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BIOACTIVITY OF EUCALYPTUS ESSENTIAL OIL

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Abstract - *Eucalyptus* plant belongs to myrtaceae family, it commonly known as eucalyptus. In line with worldwide, it's worldwide cultivated plant. Eucalyptus plant parts has various and different bioactivities. The main chemical components of eucalyptus plant is 1, 8 cineole. It has very strong medicinal properties. And other major chemical components are limonene, α-pinene, P-Cymene, Terpine-1-ol, Globulol. Eucalyptus essential oil has strong bioactivities like antifungal, antibacterial, antioxidant, and antimycotoxigenic activities. Eucalyptus essential oil also has preservative properties. A review provides an overview of the current literature on eucalyptus essential oils mainly antifungal, antimycotoxigenic activity and their uses.

Keywords: chemical preservative, eucalyptus essential oil

I. INTRODUCTION

Eucalyptus, it's an outsized genus of quite 660 species of shrub and trees of the myrtaceae family [1]. *Eucalyptus* plant parts are having bark, leaves, flower, fruits within which they're use in numerous bio-activities. Consistent with worldwide, eucalyptus tree is that the principle of source of eucalyptus oil. Blue gum essential oils also know as volatile aromatic oil [2].

Essential oils are extracted from plants for clinically purposes became a important topics in research and industrial application likely it have some selected chemical component like 1, 8-cineole (aka cineole and eucalyptol) could be a key one component and other natural. Eucalyptol has been shown to own strong antibacterial [3], antiviral, antioxidant [4], anti-fungal action, anti-inflammatory [5]. Though the volatile oil remains recommended today for a bunch of medicinal applications, its primary use remains the treatment of cough, cold, bronchitis, and symptomatic relief of colds and congestion of the upper tract. It have some selected chemical component like 1, 8-cineole (aka cineole and eucalyptol) may be a key one component and other natural.

Eucalyptus essential oil has been approved as food additive. And plant extract also employed in pharmaceutical and cosmetic industries [13]. The oil possesses widely bioactivities it including antimicrobial, fungicidal, insecticidal, herbicidal, etc.

Table-1: General data

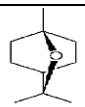
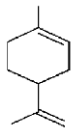
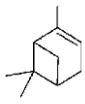
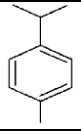
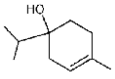
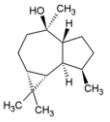
Plant name	**Eucalyptus plant**
Common name	Eucalyptus, blue gum, Tasmanian blue gum, southern blue gum
Scientific name	*Eucalyptus globulus*
Plant type	Tree
Native region	Australia
Main producers	China
Main economic use	Medicinal, cattle forage, cosmetics, living fence, timber industry
Plant life style	Perennial
Main consumed part	Leaves
Growing habitat	Sub tropical region

(General data of *Eucalyptus globulus* plants)

II. PHYTOCHEMICALS

Eucalyptus oil has light yellowish colour oil and it has aromatic odour. The main component is 1,8-cineole and other major chemical components are limonene, α-pinene, P-Cymene, Terpine-1-ol, Globulol.[10]

Table-2 phytochemicals structure

Chemical components	**Structure**
1,8-cineole	
limonene	
α-pinene	
P-Cymene	
Terpine-1-ol	
Globulol	

Chemical components

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III. BIOACTIVITY OF EUCALYPTUS OIL

Eucalyptus oil has bioactivity such as antifungal and antimycotoxigenic activities [10].

- **Antifungal activity**

Table-3: Overview about antifungal activity of eucalyptus oil [10]

Essential oil form	Fungal culture	Method	MIC/ inhibition[1]	References
Eucalyptus sp.	*Fusarium gramineruaum, Fusarium asiaticum, Fusarium verticillioides, Fusarium oxysporum, Aspergillus flavus, botrytis cinerea*	Poisoned food technique	33-75% inhibition at 1000µL/L	[6]
Eucalyptus camaldulensis	*Fusarium oxysporum, Fusarium proliferatum, Fusarium soloni, Fusarium subglutinans, Fusarium verticilloides*	Poisoned food technique	7-8µL/mL	[7]
Eucalyptus globulus	*Aspergillus parasiticus, Fusarium moniliforme*	Disc diffusion	9-27% inhibition at 500 µL/L	[8]
Eucalyptus globulus	*Aspergillus flavus, Aspergillus parasiticus*	Contact and volatile assay	100% inhibition at 500 µL/L	[9]

- **Antimycotoxigenic activity**

Table-4: overview studies about the antimycotoxigenic properties of essential oil [10].

Essential oil form	EO concentration	Mycotoxin	Method	Mycotoxin inhibition%	References
Eucalyptus radiata (leaf oil)	100-200 µL/mL	DON	HPLC, LOD:NI	37.47-37.70	[11]
Eucalyptus radiata (leaf oil)	100-200 µL/mL	ZEA	HPLC, LOD:0.01 µg/mL	38.48-97.32	[12]

- **Other uses**

Table-4: Other uses

Plants	Other uses
Eucalyptus globulus (eucalyptus)	-**Timber**: they are very tall and fast growing trees. They produce a hard wood good for timber, which can later be processed into paper, ships, railroad ties, mulch, charcoal, or bio fuel. -**Oral care**: They are added to make many mouthwashes and toothpastes. EO is also an ingredient in dentistry products used to sealing root canals and fillings. -**Agriculture:** It can also serve as forest cover for woodland crops. Dried leaves are used as feed for cattle, horses, and sheep. -**Cosmetics:** They are used in many beauty products. It can be found in some lotion, bubble bath solution, shower steamers, sals, soaps, salves, scrubs, deodorants, and more. -**Repellent:** they have insect repellents.

(Uses of *Eucalyptus globulus* plants)

- **Remedies and supplements**

Table-5: Remedies and supplements

Plants	Remedies and supplements
Eucalyptus globulus (eucalyptus)	-**Essential oil**: Eucalyptus essential oil can reduce sinus pain and swelling, as well as nasal congestion. It also can help

	reduce joint pain. -**Tincture**: like essential oil, eucalyptus tinctures can be inhaled or applied topically. Eucalyptus tinctures are typically used for decongestion due to its expectorant properties. -**Ointment**: as a cream, eucalyptus can be applied topically to relieve inflammation from joint pain and insect bites. -**Capsule**: when taken in this form, eucalyptus acts as a highly potent decongestive, helping to ease coughs and relieve sore throats.

(Remedies and supplements of *E. globulus* plants)

- **Side effects**

Table-6: Side effects

Plant	**Side effects**
Eucalyptus globulus (eucalyptus)	- Leaves are likely safe when consumed in controlled quantities. -It is possible to get eucalyptus poisoning with over uses of essential oils. -Eucalyptus poisoning include some signs like upset stomach, dizziness, muscle weakness, difficulty breathing, nausea, vomiting, and diarrhoea..

(Side effects of *E. globulus* plants)

IV. CONCLUSION

In line with multipurpose source, eucalyptus plant as well as essential oil is the champion oil ever in medicinal field, pharmaceutical fields, and pharmacognosy field. It is a fine oil in research practices, phytochemicals screening. Eucalyptus oil has strong antifungal activity, antimicrobial activity and antimycotoxigenic activity and antimycotoxigenic activity. 1-8, cineole is a main chemical component of eucalyptus plant and oil. It responsible for the medicinal properties. Consistent with the trade, eucalyptus oil the most important volatile oil for medicinal use and home remedies.

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