Eucalyptus Globulus: A Credible Source of Medicinal Boon

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Abstract

The aim of our study is to compile and evaluate the medicinal properties of *Eucalyptus globules. Eucalyptus* is used as a traditional medicine in various countries like India, Italy and some African countries. Our study shows that essential oils and extracts of leaves, wood, stump, root and fruits of *Eucalyptus* possess various medicinal effects including antifungal, antibacterial, antidiabetic, anthelmintic, anticancer, antiviral, anti-inflammatory, antioxidant, protection against UV-B and wound healing effect. The essential oil of this plant also reveals the important role in therapeutic, aromatic and cosmetic uses.

Keywords: Eucalyptus, Medicine, Essential oils, Plant extract, Healing effect.

INTRODUCTION

The flowering tree *Eucalyptus globulus* is a member of the Myrtle family (Myrtaceae). Over the course of human history, it has been utilised for thousands of years. Over 700 species and variants of eucalyptus have been successfully introduced throughout the world. Many nations, including Italy, India, and several African nations, employ it as a traditional medicine (**Guarrera *et al*., 1999; Luis, A., *et al*. 2014).** With a long history of use, *Eucalyptus globulus* Labill has many ethnobotanical and ethnomedicinal applications. Around the world, various components of this aromatic and medicinal plant are used to cure various ailments and symptoms. Remarkable accounts exist regarding the ethnomedical uses of *E. globulus* in Asian nations (**Abouri *et al*., 2012**). In many ethnomedical practices around the world, *E. globulus* is most commonly used traditionally to treat skin conditions, rheumatism, diabetes, malaria, respiratory system disorders, and other conditions. It is also used as an analgesic and antiseptic (**Dhakad *et al*., 2018).**

Ethnobotany of the plant

E. globulus has long been used to cure a wide range of ailments in many parts of the African continent. It is used to treat illnesses of the respiratory system in Algeria **(Sivasankari, *et al*., 2014].** *E. globulus* is known as "Bishiyarturare" in Nigeria, where its leaves is used as a mouthwash, nasal congestion reliever, and wound dressing. Moreover, jaundice and malaria are treated using its leaf (**Abubakar *et al*., 2017).** *E. globulus* is referred to as "Kalatos" in traditional Moroccan medicine, and it has been suggested to cure a number of respiratory disorders. Its leaf is advised for diabetic patients in Eritrea and Morocco **(Abouri *et al*., 2012).** As a result, the plant has several applications and can be used in every scenario.

Antifungal: According to studies by **Císarová *et al*. (2016)** and **Sharma *et al*. (2017**), the EOs of *E. globulus* have been shown to have an antifungal impact on Candida albicans, Aspergillus fumigatus, Saccharomyces cerevisiae, and Fusarium oxysporum. Additionally, eucalyptus leaves demonstrated antifungal action against Candida albicans, Aspergillus flavus, Aspergillus niger, Rhizoctonia solani,

Trichophyton mentagrophytes, and Saccharomyces cerevisiae. The stump of *E. globulus* had antifungal action against Candida albicans, as demonstrated by **Luis, A., *et al*. (2014).**

Antibacterial: Numerous investigations assessed E. globulus's antibacterial properties against both gram-positive and gram-negative bacteria. The antibacterial activity of eucalyptus leaf extract, according to **Ait-Ouazzou *et al*. (2011),** may be caused by the predominance of 1,8-cineole (Compound 64), limonene (Compound 63), p-cymene (Compound 62), and γ-terpinene (Compound 58) in Eos (16). The remarkable antibacterial activity of eucalyptus stumps, as shown by Luis *et al*. (2014), may be attributed to their high flavonoid and phenolic compound content when compared to wood and stump bark. According to **Mulyaningsih, S., *et al*. (2016),** aromadendrene (Compound 42) is most likely the cause of the antibacterial activity of *E. globulus* fruits.

Anti-cancer: In vitro, *Eucalyptus globulus* slowed the growth of cell lines related to the colon, cervix, nueroblastoma, ovarian, lung, liver, breast, Hella, and stomach. Colon cell lines were used to study the anticancer potential of 1,8-cineole both in vitro and in vivo as discussed by **Bhatt *et al*. (2011).** Western blotting studies conducted in a laboratory setting were used to identify the mechanism of 1,8-cineole-induced apoptosis in colorectal cell lines. The results indicated that 1,8-cineole inactivated survivin and Akt and activated p38, thereby initiating a cascade that causes apoptosis in colon cell lines.

Antidiabetic: Several studies demonstrated E. globulus's antidiabetic properties. For instance, insulin secretion was reduced in the mouse abdominal muscle in vitro following the formation of diabetes by streptozocin (STZ) in mouse cells, according to **Grey, A.M., *et al*. (1998).** When *E. globulus* was added to the drinking water and diet of mice with diabetes, insulin production, glucose oxidation, and the transportation of 2-deoxy-glucose—an analogue of glucose—was all gradually elevated. Additionally, it has been demonstrated that *E. globulus* accelerated the conversion of glucose to glycogen, which may help to lower high plasma glucose levels in diabetics.

Anthelmintic: Numerous researches have indicated the anthelmintic effect that *Eucalyptus globulus* showed. **Dhkad, A.K., *et al*. (2018),** for instance, hypothesised that the presence of borneol (Compound 95), linalool (Compound 31), cineole (Compound 64), geranyl acetate (Compound 98), anethole (Compound 99), and saffrol (Compound 100) in EOs may be the source of the in vitro anthelmintic impact of E. globulus.

Antiviral: Brezáni, V., *et al*. (2018) demonstrated E. globulus's antiviral activity against HSV-1 and HSV-2 antigen replication by the use of the neutral red dye-uptake method. However, it was demonstrated by **Cermelli, C., *et al*. (2008**) that *E. globulus* had an antiviral effect against the mumps.

Anti-inflammatory: In Europe, *Eucalyptus globulus* has long been used as a traditional remedy for inflammatory conditions like gout, diabetes, arthritis, and asthma. According to some research, eucalyptus can prevent the activation of the inflammasome and lower the levels of TNF-α, IL-6, and IL-1β when tested in various cell lines (**Hasegawa *et al*., 2008; Juergens *et al*., 1998).**

Protection against UV-B: According to **Park *et al*. (2018),** *E. globulus* inhibited the production of MMP and IL-6 on normal human skin fibroblasts following UVB irradiation. Additionally, compared to non-UVB irradiated fibroblasts, UVB irradiated cells showed increased TGF-β1 expression and procollagen type 1.

Essential oil: The larvae of Lutzomyia longioalpis were significantly impacted by the essential oil of E. globulus. Compared to eggs and adults, eucalyptus was more effective on larvae. On adult Acanthoscelides obtectus, *E. globulus* oil exhibited a substantial insecticidal impact; however, the lethal dose varies depending on the insect's sex and the essential oil's constituent (**Papachristos, D.P., *et al*., 2004).**

CONCLUSION

In traditional medicine, *Eucalyptus globulus* was utilised in various areas to cure various ailments. We have examined the phytochemical, ethnobotanical, and medicinal profiles of the various *E. globulus* components. Numerous pharmacological properties of *E. globulus* have been demonstrated by a number of in vitro investigations as well as certain experimental or clinical research. Overall, this publication suggests that *E. globulus* has significant potential for use in pharmaceutical research, particularly for usage as an anti-inflammatory and antibacterial drug. To assess the possible uses of *E. globulus* as an alternative in the treatment of microbiological, cardiovascular, gastrointestinal, dermatological, and neurological diseases, more clinical research is advised.

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