

ANTIMICROBIAL ACTIVITY OF ESSENTIAL OIL OF *LEONOTIS NEPETAEFOLIA*

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ABSTRACT: *The essential oil of Leonotis nepetaefolia (Family – Labiatae) was tested for its antibacterial activity against both Gram positive and Gram negative bacteria and found to be moderately active excepting Pseudomonas aeruginosa. The essential oil also was found to be inhibitory to dermatophytic fungi and suppressive to other aerial fungi. Hence the oil may be quite useful in skin infection due to dermatophytes even with secondary bacterial infections.*

INTRODUCTION

Leonotis nepetaefolia (Fam : Labiatae) is one of the important Ayurvedic herbal drug known as Grantiparanai in Sanskrit. Phytochemical examination of this plant yielded different diterpenoids of labdane type^{1,2,3}. A new coumarin from Indian variety has also been reported⁴. This plant exhibited various biological activities viz. antifungal, antimalarial⁵, anticancer⁶ and hypotensive.

MATERIALS AND METHODS

The plant material was collected in the month of Dec. 1991 and the leaves (1 kg) were crushed and subjected to steam distillation. The essential oil was extracted from the distillate by ether and is used for antibacterial and antifungal studies (yield – 100 mg from 100g of fresh leaves).

Authentic bacterial and fungal cultures were procured from King Institute, Guindy, Madras and maintained in the laboratory by periodic subcultures.

Antibacterial activity of the essential oil of the plant was tested by disk diffusion method⁸. Different dilutions viz. undiluted, 1:10, 1:100 and 1:1000 were tested against the bacteria and the diameter of the zone of inhibition were noted (Table I). All the bacteria tested were sensitive to standard antibiotics.

Antifungal activity of the essential oil was carried out by agar dilution method in Saboraud agar medium against dermatophytes and other filamentous fungi. The abundance of the growth on the media was graded as 1+, 2+, 3+ and 4+ accordingly (Table. II).

RESULTS AND DISCUSSION

Table I showed that the essential oil was inhibitory to all the bacteria excepting *Pseudomonas aeruginosa*. The activity decreased with increase of dilution against all bacteria and ineffective at 1/100 and 1/1000 dilution against *E.coli* and *Sh.boydii*. The activity of the essential oil may be summarized as: *S. typhi* > *Kleb.*

Pneumonise > *E. coli* > *Staph. Aureus* > *Sh. Boydii*. As the oil was inhibitory to both, gram positive and negative organisms, it may be considered to have a broad spectrum antibiotic activity.

The oil was found to be quite inhibitory to all the 4 dermatophytes tested as there was no growth in the tubes containing undiluted essential oil. The oil showed less inhibition

against other aerial fungi as there was less growth (2+) compared to the normal growth (4+). Hence this oil may be tried in ringworm (tinea) infection affecting the Keratinous structures of the body successfully. Secondary infection due to bacteria is usually common in tinea infection and in such cases this oil may be useful as it is found to have antibacterial activity also.

TABLE I
Antibacterial activity of essential oil of *L.mepetaefolia*

S. No.	Bacteria	Diameter of zone of inhibition (mm)				P	S
		Undiluted	1:10	1:100	1:1000		
1	<i>Staph. Aureus</i>	11	10	8	6	20	-
2	<i>E.coli</i>	13	11	7	NS	-	14
3	<i>Kleb. Pneumoniae</i>	14	12	11	7	-	16
4	<i>Sal. Typhi</i>	18	16	7	6	-	20
5	<i>Ps. Aeruginosa</i>	NS	NS	NS	NS	-	8
6	<i>Sh. Boydii</i>	10	6	NS	NS	-	12

NS - Not sensitive (No zone of inhibition)

P - Pencillin

S - Streptomycin

TABLE II
Antifungal activity of essential oil of *L.nepetaefolia*

S. No.	Fungus	Control	Undiluted	1:10	1:100
1	<i>T. mentagrophyte</i>	3+	-ve	1+	3+
2	<i>M. gypseum</i>	3+	-ve	1+	2+
3	<i>M. nanum</i>	3+	-ve	2+	2+
4	<i>E.floccosum</i>	3+	-ve	2+	2+
5	<i>A.niger</i>	4+	2+	4+	4+
6	<i>A.flavus</i>	4+	2+	4+	4+
7	<i>A.fumigatus</i>	4+	2+	4+	4+

+ Growth

-ve No growth

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