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Short Communication

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Microbicidal potential of essential oil of *Curcuma haritha* Mangaly & Sabu

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Abstract

Objective: Detection of antimicrobial activity of *Curcuma haritha* essential oil. Materials and methods: Essential oil was separated from *Curcuma haritha* by hydrodistillation. Antimicrobial activity of this oil was tested against six fungi and four bacteria by using filterpaper disk diffusion method. Results: The growth of almost all microorganisms were inhibited by the activity of the essential oil. Conclusion: The essential oil of *C. haritha* can be used to develop commercial herbal microbicides.

Keywords: *Curcuma haritha*, 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 [1-5]. 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.

The aromaticity of plants is mainly due to the presence of secondary metabolites like flavanoids, terpenoids etc. [6]. *Curcuma domestica*, a related species of *Curcuma haritha*, contains aromatic chemicals and it is used as folk medicines in many countries [7]. *C. haritha* essential oil contains camphor as the major component (21.24%) [8]. In the present investigation the microbicidal potential of essential oil of *C. haritha* is tested against ten commercially important microbes.

2. Materials and methods

C. haritha was collected from Balussery village of Kozhikode district of Kerala in August-

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Table 1
Microbicidal activities of *Curcuma haritha* Mangaly & Sabu essential oil

Microorganisms	**Zone of inhibition in mm *+**			
	Dilutions of the oil in acetone			**Standards**
	1:0	**1:1**	**1:2**	
Fungi				**Nystatin (50 IU)**
A. parasiticus	50	50	40	29
R. oryzae sativae	40	40	25	33
R. oryzae	25	30	25	31
C. albicans	21	20	20	30
A. niger	24	21	20	38
F. solani	30	28	25	41
Bacteria				**Gentamycin sulphate (40 mg/ml)**
B. megaterium	27	28	21	45
B. subtilis	25	25	23	48
P. vulgaris	31	25	25	28
E. coli	40	38	38	29

* including the diameter of the filter paper disk (20 mm)
+ mean value of three independent experiments.

September and authenticated at the herbarium of Botany Department, University of Calicut. Shade dried aerial parts were hydrodistilled in a Clevenger apparatus at 100°C for 4 h. The aromatic essential oil obtained was separated by diethyl ether and used for the investigation. To test the antimicrobial property six fungi and four bacteria (Origin: MTCC Gene Bank, Institute of Microbial Technology, Chandigarh, India) were used (Table 1).

Antimicrobial activity was studied using filter paper disk diffusion method [9]. The degree of growth inhibition was evaluated after 48 h 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 microbes tested was inhibited around the oiled filter paper. On dilution with Acetone the activity of oil was reduced slightly. Maximum activity was shown by the pure oil against *Aspergillus parasiticus, Rhizoctonia oryzae* sativae and *E. coli*. The inhibitory activity was maximum in the case of *A. parasiticus* and least in the case of *Candida albicans*. Notable inhibitory effects were observed against *R. oryzae, B. subtilis, B. megaterium* and *P. vulgaris.*

4. Conclusion

The results clearly confirm the antimicrobial potential of *Curcuma haritha*. The essential oil of this plant showed some superiority over commercial bactericide gentamycin. Since herbal pesticides and fungicides are nontoxic and biodegradable, the essential oil and crude extract of *C. haritha* can be recommended as potential microbicide.

References

1. Thoppil JE, Tajo A, Minija J. (1998) *Fitoterapia* 69: 191-192.

2. Tajo A, Minija J, Deena MJ, Thoppil JE. (1999) *Ind. Perfum.* 43(4): 179-181.

3. Deena MJ, Thoppil JE. (2000) *Fitoterapia* 71: 453-455.

4. Minija J, Thoppil JE . (2001) *J. Nat. Rem.* 1/2: 147-150.

5. Deena MJ, Sreeranjini K, Thoppil JE. (2000) *Int. J. Aromatherapy* 12: 105-107.

6. Harborne JB, Thomas Barberan FA, Williams CA, Gil MI. (1986) *Phytochem.* 25: 2811-2816.

7. Bhattarcharjee SK. (2000) *Handbook of Medicinal Plants*, Pointer Publishers: Jaipur; 118-119.

8. Mathew D, George V, Pushpangadhan P. (2002) *J. Spices and Arom. Crops*, 11(1):

9. Benson HJ. (1990) *Microbiological applications*, Wan C. Brown Publishers: USA; 134.