

Eucalyptus

Botanical: *Eucalyptus globulus* (LABILLE.)

Family: N.O. Myrtaceae

Synonyms

Blue Gum Tree. Stringy Bark Tree.

Part Used

The oil of the leaves.

Habitat

Australia. Now North and South Africa, India, and Southern Europe.

The tree is indigenous with a few exceptions to Australia and Tasmania. The genus contains about 300 species and is one of the most characteristic genera of the Australian flora.

Description

The leaves are leathery in texture, hang obliquely or vertically, and are studded with glands containing a fragrant volatile oil. The flowers in bud are covered with a cup-like membrane (whence the name of the genus, derived from the Greek *eucalyptos* well-covered), which is thrown off as a lid when the flower expands. The fruit is surrounded by a woody, cupshaped receptacle and contains numerous minute seeds.

Eucalyptus trees are quick growers and many species reach a great height. *Eucalyptus amygdalin* (Labille) is the tallest known tree, specimens attaining as much as 480 feet, exceeding in height even the Californian Big Tree (*Sequoia gigantea*). Many species yield valuable timber, others oils, kino, etc.

There are a great number of species of Eucalyptus trees yielding essential oils, the foliage of some being more odorous than that of others, and the oils from the various species differing widely in character. It necessarily follows that the term Eucalyptus oil is meaningless from a scientific point of view unless the species from which it is derived is stated.

The Eucalyptus industry is becoming of economic importance to Australia, especially in New South Wales and Victoria. Many of the old species which give the oil of commerce have given way to other species which have been found to give larger yields or better oils. About twenty-five species are at the present time being utilized for their oil.

The oils may be roughly divided into three classes of commercial importance: (1) the *medicinal* oils, which contain substantial amounts of eucalyptol (also known as cineol); (2) the *industrial* oils, containing terpenes, which are used for flotation

purposes in mining operations; (3) the *aromatic* oils, such as *E. citriodora*, which are characterized by their aroma.

The British Pharmacopoeia describes Eucalyptus Oil as the oil distilled from the fresh leaves of *E. globulus* and other species.

E. globulus, the best-known variety (its name bestowed, it is said, by the French botanist De Labillardière, on account of the resemblance of its waxy fruit to a kind of button at that time worn in France), is the Blue Gum Tree of Victoria and Tasmania, where it attains a height of 375 feet, ranking as one of the largest trees in the world. It is also called the Fever Tree, being largely cultivated in unhealthy, low-lying or swampy districts for its antiseptic qualities.

The first leaves are broad, without stalks, of a shining whitish-green and are opposite and horizontal, but after four or five years these are succeeded by others of a more ensiform or sword-shaped form, 6 to 12 inches long, bluish-green in hue, which are alternate and vertical, i.e. with the edges turned towards the sky and earth, an arrangement more suited to the climate and productive of peculiar effects of light and shade. The flowers are single or in clusters, almost stalkless.

The Eucalyptus, especially *E. globulus*, has been successfully introduced into the south of Europe, Algeria, Egypt, Tahiti, South Africa and India, and has been extensively planted in California and also, with the object of lessening liability to droughts, along the line of the Central Pacific Railway.

It thrives in any situation, having a mean annual temperature not below 60 degrees F., but will not endure a temperature of less than 27 degrees F., and although many species of Eucalyptus will flourish out-of-doors in the south of England, they are generally grown, in this country, in pots as greenhouse plants.

It was Baron Ferdinand von Müller, the German botanist and explorer (from 1857 to 1873 Director of the Botanical Gardens in Melbourne), who made the qualities of this Eucalyptus known all over the world, and so led to its introduction into Europe, North and South Africa, California and the non-tropical districts of South America. He was the first to suggest that the perfume of the leaves resembling that of Cajaput oil, might be of use as a disinfectant in fever districts, a suggestion which has been justified by the results of the careful examination to which the Eucalyptus has been subjected since its employment in medicine. Some seeds, having been sent to France in 1857, were planted in Algiers and thrived exceedingly well. Trottoir, the botanical superintendent, found that the value of the fragrant antiseptic exhalations of the leaves in fever or marshy districts was far exceeded by the amazingly powerful drying action of the roots on the soil. Five years after planting the Eucalyptus, one of the most marshy and unhealthy districts of Algiers was converted into one of the healthiest and driest. As a result, the rapidly growing Eucalyptus trees are now largely cultivated in many temperate regions with the view of preventing malarial fevers. A noteworthy instance of this is the monastery of St. Paolo à la tre Fontana, situated in one of the most fever-stricken districts of the Roman Campagna. Since about 1870, when the tree was planted in its cloisters, it has become habitable throughout the year. To the remarkable drainage afforded by its roots is also ascribed the gradual disappearance of

mosquitoes in the neighbourhood of plantations of this tree, as at Lake Fezara in Algeria.

In Sicily, also, it is being extensively planted to combat malaria, on account of its property of absorbing large quantities of water from the soil. Recent investigations have shown that Sicilian Eucalyptus oil obtained from leaves during the flowering period can compete favourably with the Australian oil in regard to its industrial and therapeutic applications. Oil has also been distilled in Spain from the leaves of *E. globulus*, grown there.

In India, considerable plantations of *E. globulus* were made in 1863 in the Nilgiris at Ootacamund, but though a certain amount of oil is distilled there locally, under simple conditions, little attempt has hitherto been made to develop the industry on a commercial scale, Australia remaining the source of supply.

A great increase in Eucalyptus cultivation has recently taken place in Brazil as a result of a decree published in 1919 awarding premiums and free grants of land to planters of Eucalyptus and other trees of recognized value for essence cultivation.

Constituents

The essential Oil of Eucalyptus used in medicine is obtained by aqueous distillation of the fresh leaves. It is a colourless or straw-coloured fluid when properly prepared, with a characteristic odour and taste, soluble in its own weight of alcohol. The most important constituent is Eucalyptol, present in *E. globulus* up to 70 per cent of its volume. It consists chiefly of a terpene and a cymene. Eucalyptus Oil contains also, after exposure to the air, a crystallizable resin, derived from Eucalyptol.

The British Pharmacopoeia requires Eucalyptus Oil to contain not less than 55 per cent, by volume, of Eucalyptol, to have a specific gravity 0.910 to 0.930 and optical rotation -10 degrees to 10 degrees. The official method for the determination of the Eucalyptol depends on the conversion of this body into a crystalline phosphate, but numerous other methods have been suggested (see Parry, *Essential Oils*,

A small amount of medicinal oil is still distilled from *E. globulus*, but Its odour is less agreeable than those of many others. Today, *E. polybractea* (Silver Malee Scrub which is cultivated and the oil distilled near Bendigo in Victoria), containing 85 per cent of Eucalyptol, and *E. Smithii* (Gully Ash) are favourites for distillation. Among others frequently employed, *E. Australiana* yields a valuable medicinal oil and also *E. Bakeri*, a large shrub or pendulous willow-like tree, about 30 to 50 feet high, with very narrow leaves, found from northern New South Wales to central Queensland, known locally as the 'Malee Box.' The oil from this species is of a bright reddish-yellow and contains 70 to 77 per cent of Eucalyptol and other aromatic substances identical with those found in *E. polybractea*.

The oil used for flotation purposes in the extraction of ores is known as that of *E. amygdalina*, and is probably derived from this tree as well as from *E. dives*. It is an oil containing little Eucalyptol and having a specific gravity from 0.866 to 0.885, and an optical rotation -59 to -75 degrees, its chief constituent is phellandrene, which forms a crystalline nitrate and is very irritating when inhaled. There is a considerable demand

in New South Wales for the cheap phellandrene Eucalyptus oils for use in the mining industry in the separation of metallic sulphides from ores.

Of the perfume-bearing oils, that of *E. citriodora*, the CITRON-SCENTED GUM, whose leaves emit a delightful lemon scent, contains up to 98 per cent of citronellol and is much used in perfumery, fetching four times as much as the medicinal oils. *E. Macarthurii* ('Paddy River Box') contains up to 75 per cent of geranyl acetate, and as a source of geraniol this tree would probably repay cultivation: it is now receiving special attention in Australia, as it is a very rapid grower. *E. odorata* yields also an odorous oil used by soapmakers in Australia. *E. Staigeriana*, the Lemon-scented Iron Bark, has also a very pleasing scent, and the fragrance of the leaves of *E. Sturtiana* is similar to that of ripe apples.

There are a number of Eucalypts which contain a ketone known as piperitone, such as *E. piperita*. This body can be used in the synthesis of menthol, but it remains to be seen whether the process can be made a commercial success. *E. dives* (Peppermint Gum) and *E. radiata* (White Top Peppermint) yield oils with a strong peppermint flavour.

Details of an enormous number of the oils of Eucalyptus can be found in *A Research on the Eucalypts*, by Baker and Smith.

Medicinal Action and Uses

Stimulant, antiseptic, aromatic.

The medicinal Eucalyptus Oil is probably the most powerful antiseptic of its class, especially when it is old, as ozone is formed in it on exposure to the air. It has decided disinfectant action, destroying the lower forms of life. Internally, it has the typical actions of a volatile oil in a marked degree.

Eucalyptus Oil is used as a stimulant and antiseptic gargle. Locally applied, it impairs sensibility. It increases cardiac action.

Its antiseptic properties confer some antimalarial action, though it cannot take the place of Cinchona.

An emulsion made by shaking up equal parts of the oil and powdered gum-arabic with water has been used as a urethral injection, and has also been given internally in drachm doses in pulmonary tuberculosis and other microbic diseases of the lungs and bronchitis.

In croup and spasmodic throat troubles, the oil may be freely applied externally.

The oil is an ingredient of 'catheder oil,' used for sterilizing and lubricating urethral catheters.

In large doses, it acts as an irritant to the kidneys, by which it is largely excreted, and as a marked nervous depressant ultimately arresting respiration by its action on the medullary centre.

For some years Eucalyptus-chloroform was employed as one of the remedies in the tropics for hookworm, but it has now been almost universally abandoned as an inefficient anthelmintic, Chenopodium Oil having become the recognized remedy.

In veterinary practice, Eucalyptus Oil is administered to horses in influenza, to dogs in distemper, to all animals in septicaemia. It is also used for parasitic skin affections.

Preparations

The dose of the oil is 1/2 to 3 minims. Eucalyptol may be given in similar doses and is preferable for purposes of inhalation, for asthma, diphtheria, sore throat, etc.

As a local application for ulcers and sores, 1 OZ. of the oil is added to 1 pint of lukewarm water. For local injections, 1/2 OZ. to the pint is taken.

The Fluid Extract is used internally, the dose 1/2 to 1 drachm, in scarlet fever, typhoid and intermittent fever.

Eucalyptol, U.S.P.: dose, 5 drops. Ointment, B.P.

Other Species

EUCALYPTUS GUM or KINO

E. nostrata and some other species of Eucalyptus yield Eucalyptus or Red Gum, a ruby-coloured exudation from the bark (to be distinguished from Botany Bay Kino).

Red Gum is a very powerful astringent and is given internally in doses of 2 to 5 grains in cases of diarrhoea and pharyngeal inflammations. It is prepared in the form of tinctures, syrups, lozenges, etc.

Red Gum is official in Great Britain, being imported from Australia, though the Kino generally employed here as the official drug is derived from *Pterocarpus Marsupium*, a member of the order Leguminosae, East Indian, or Malabar Kino, and is administered in doses of 5 to 20 grains powdered, or 1/2 to 1 drachm of the tincture.

In veterinary practice, Red Gum is occasionally prescribed for diarrhoea in dogs and is used for superficial wounds.

E. globulus, *E. resinifera* and other species yield what is known as Botany Bay Kino, an astringent, dark-reddish, amorphous resin, which is obtained in a semi-fluid state by making incisions in the trunk of the tree and is used for similar purposes

J. H. Maiden (*Useful Native Plants of Australia*, 1889) enumerates more than thirty species as Kino-yielding.

MANNA

From the leaves and young bark of *E. mannifera*, *E. viminalis*, *E. Gunnii*, var. *rubida*, *E. pulverulenta*, etc., a hard, opaque sweet substance is procured, containing melitose. The Lerp Manna of Australia is, however, of animal origin. See KINOS.

TWO EUCALYPTUS OINTMENTS

Compound Resin Ointment, B.P.C. Resin 20; Oil of Eucalyptus by weight, 15; Hard paraffin, 10; Soft paraffin, 55.

Eucalyptus Ointment (Benn's *Botanic Doctor's Adviser*). Elder Oil, 12 OZ.; White Wax, 2 OZ.; Spermaceti, 1 1/2 oz.; Eucalyptus Oil, 2 drachms; Wintergreen Oil, 20 drops.

A good ointment for the skin, containing antiseptic and healing properties. It produces very satisfactory results in scurf, chapped hands, chafes, dandruff, tender feet, enlargements of the glands, spots on the chest, arms, back and legs, pains in the joints and muscles.

Apply a piece of clean cotton or lint to wounds after all dirt is washed away. For aches and pains rub the part affected well and then cover with lint. Repeat two or three times, taking a blood-purifying mixture at the same time.