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Ethnomedical uses of Eucalyptus: A review

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Abstract
Eucalyptus belongs to the Myrtaceae family under which there are 900 species and subspecies present. After Acacia it is the largest genera. In more than 90 countries it is grown today. There are various species of Eucalyptus species whose oil when applied in unessential herbs or weed kills them.

Keywords: Eucalyptus, herbal, diabetes

Introduction
Eucalyptus is an evergreen tall tree first discovered from Australia and Tasmania. Eucalyptus belongs to the Myrtaceae family under which there are 900 species and subspecies present. After Acacia it is the largest genera. In more than 90 countries it is grown today [1]. The oil extract from the different parts of the plant (leaves, fruits, buds and bark) shows antibacterial, antiseptic, antioxidant, anti-inflammatory, anticancer activity. Due to presence of these properties this is used for treatment of respiratory disease, common cold, influenza, sinus and congestion. The widely used species is *E. globulus* due to its various propose of uses like perfume, cosmetics, food, beverages, aromatherapy, and phytotherapy.
It has many Indian names, depending on the geographical region or the language, for example: *Eucalyptus globulus* (Latin name), Tail Parn, Sugandh Patra (Sanskrit name), Gum Tree, Gum Eucalypt (English), Neelgir (Hindi), Nilgiri (Kannad), Harit Parn (Gujrati) [2].

Morphology
The flower in buds are covered with a cup-like member (hence the name of the genus, derived from the Greek eucalyptus well covered), which is thrown off as a lid when the flower expands. The fruit is surrounded by a woody, cup shaped receptacle and contains numerous minutes' seeds. 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 other of a more 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, and arrangement more suited to the climate and productive of peculiar of light and shade. The flower is single or in cluster, almost stalkless. An adult eucalyptus may take the form of a low shrub or a very large tree. There are three main behaviours that species can divide into [3].

1. Woodland trees are single-stemmed even have a crown from a minor amount of the whole tree height.
2. Woodland trees are singled-stemmed even though they may branch at a small space above ground level.
3. Mallees are multi-stemmed from position level, usually less than 10 m (33 ft) in height. Tree sizes follow the convention of:

Small- to 10 m (33 ft) in height
Medium-sized- 10-30 m (33-98 ft)
Tall- 30-60m (98-197 ft.)
Very tall- over 60 m (200 ft)

Properties
Agronomic properties of Eucalyptus
Eucalyptus tree has properties like fast growth, straight form, valuable wood properties, and wide adoptability to soil and climate and at last but not the least easy management due to

presence of those properties Eucalyptus species become an important hardwood for the pulp industries. Beside this these woods are also used for smooth writing and printing paper, as these contain many small fibers, and these are smaller than other hardwood. From all this it is said that the pulpability factor of the Eucalyptus is better than other than hardwood species. Eucalyptus oil has many commercial uses such as perfume, cosmetics, food, beverages, aromatherapy and phytotherapy in large scale in many countries its oil has some magical properties which is used for different propose like antibacterial, antiseptic, antioxidant, anti-inflammatory and anticancer activity. As seen mostly on water logging areas many farmers plant this tree and earn money. Due to shortage of popular wood in the world, the Eucalyptus is used in the furniture industries. The charcoal is one of the most essential renewable energy sources in the world. The charcoal of the Eucalyptus plant is very efficient because it provides more energy than the other hardwood charcoal. As the Eucalyptus plant are very tall in nature in some places these are use as electric poles [4].

Eucalyptus oil use as herbicide

There are various species of Eucalyptus species whose oil when applied in unessential herbs or weed kills them. It is reported that the species such as *E. citriodora* and *E. tereticornis* oil when applied in Parthenium hysterophorus in the form of vapours decrease their germination. Further this experiment was conducted in *Raphanus sativus*, *Amaranthus viridis*, *Zea mays* etc. the essential oil is more effective on A. viridis because of its small size comparing to R. sativus because of its larger seed. *E. citriodora* oil is more toxic than *E. tereticornis*. Fumigation is the process of using gases to destroy the unwanted pests in the plant. Here fumigation using Eucalyptus oil is done which result in plant destruction by chlorosis, decreased cellular respiration, necrosis. The secondary metabolites oil such as phenolics, tannins, and monoterpenes contribute herbicidal activities. On different concentration oil was sprayed: Less than 50 microliter/ ml- the toxicity was less, and reversible reaction took place. More than 50 microliter/ml- the condition was not much improved but more than 100 microliter/ml-with the passage of time wilting of leaves took place [5].

Eucalyptus oil use as insecticides

Insects damage the plants by chewing the leaves, sucking plant juices, secretion of toxic substances on shoot of the plant, create holes in the leaves which lead to poor growth of the plant not only that they also destroy the natural wooden fibers. There are so many insects found in this world but only one out of three cause damage to the plant. These are insects such as gall mites, bagworm, leaf minor, moth, aphids, flies, mosquitoes, earwig, grasshopper etc. they cause more damage to the plant. Instead of harmful insecticides we can use Eucalyptus oil which is a natural insecticide [6].

Table 1: Major species [7, 8]

Major species of Eucalyptus	Major species of Eucalyptus
Eucalyptus amygdalina	*Eucalyptus microtheca*
Eucalyptus australiana	*Eucalyptus nitens*
Eucalyptus botryoides	*Eucalyptus ovate*
Eucalyptus calophylla	*Eucalyptus pauciflora*
Eucalyptus camaldulensis	*Eucalyptus perriniana*
Eucalyptus citriodora.	*Eucalyptus pilularis*
Eucalyptus cladocalyx	*Eucalyptus polyanthemos*
Eucalyptus consideniana	*Eucalyptus polybractea*
Eucalyptus cypellocarpa.	*Eucalyptus populnea*
Eucalyptus dives	*Eucalyptus radiate*
Eucalyptus gigantean	*Eucalyptus regnans*
Eucalyptus globulus	*Eucalyptus risdonni*
Eucalyptus gomphocephala	*Eucalyptus robusta*
Eucalyptus grandis	*Eucalyptus rossi*
Eucalyptus gunnii	*Eucalyptus rostrata*
Eucalyptus incrassate	*Eucalyptus saligna*
Eucalyptus kino	*Eucalyptus sideroxylon*
Eucalyptus largeflorens	*Eucalyptus sieberiana*
Eucalyptus lesouefii	*Eucalyptus smithii*
Eucalyptus macrocarpa	*Eucalyptus tereticornis*
Eucalyptus macrorhyncha	*Eucalyptus tetrodonta*
Eucalyptus maculate	*Eucalyptus umbra*
Eucalyptus marginata	*Eucalyptus urophylla*
Eucalyptus melanophloia	*Eucalyptus viminalis*
Eucalyptus melliodora	*Eucalyptus wandoo*

Eucalyptus oil can also be used to treat different kinds of disease such as:

Bronchitis

Certain factors such as smoking, air pollution can lead to inflammation in the lining of the bronchial tube which causes bronchitis. Eucalyptus oil has the ability to curtail bacterial actions by acting as an efflux pump inhibitor which enhances our immune system to control the growth of bacterial species responsible for bronchitis. Sinus: Inflammation in nasal passage and surroundings of cavity can triggered by allergies which can be prevented by Eucalyptus oil. Eucalyptus oil can be used as a spray which can address the pain and inflammation caused by allergic reaction or any bacterial action. Compounds present in Eucalyptus oil can soothe mucus membrane in the case of any infection or and medical conditions such as allergies [9].

Asthma

It is a condition which makes a person difficult to breathe by

extensive chest pain and coughing which occurs due to inflammation or production of extra mucus which can block nasal passage. For many years Eucalyptus oil has been used in various medicines such as Vicks VapoRub which can heal coughing making it easier for the person to breathe [10].

Antiseptic activity
Eucalyptus Oil is one of the most powerful antiseptic agents as it contains certain compounds such as 1, 8-cineole and citronellyl acetate which can cleave bacterial cell wall as well as bacterial DNA. According to many researchers the age of Eucalyptus oil is an essential factor as when it is old, ozone formation occurs due to direct explosion to the air which makes it a better antiseptic agent [11].

Antimicrobial activity
Eucalyptus Oil holds antibacterial effect against various pathogenic microorganisms such as of *Klebsiella* spp., *Proteus* spp., *Pseudomonas* spp., *Escherichia* coli, and *Staphylococcus* aureus. Antimicrobial activity of Eucalyptus oil depends upon the concentration of oil used against a specific microorganism. One of the easiest methods to examine antimicrobial activity is MIC assay. The minimum Inhibitory Concentration assay is used to analyze the minimum dose required to kill bacteria. Such as only 5 µl is capable of controlling the growth of *Escherichia coli* and *Klebsiella* spp. and in the case of *Staphylococcus aureus* only 25 µl of oil is required to curtain its functionality. Whereas the growth of Pseudomonas and Proteus spp. can be inhibited by 50 µl of Eucalyptus oil [12].

Antiviral
Twelve euglobals from Eucalyptus globules & their twenty-six related compounds were examined for their inhibitory effects on Epstein-Barr virus activation by a short-term *in vitro* assay. The results showed the most of the euglobals having monoterpene structures, & euglobal-III had strong inhibitory activity. Grandinol, homograndinols showed stronger inhibitory effects [13].

Antifungal activities
Eucalyptus oil is often use for the treatment of facial demodicidosis which is a disease caused by Dematatious fungi which invades sebaceous glands areas of the skin causing dryness, redness rash and sometimes erythema. Eucalyptus oil extracted from Eucalyptus globulus with mildly diluted glycerol can completely cure facial demodicidosis. Another fungi Malassezia furfur which is a causative agent of seborrheic dermatitis and tinea versicolor can also be treated using oil extracted from Eucalyptus globulus leaves [14].

Anti-inflammatory
1, 8-cineole, major constituents present in violate oil of Eucalyptus airway inflammation in bronchial asthma and other steroid-sensitive disorders.

Antitumor
Antitumor-promoting activity of Euglobals Ia1, Ia2, Ib, Ic, IIa, IIb, IIc, III, IVa, IVb, and V and VII was tested *in vitro* on 12-O-tetradecanoylphorbol-13-acetate (TPA)-induced EpsteinBarr virus early antigen (EBV-EA) activation test system. Euglobal-III showed strong inhibitory activity, followed by euglobals Ib, IIa, Ic, Ia1, Ia2. Eucalyptus globulus oil inhibits the nuclear translocation of NF-kappa B induced by LPS in THP-1 cells [15].

Antidiabetic
Eucalyptus globulus is used as traditional treatment for diabetes. In this study, incorporation of Eucalyptus in the diet (62.5g/kg) & drinking water (2.5g/L) reduced the hyperglycemia & associated weight loss of steptozotocin-treates mice. An aqueous extract of Eucalyptus (AEE) (0.5g/L) enhanced 2-deoxy-glucose transport by 50%, glucose oxidation by 60% & incorporation of glucose into glycogen by 90% in mouse abdominal muscle. In acute, 20 min incubations, 0.25-0.5g AEE/L evoked a stepwise 70-160% enhancement of insulin secretion from the clonal pancreatic beta-cell line (BRIN-BD11). These data indicate that Eucalyptus globulus represents an effective antihyperglycemic dietary adjunct for the treatment of diabetes and a potential source for discovery of new orally active agent for future therapy [16].

Intestinal fructose
Absorption Inhibition Eucalyptus globulus leaf extract inhibits intestinal fructose absorption, & suppresses adiposity due to dietary sucrose in rats.

Hepatoprotective
Ursolic acid isolated from the leaves of Eucalyptus hybrid E. tereticomis showed a dose dependent (5-20 mg/kg) hepatoprotective activity (21-100%) in rats against thioacetamide, galactosamine and carbon tetrachloride induced hepatotoxicity in rats [17].

Conclusion
Authors found that Eucalyptus have various ethno medical properties and suggest that more scientific research should be done on it, which should include chemical analysis, drug development and clinical research.

References

1. Dixit Arti, Rohilla Ankur, Singh Vijender. Review Article Eucalyptus globulus: A New Perspective in Therapeutics. International Journal of Pharmaceutical & Chemical Sciences 2012;1(4):1678-1683.
2. Nagpal N, Shah G, Arora MN *et al*. Phytochemical & Pharmacological Aspects of Eucalyptus Genus, International Journal of Pharmaceutical & Research 2010;1(12):28-36.
3. Ikawati Z, Wahyuono S, Maeyama K. Screening of several Indonesian medicinal plants for their inhibitory effect on histamine release from RBL-2H3 cells J Ethnopharmacol 2001;75:249-256.
4. Takasaki M, Konoshima T, Fujitani K, Yoshida S, Nishimura H, Tokuda H *et al*. Inhibitors of skin-tumor promotion. VIII. Inhibitory effects of euglobals & their related compounds on Epstein-Barr virus activation. Chem. Pharm Bull 1990;38:2737-2739.
5. Zhou JY, Tang FD, Mao GG, Shao J, Wang Y, Bian RL. Effect of *Eucalyptus globulus* oil on activation of nuclear factor-kappa B in THP-1 cells. Zhejiang Da Xue Xue Bao Yi Xue Ban 2003;32:315-318.
6. Vijaykumar R, Muthukumar C, Kumar T, Saravanamuthu R. Characterization of Malassezia furfur and its control by using plant extracts. Indian J Dermatol 2006;51:145-148.
7. Sato S, Yoshinuma N, Ito K, Tokumoto T, Takiguchi T, Suzuk Y *et al*. The inhibitory effect of funoran &

eucalyptus extract-containing chewing gum on plaque formation. J Oral Sci 1998;40:115-157.
8. Unger M. Frank A. Simultaneous determination of the inhibitory potency of herbal extracts on the activity of six major cytochrome P450 enzymes using liquid chromatography/mass spectrometry and automated outline extraction. Rapid. Commun. Mass. Spectrom 2004;18:2273-2281.
9. Monzon RB, Alvior JP, Luczon LL, Morales AS. Mutuc FE. Larvicidal potential of five Philippine plants against *Aedes aegypti* (Linnaeus) and *Culex quinquefasciatus* (Say). Southeast Asian J Trop. Med. Public Health 1994;25:755-759.
10. Moreira MR, Cruz GMP, Lopes MS, Albuquerque AAC, Leal-Cardoso JH. Effects of terpineol on the compound action potential of the rat sciatic nerve. Brazilian Journal of Medical & Biological Research 2001;34:1337- 1340.
11. Takasaki M, Konoshima T, Fujitani K, Yoshida S, Nishimura H, Tokuda H *et al*. Inhibitors of skin-tumor promotion. VIII. Inhibitory effects of euglobals & their related compounds on Epstein-Barr virus activation. Chem. Pharm Bull 1990;38:2737-2739.
12. Osawa K, Yasuda H, Morita H, Takeya K, Itokawa H, Macrocarpals HI. J from the Leaves of Eucalyptus globulus. J Nat. Prod 1996;59:823-827.
13. Gray AM, Flatt PR. Anti-hyperglycemic actions of *Eucalyptus globulus* (Eucalyptus) are associated with pancreatic and extra-pancreatic effects in mice. J Nutr 1998;128:2319-2323.
14. Takasaki M, Konoshima T, Fujitani K, Yoshida S, Nishimura H *et al*. Inhibitors of skin-tumor promotion. VIII. Inhibitory effects of euglobals & their related compounds on Epstein-Barr virus activation. Chem. Pharm Bull 1990;38:2737-2739.
15. Sugimoto K, Suzuki J, Nakagawa K, Hayashi S, Enomoto T, Fujita T *et al*. Eucalyptus leaf extracts inhibits intestinal fructose absorption, & suppresses adiposity due to dietary sucrose in rats. Br. J Nutr 2005;93:957-963.
16. Villasenor IM, Lamadrid MR. Comparative anti-hyperglycemic potentials of medicinal plants. J Ethnopharmacol 2006;104:129-131.
17. Saraswat B, Visen PK, Agarwal DP. Ursolic acid isolated from *Eucalyptus tereticornis* protects against ethanol toxicity in isolated rat hepatocytes. Phytother. Res 2000;14:163-166.