Anti-microbial potential of the rhizome extracts of *Curcuma amada* Roxb

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ABSTRACT

Steam distillation, Petroleum ether and ethanol extracts from *Curcuma amada* rhizomes were evaluated for their antimicrobial activity in-vitro. Ethanol extract exhibited broad-spectrum antibacterial and antifungal activity against the tested organisms. It showed highest antifungal and antibacterial activity against *Aspergillus niger* and *Bacillus subtilis*, respectively. Activity indices of *A. niger* against miconazole (25 µg/ml) and *B. subtilis* against chloromphenicol (10 µg/ml) were 0.60 and 0.73, respectively.

Key words: Antibacterial, Antifungal, *Curcuma amada*, Rhizome extracts

INTRODUCTION

The plants belonging to Zingiberaceae family are found to be a rich source of substances of phytochemical interest\(^1\). Numbers of plants from this family are used in traditional system of medicine\(^2\). *Curcuma amada* is one member of this family, which is traditionally used as carminative and stomachic\(^2\). Literature survey indicates the presence of multiple chemical constituents in this rhizomes\(^3-5\). However, very few references about the evaluation of pharmacological activity of the extract are available\(^5,6\) indicating its carminative\(^2\), stomachic\(^2\) and CNS activity\(^6\). The extract exhibited hypercholesteremic effect in rabbits\(^7\) and showed presence of antibiotic principle with strong inhibitory activity on *Aspergillus niger* and *Trichophyta rubrum* \(^8\). The rhizomes are used for the treatment of inflammatory conditions as a household remedy on empirical basis. It was, therefore, decided to screen their extract for anti-inflammatory activity using animal models.

MATERIAL AND METHOD

Dried rhizomes of *Curcuma amada* Roxb. (Zingiberaceae) were obtained from market at Pune and identified in the department of botany, Rajasthan Agriculture University (India). Bacterial strains were obtained from pure stock culture of microbiology department, Rajasthan Agriculture University, Bikaner (India). All other solvents and chemicals are analytical reagent and purchased from Merck limited, Mumbai (India).

Steam distilled (yield: 4.17%), Petroleum ether extract (Yield: 4.66), Ethanol extract (Yield: 6.79%) were prepared separately from dried rhizomes following souza et al\(^9\). The ethanol and petroleum ether extracts were concentrated in vacuum and solution of each as well as of the steam distillation fraction (v/v) were dissolved in 10% DMSO (dimethyl sulfox-
Chlormphenicol (10 µg/ml) and miconazole (µg/ml) were used as positive control. Cup-plate assay method was used to screen the extract for antimicrobial activity against bacillus subtilis, Staphylococcus aureus, Escherichia coli, Pseudomonas aeruginosa, and Micrococcus luteus. Nutrient agar plate were swabbed with the respective broth culture of the organisms and kept for 15 min. in laminar chamber for absorption to take place. Well were made in agar plate using a sterile cork borer (5 mm diameter) and 10 µl of extract was added to each well. The plates were incubated at 37ºC for 24 hrs and diameters of the inhibition zone were measured in millimeter. The antifungal activity of extract against Fusarium oxysporum, Aspergillus niger, Helminthosporium oryzae was evaluated in molten potato dextrose agar medium and inoculated similar to antibacterial assay. The plates were incubated at 27ºC for 3 days.

**RESULTS**

The Ethanol extract and petroleum ether extract displayed antifungal activity and broad spectrum of antibacterial activity against all the tested strains (Tables 1 and 2). The steam distillation extract showed less activity than that of Ethanolic and petroleum ether extract at the tested concentration against both bacterial and fungal strains. Activity indices of tested bacteria were different in value against chlormphenicol (10µg/ml). The microorganisms studied here showed obvious differences in their susceptibility to Curcuma amada rhizome extracts. Ethanolic extract showed highest antifungal and antibacterial activity against *Aspergillus niger* and *Bacillus subtilis*.

<table>
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<tr>
<th>Extract</th>
<th>Conc.(mg/ml)</th>
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<td>M</td>
<td>25 µg/ml</td>
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Abbreviations are; M = miconazole (25 mg/ml), F. o. = Fusarium oxysporum, A. n. = Aspergillus niger, H. o. = Helminthosporium oryzae and other abbreviations / condition are same as in table –1.

**CONCLUSION**

In conclusion, our observation confirm that the Ethanolic extracts are better than that of petroleum ether or steam distillation extract of Curcuma amada rhizome in respect to their antimicrobial activity and the broad spectrum of activity makes it a promising indigenous drug.

**REFERENCES**


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