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Short Communication

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Antimicrobial activity of *Teucrium plectranthoides* Gamble essential oil.

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Abstract

Objective: Detection of antimicrobial activity of *Teucrium plectranthoides* essential oil. Materials and methods: Essential oil was separated from *Teucrium plectranthoides* by hydrodistillation. Antimicrobial activity of the essential oil was tested against seven bacteria and eight fungi using filter paper disk diffusion method. Results: The growth of almost all microorganisms was inhibited by the activity of the essential oil. Conclusion: The essential oil of *T. plectranthoides* can be used to develop commercial microbicides.

Keywords: *T. plectranthoides,* Essential oil, Antimicrobial activity

1. Introduction

In recent years, the essential oils have received much attention as resources of potentially useful bioactive compounds. Particular emphasis has been placed on their antimicrobial and antifungal action [1-3]. Today there is an increasing interest in the use of 'microbicidal' plants, because of the necessity of finding safer microbicides in combination with the need of preventing environmental degradation and pollution.

Owing to the presence of active secondary metabolites, mainly flavonoids [4] and neoclerodane diterpenoide [5], many species of *Teucrium* are currently used in folkmedicine of many countries [6-9]. Many species of *Teucrium* are reported to possess astringent, diaphoretic, anthelmintic [10], antibacterial [11] and antifungal properties [12]. In the present investigation the microbicidal activity of the essential oil of *T. plectranthoides* was studied against fifteen economically important microorganisms.

2. Materials and methods

T. plectranthoides, growing wild in Thekkady, Kerala, India was collected in October-December and authenticated at the Herbarium

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Table 1
Microbicidal activity of *T. plectranthoides* essential oil

Microorganisms	Zone of inhibition in mm*+			
	Dilutions of the essential oil in acetone			Standards
	1:0	1:1	1:2	
Bacteria				Gentamycin (40 mg/ml)
Bacillus megaterium	29	27	26	45
B. subtilis	27	25	22	48
Escherichia coli	35	33	32	29
Staphylococcus aureus	38	33	28	35
Pseudomonas aeruginosa.	20	18	17	40
Proteus vulgaris	32	29	27	28
Xanthomonas campestris	32	30	28	53
Fungi				Nystatin (50 IU)
Aspergillus niger	24	22	20	38
A. parasiticus	27	25	22	29
Rhizopus oryzae	16	16	16	31
Rhizoctonia oryzae-sativae	18	16	16	33
Colletotrichum musae	16	16	16	31
Fusarium solani	22	20	19	41
Candida albicans	27	25	23	30
Alternaria brassicicola	22	20	18	32

* Including the diameter of the filter paper disk 16 mm.
\+ Mean value of three independent experiments.

of Botany Department, University of Calicut. Shade dried aerial plant parts were hydrodistilled in a Clevenger apparatus at 100°C for 4 h.

The aromatic essential oil obtained was used for investigation.To test the antimicrobial property, seven bacteria and eight fungi (origin: MTCC Gene Bank, Institute of Microbial Technology, Chandigarh, India) were used. Antimicrobial activity was studied using filter paper disk diffusion method [13]. The degree of growth inhibition was evaluated after 48 hrs. and compared with the growth inhibition results obtained from the controls (Gentamycin for bacteria and Nystatin for fungi).

3. Results and discussion

The results presented in Table 1 show that the growth of majority of the microorganisms tested was inhibited around the oiled filter paper. On dilution with acetone, the activity of the oil was reduced slightly. Maximum activity was shown by the pure oil against *Staphylococcus aureus, Escherichia coli, Proteus vulgaris* and *Xanthomonas campestris.*

The inhibitory activity of the essential oil was much greater in the case of *S. aureus, E. coli* and *P. vulgaris,* when compared with that of the standards used. Remarkable inhibitory effects were observed against *Bacillus megaterium, B. subtilis, Aspergillus niger, A. parasiticus, Candida albicans, Fusarium solani* and *Alternaria 0brassicicola* also.

The results clearly confirm the antimicrobial potential of *T. plectranthoides.* The essential

oil of this plant showed some superiority over commercial bactericide gentamycin. Since herbal pesticides and fungicides are usually easily biodegradable, the essential oil and crude extract of *T. plectranthoides* may be developed

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