

## A Comparative Antimicrobial Study on the Essential Oil of the Leaves of Various Species of Cupressus

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### ABSTRACT:

The essential oil of leaves of various cupressus species Viz., *C.glauca*, *C.funnebris*, *C.lawsonia*, *C. macrocarpa* & *C. sempervirens* have been studied for their antimicrobial activity against certain gram positive [*B. substilis*, *S.aureus*], gram negative [*E.coli*, *P.aeruginosa*] and fungi (*A.niger*, *A.flavus*, *C.albicans* & *A. fumigatus*) using two fold serial dilution technique. Our results revealed that, all the species possess significant antibacterial & antifungal activities.

### INTRODUCTION

Cupressus (Family – cupressaceae) commonly known as ‘Cypress’ is a tall evergreen tree with slender branches & statuesque conical shape. It bears small flowers and round brownish grey cones growing wildly throughout the Nilgris and is also cultivated as an ornamental plant.<sup>1</sup> According to the literature review; the various parts of the plants have been used for various medicinal purposes like inflammation<sup>2</sup> and also for insecticide activity. In this direction, our efforts devoted in identifying the various species of cupressus found in Nilgris and antimicrobial screening of the essential oil of leaves and to establish a therapeutic rationale if any in their use.

### MATERIALS AND METHODS

#### COLLECTION AND IDENTIFICATION

The leaves of various cupressus species were collected from the Nilgris, identified and confirmed its authenticity by the

Medicinal Plants collection unit, Govt.arts college, Ooty.

#### METHOD OF SEPARATION OF ESSENTIAL OIL

The freshly collected cupressus leaves were washed with water to remove adhering material & dried in shade. The essential oil present in the fresh and dried leaves were distilled by hydro-distillation method using Clevenger’s apparatus<sup>3</sup>.

#### ANTIMICROBIAL STUDIES<sup>4,5,6</sup>

Antimicrobial studies of volatile oils of leaves of various species of cupressus against various strains of bacteria and fungi were carried out by two fold serial dilution technique. The concentration of the working stock culture were taken from 106 to 108 cfu/ml. The volatile oils were screened against the both gram positive (*B.substilis*, *S.aureus*), gram negative (*E.coli*, *P.aeruginosa*) and Fungi (*A.niger*, *A.flavus*, *C.albicans* & *A. fumigatus*). The

lowest concentration of the compounds which caused apparently a complete inhibition of growth of organisms was taken as the MIC (Minimum Inhibitory concentration).

## RESULTS AND DISCUSSION

In the antimicrobial screening *C.glauca*, *C.sempervirens*, *C.funnebris* and *C.lawsonia* are effective at a concentration of 200 mcg/ml (Table1) against both gram positive & gram negative bacteria whereas *C.macrocarpa* activity is more with gram

negative bacteria (100mcg/ml). The antifungal activity of *C.glauca* and *C.macrocarpa* lies in the range of 100mcg/ml. The activity shown by the (Table2) *C.macrocarpa* against *C.albicans* was highest (50mcg/ml) when compared to other species.

## CONCLUSION

We conclude that the essential oil of leaves of the cupressus species shows significant antibacterial & antifungal activities.

**TABLE -1**  
**ANTIBACTERIAL ACTIVITY OF ESSENTIAL OIL OF LEAVES OF VARIOUS SPECIES OF CUPRESSUS**

S.NO	Name of the Species	Minimum inhibitory Concentration ( µg/ml)			
		<i>E.coli</i>	<i>P.aureginosa</i>	<i>B.subtilis</i>	<i>S.aureus</i>
1.	<i>C.funnebris</i>	200	200	200	200
2.	<i>C.glauca</i>	200	200	200	200
3.	<i>C.lawsonia</i>	200	200	200	200
4.	<i>C.macrocarpa</i>	100	100	200	200
5.	<i>C.sempervirens</i>	200	200	200	200

**TABLE -2**  
**ANTIFUNGAL ACTIVITY OF ESSENTIAL OIL OF LEAVES OF VARIOUS SPECIES OF CUPRESSUS**

S.NO	Name of the Species	Minimum inhibitory Concentration ( µg/ml)			
		<i>A.niger</i>	<i>A.flavus</i>	<i>C.albicans</i>	<i>A.fumigatus</i>
1.	<i>C.funnebris</i>	200	200	200	200
2.	<i>C.glauca</i>	100	100	200	100
3.	<i>C.lawsonia</i>	100	100	200	200

4.	<i>C.macropcarpa</i>	100	100	50	100
5.	<i>C.sempervirens</i>	200	200	100	200

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