptospermum lanigerum*).

A tall shrub, sometimes growing into a small tree, rarely low and bushy. The branchlets and the underside of the leaves usually beset with short, silky hairlets, hence, both the vernacular name "Woolly Tea Tree," and the specific "lanigerum" signifying woolly.

The leaves are from ovate oblong to elliptical or narrow oblong, very variable in size and shape, normally not above ½ inch long. In some varieties the leaves are all very much smaller, but in some luxuriant specimens they are ¾ inch long, or even longer, more or less hoary-silky, or hairy on the underside, or on both sides; but rarely totally hairless. The leaves when broad and thin show one, three, or five nerves. More frequently, however, they are thick leathery, and the nerves scarcely visible.

The flowers are solitary on short leafy branchlets or sometimes on the branches, stalkless, and without intervening leaves, white and often rather large. This variety of tea tree flowers in October, November, January, and February, according to locality. The wood is hard and heavy, and was used by the aborigines for making spear handles. The Woolly Tea Tree is found in all parts of Victoria, particularly in Gippsland, mountain districts, and the neighbourhood of Melbourne.

The Myrtle Tea Tree (*Leptospermum myrtifolium*).

A tall shrub, attaining a height of 8 to 10 feet, but flowering already when only 1 to 2 feet high. The branches are usually slender, smooth, or silky, the leaves generally small, and rarely ½ inch long, oblong, or broader at the end, flat or hollow on the surface, nerveless, or one or three nerved, and either smooth or silky white. The flowers are of medium size, all or nearly all occur singly at the ends of short leafy branches, and are stalkless. The wood is dark in colour, tough and close grained. The Myrtle Tea Tree is found in the Grampians, and flowers in November.

The Tantoon (*Leptospermum flavescens*).

Usually a tall shrub, attaining a height of 8 to 15 feet, with a stem diameter of 5 to 8 inches. The wood is hard, and close grained. Its leaves are from narrow oblong to narrow lance-shaped, broadly oblong, or even broader at the end than at the base, blunt ended or scarcely pointed, ¾ inch long in the largest forms, but usually under ½ inch, and sometimes all very small. The leaves are generally smooth, rigid, flat, and nerveless, or one or three nerved, the young parts minutely silky. The flowers are white or sometimes turning slightly yellowish; they occur singly at the end of branchlets, or at the shoulders of leaves, and almost stalkless. The fruit is hard, quite convex at the summit, and usually five celled.

The Tantoon is found in the Buffalo Range, and on the Yarra, Goulburn, and Ovens Rivers.

X. Honey Myrtles or Bottlebrush Tea Trees

(*Melaleuca.*)

There are over ninety species of Melaleucas or Honey Myrtles, thirteen of which occur in Victoria. They are known under diverse local names such as Tea Tree, Bottlebrush, Bottlebrush Tea Tree and Paper Bark. They are, however, quite distinct in their floral characters from the Tea Trees proper (Leptospermum), but resemble closely and merge into the genus Callistemon or Bottlebrushes. From the latter the Melaceuca differ chiefly in having smaller leaves and the smaller, shorter and different coloured flowers.

Swamp Paper Bark (*Melaleuca ericifolia*).

One of the commonest of the Honey Myrtles or Bottlebrush Tea Trees found along watercourses and swamps of Southern, Eastern and North-Eastern districts. It is a shrub or tree, attaining sometimes a considerable height and stem diameter. The leaves are scattered, numerous, narrow linear, blunt ended, rarely sharply pointed, seldom over $\frac{1}{2}$ inch long.

Flowers yellowish white (rarely red) in oblong or nearly globular terminal heads or in oblong cylindrical spikes $\frac{1}{2}$ to 1 inch long.

The wood is often extensively used for bush fences, rustic work, clothes props, &c.

The honey obtained from this species is pale in colour, somewhat jelly like, rather strong, but not unextractable, when fresh, like that of Leptospermums.

The name Paper Bark is on account of the soft paperlike nature of the inner bark of large specimens.

The Scented Paper Bark (*Melaleuca squarrosa*).

Fig. 67.

A handsome erect shrub, usually 6 to 10 feet high, but sometimes twice that height. The leaves broadly ovate to ovate lanceolate, sharply pointed, generally under $\frac{1}{2}$ inch long, five or seven nerved, are arranged in four parallel lines along the stem. The flowers are yellowish white, stalkless, in oblong or cylindrical spikes, 1 to 2 inches long. At first they are at the end of branchlets, but the axis often growing out before flowering is over.

This species is fairly plentiful in the Grampians country, but also occurs in other districts; it is easily distinguished from other species by the four parallel and symmetrical rows of leaves and the paperlike inner bark, which, however, it shares with other species. The flowers are fragrant, hence the common name Scented Paper Bark.

It produces both nectar and pollen resembling that of the previous species.

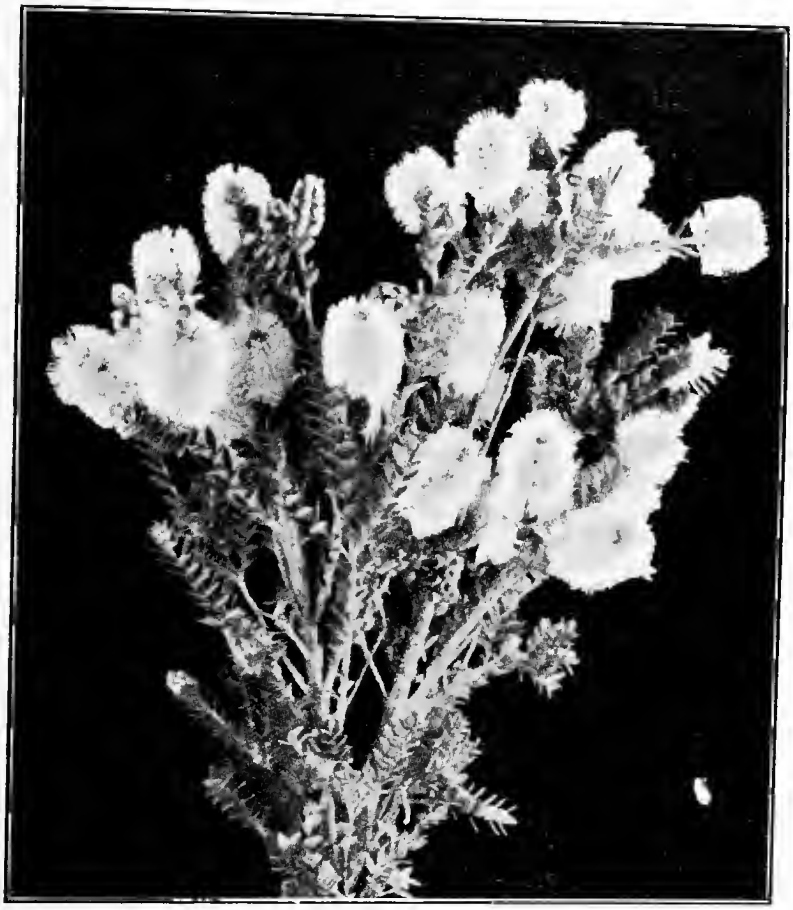


Fig. 67.—Scented Paper Bark *Melaleuca squarrosa*).
[From E. E. Pescott's *Native Flowers of Victoria*.]

The Moonah (*Melaleuca parviflora*).

A tall shrub or tree with white or yellowish flowers, in loose oblong cylindrical spikes 1 to 2 inches long which are rarely terminal, the axis growing out very early into a leafy shoot. The leaves are scattered, rather crowded, lance shaped or oblong, narrow pointed or blunt ended, rarely exceeding $\frac{1}{2}$ inch in length. This species occurs in the Port Phillip district, Bacchus Marsh, and on the Murray.

The Snowy Honey Myrtle (*Melaleuca acuminata*).

A shrub or tree with sharply-pointed, lance-shaped, or oblong leaves and whitish flowers in lateral clusters on the previous year's branches. Found in the Wimmera and Murray Desert.

The Red Honey Myrtle (*Melaleuca hypericifolia*).

A tall shrub, with red flowers larger than those of other species. Leaves $\frac{3}{4}$ to $1\frac{1}{2}$ inch long resembling the leaves of St. John's Wort (*Hypericum perforatum*), hence the specific name hypericifolia. It is a New South Wales species, but extends into Victoria.

The Slender Honey Myrtle (*Melaleuca gibbosa*).

An erect shrub, 6 to 12 feet high, with rather small and not numerous purple flowers in oblong or almost globular lateral heads often forming the base of leafy branches. Leaves mostly opposite, from 3-16 to $\frac{3}{8}$ inch long, blunt-ended or tipped with sharp points. Found in marshy places in the Grampians, the Glenelg River, and Portland.

The Cross Honey Myrtle (*Melaleuca decussata*).

A tall shrub attaining sometimes 20 feet, with oblong, lance-shaped or almost linear, blunt or pointed leaves $\frac{1}{4}$ to $\frac{1}{2}$ inch long and rather small purplish flowers in oblong or almost globular lateral heads which are usually barren or cylindrical interrupted spikes forming the base of leafy branches. Found chiefly in the Grampians.

The Purple Honey Myrtle (*Melaleuca Wilsoni*).

A tall handsome shrub with leaves $\frac{1}{4}$ to $\frac{1}{2}$ inch long, linear or linear lance shaped pointed. Flowers purplish red. Localities: Wimmera and Lake Hindmarsh.

The Bracelet Honey Myrtle (*Melaleuca armilaris*).

A tall shrub or tree up to 30 feet, common on river banks at the south-eastern extremity of the State.

Leaves, scattered, crowded, linear, pointed, $\frac{1}{2}$ inch long, or rather more, flowers whitish.

The Broom Honey Myrtle (*Melaleuca uncinata*).

A tall shrub with linear (narrow) alternate leaves 1 to 2 inches long. Flowers white, small and numerous, in very dense oblong or almost globular terminal heads, the centre often growing out into a shoot before flowering is over. Wood hard, close, and durable.

Wimmera and north-west of Victoria.

The Mealy Honey Myrtle (*Melaleuca squamea*).

A shrub with numerous scattered, usually spreading leaves, egg or lance shaped pointed to almost linear, distinctly three nerved, $\frac{1}{4}$ rarely $\frac{1}{2}$ inch long. Flowers reddish purple, white or yellowish in small globular terminal heads.

In the Grampians and on the Glenelg.

The Blistered Honey Myrtle (*Melaleuca palmatrurosum*. Syn. *M. pustulata*).

A bushy scrub, 2 to 6 feet in height. Leaves scattered, often crowded, from oblong or lance-shaped to almost linear, blunt ended, $\frac{1}{4}$ inch long or less. Flowers small, whitish, not numerous, in small terminal leafy heads, the centre soon growing out into a leafy shoot. Known as Paper Bark in the Wimmera.

The Mallee Honey Myrtle (*Melaleuca neglecta*).

A species only recently isolated from the preceding one with which for all practical purposes it is identical.

The Bottlebrushes (*Callistemon*).

The Bottlebrushes are a genus confined to Australia. There are sixteen species, eight of which are native to Victoria. They are closely allied to the Honey Myrtles or Bottlebrush Tea-trees (*Melaleuca*), which they resemble remarkably in their floral characters, differing from them, however, in the length and breadth of their leaves and the length and colour of the stamens of the flower. The features which distinguish the Bottlebrushes from the Honey Myrtles or Bottlebrush Tea-trees are the larger leaves as well as the longer stamens of the former, which are always over half an inch in length while those of the Honey Myrtles do not exceed half an inch.

All the Bottlebrushes yield nectar and pollen, and although the honey obtained from them cannot be considered of the best quality, these shrubs are nevertheless of great value to the bee-keeper in the localities where they grow, as they provide nectar and pollen in October, November, and December, according to the species, a time when both these bee foods are most needed for the full development of the colonies.

The Scarlet Bottlebrush (*Callistemon rugulosus*. Syn. *C. coccineus*).

A shrub very closely allied to the Crimson Bottlebrush. The leaves are lance-shaped, rigid, almost pungent, from 1 to 1½ inches long, the mid rib prominent. The flowers are scarlet, not very dense, stamens ¾ to 1 inch long, with yellow anthers.

The Scarlet Bottlebrush is found in the Grampians country and flowers in November and December. Like most of the Bottlebrushes it frequents the banks of rivers and creeks, and other moist situations.

The Crimson Bottlebrush (*Callistemon lanceolatus*).

Fig. 68.

The Crimson Bottlebrush is usually a tall shrub sometimes attaining a height of 30 feet, but occasionally the shrubs are low and bushy. The leaves are lance-shaped, variable in breadth, usually pointed, and from 1½ to 2 inches long, but varying from 1 to 3 inches. The crimson flower spikes are from 2 to 4 inches long, and not very dense. The petals are greenish or reddish, and the stamens crimson, in some specimens deeply coloured, in others much paler, more slender, and scarcely above half an inch in length. The Crimson Bottlebrush is found in East Gippsland. It yields both nectar and pollen, and flowers generally in October.

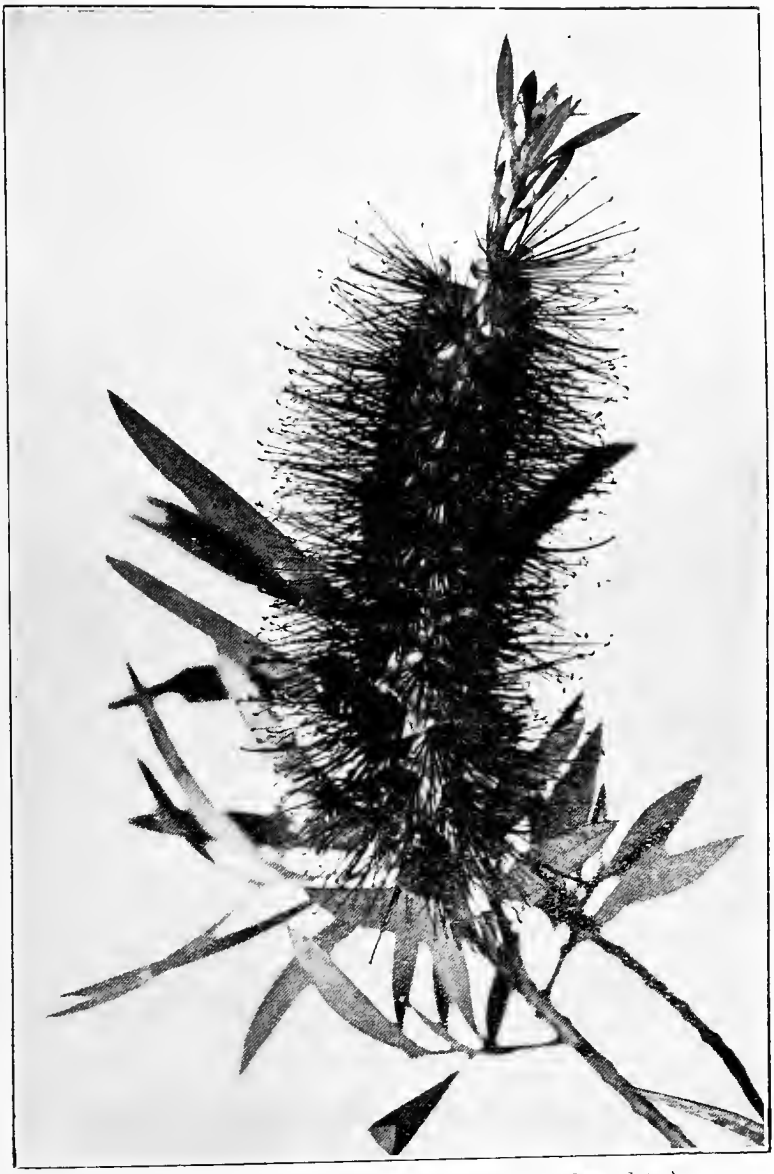


Fig. 68.—The Crimson Bottlebrush (*Callistemon lanceolatus*).

The Willow Bottlebrush (*Callistemon salignus.*)

A tall shrub or small tree, attaining sometimes 30 to 40 feet in height, and often indistinguishable in foliage and flowers from the Crimson Bottlebrush (*Callistemon lanceolatus*) The leaves are, however, usually more pointed, and the flowers generally smaller, than in the Crimson Bottlebrush.

It is found in all parts of Victoria, particularly along the Yarra, Ovens, Goulburn, and other rivers. It is a nectar and pollen producer like the other species.

The Swamp Bottlebrush (*Callistemon paludosus*).

A species with narrow, almost linear, leaves, and whitish or yellowish flowers, growing in swampy localities. No data as to its honey or pollen yielding qualities are so far available. Along water courses in the south, south-east, north-west, and north east.

The Mountain Bottlebrush (*Callistemon Sieberi*).

This is a mountain species with short, almost linear, leaves, from $\frac{1}{2}$ to $\frac{3}{4}$ of an inch in length, and red flowers, usually in short spikes. Found at Mount Wellington and Snowy River.

The Pine Bottlebrush (*Callistemon pithyoides*).

A tall shrub confined to the north-east of the State. The leaves are linear, more or less distinctly channelled on the upper side, rigid, blunt, or sharply pointed, from 2 to 4 inches long, resembling pine leaves, hence the name. The flowers are rather large and of a dull yellowish-green, including the anthers.

The Narrow-leaved Bottlebrush (*Callistemon linearis*).

Usually a tall shrub with narrow linear leaves, from 2 to 5 inches long, blunt or sharp-pointed. The flowers are large, with stamens about 1 inch long, dark or pale red, sometimes greenish

The Prickly Bottlebrush (*Callistemon brachyandrus*).

The Prickly Bottlebrush is a tall, stiff, bushy shrub or small tree, the young shoots softly hairy. The leaves are linear, channelled above, rigid, and sharply pointed, and from $\frac{3}{4}$ to $1\frac{1}{2}$ inches in length. The flower spikes are loose and interrupted, or sometimes dense, and rarely 2 inches in length. This species is found in the Murray Desert.

GRASS TREE (*Xanthorrhœa.*)

Erect, usually robust plants with narrow, very long, rigid, and comparatively thick leaves and upright flower spikes with numerous whitish flowers. There are three species, two of which are widely distributed over the State, while one, the Spear Grass Tree, is confined to the far east of Victoria.

Fig. 69.—Grass Tree.

SOUTHERN GRASS TREE (*Xanthorrhœa australis*).

Fig. 69.

This is the Common Grass Tree known by several local names such as Black Boys or Kangaroo Tails. It has a trunk like a fern tree, but with long, narrow, drooping blades or leaves. The usually solitary flower spike, which is sometimes up to 3 feet long is carried on a stout

upright stalk. Grass Trees furnish a resin soluble in alcohol, containing the base of picric acid. This resin, which exists in this species in considerable quantities, is very inflammable, and grass trees therefore burn fiercely, are however seldom killed by fire, and flower generally speaking, only after being burnt the previous season.

Bees gather the resin eagerly and use it as propolis for filling cracks and the spaces between the ends of the top bars of the frames and the hive wall. During cool weather this resin sets so hard and cementlike that the frames become almost unworkable, while, during warm temperatures, it adheres to everything coming in contact with it. Being soluble in alcohol it is however easily removed from the hands by methylated spirits or petrol.

The flower of the grass tree furnishes pollen to bees, and profusely secretes a very watery nectar, often neglected by bees, which when gathered produces a rank unpalatable honey. Except in seasons when no other nectar-yielding blossoms are available, grass-tree country should be avoided in locating apiaries on account of the trouble of the glueing together of everything in the hive and of the poor quality of the honey.

Spear Grass Tree (*Xanthorrhœa hastilis*).

This is confined to the far East, and up to the present nothing is known as to utility for bee-keeping.

Small Grass Tree (Bayonet Grass) (*Xanthorrhœa minor*).

Fig. 70.

The well-known, rough, tussocky grass, found on usually sour soil with a clay subsoil, all over the State, except in the North-East. Like the Grass Tree it flowers only after burning. The flower spike is smaller but often quite a number spring from the same plant. The leaves are unpalatable to animals, excepting the underground, soft, white portion, which, in times of food scarcity, is pulled out by kangaroos, scratched out by rabbits, and also eaten by stock when the tussocks are uprooted by the stock-owner, when forage is scarce.

The flower yields pollen, and is a valuable help to the bees in drought seasons when pollen is scarce. The nectar is watery, and sometimes secreted so freely that it can be shaken out of the blossom into the palm of the hand. Like the nectar of the Grass Tree it is sometimes neglected, possibly on account of the extreme dilution.

Small Grass Tree also contains resin, but as the base of the plant is underground and only accessible to bees when uprooted it does not cause trouble with propolis in bee-hives.

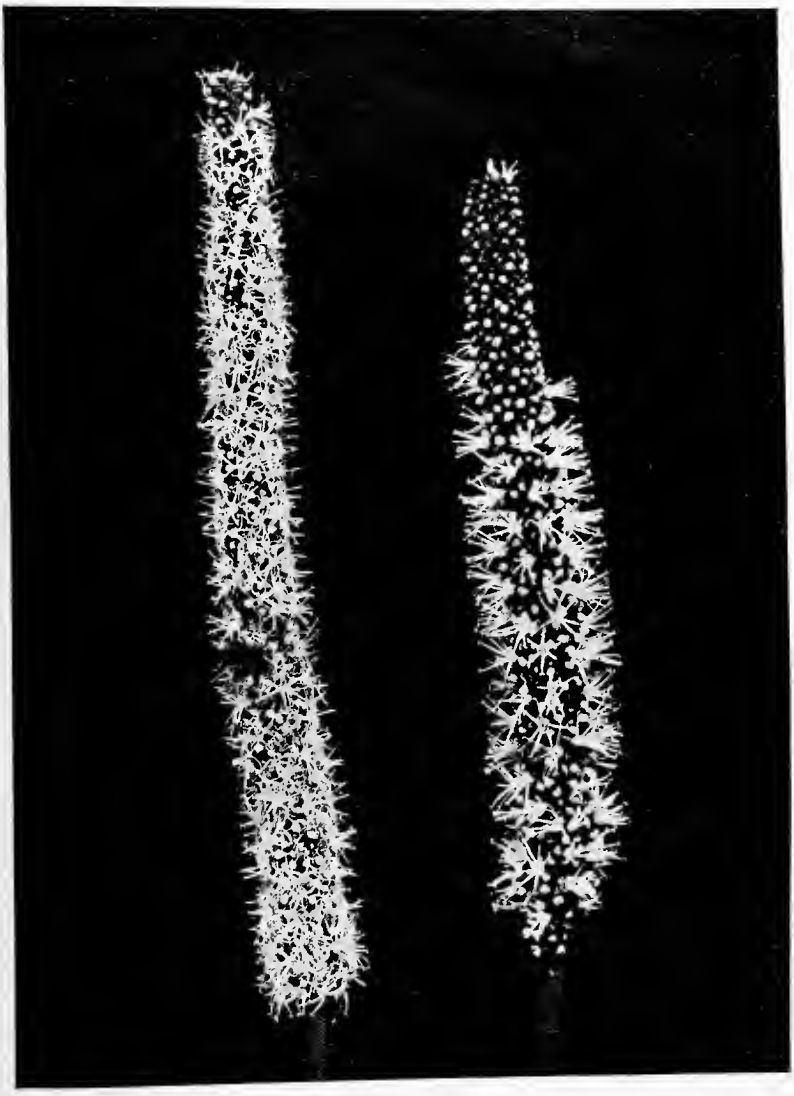


Fig. 70.—Bayonet Grass (*Xanthorrhœa minor*).

Index of Common Names.

(Pages of specific references are printed in **black** type—general references in lighter type.)

Eucalypts.

EUCALYPTS—*continued.*

EUCALYPTS—*continued.*

Plants other than Eucalypts.

Index of Botanical Names.

(Pages of specific references are printed in **black** type—general references in lighter type.)

Eucalypts.

Plants other than Eucalypts.

PLANTS OTHER THAN EUCALYPTS—*continued.*

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