

Study of Anti-Microbial Activity of Fruit Rind Extracts of *Garcinia Indica*

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ABSTRACT:- *Garcinia indica* choisy, from family clusiaceae is a fruit tree of culinary, pharmaceutical, nutraceutical uses. It is widely grown in Asian and African countries. In India it is found in western ghats, south and north states. It is large genus of polygamous trees or shrubs and rich source of xanthenes, flavanoids, bezophenone, lactones and phenolic acids. The antimicrobial activity of different solvent extracts of dried rind of kokum was investigated by testing against microbial organisms. The minimum inhibitory concentration (MIC) of the extract was determined against four bacteria strains using the broth dilution method. The ethyl acetate extract showed the best antibacterial activity.

I INTRODUCTION

Medicines derived from plants are considered to be good in maintaining health and combating diseases and even today also plant source is a main source of new drug of therapeutic property. In India polyherbal formulation shows antitumor, anti-inflammatory, antimicrobial, antifungal and antiulcer activity (Ramchandran HD, 2014, Samy RP et al., 2008.). *Garcinia* contains 200 species out of which 20 are found in India and *Garcinia* species are rich in oxygenated and prenylated phenol derivatives containing xanthenes, flavanoids, benzophenone, lactones and phenolic acids. (Ibrahim Jantan et al., 2011, Fayaz Pasha P et al., 2014, K.N. Varlakshmi et al., 2010). *Garcinia indica* one of the medicinally important deciduous plant found to be rich in polysaccharide (Fayaz Pasha P. et al., 2014). Kokum contains two major active compounds having nutraceuticals properties namely HCA and garcinol present in fruit rind of kokum (Varsha Anil Parasharami et al., 2015). HCA helps to lower fat level with no loss of protein and thus it acts as anti-obesity agent (S.A. Lamture et al., 2014). Kokum contain B-complex vitamins and minerals like potassium, manganese and magnesium which helps to control blood pressure, heart, also protect against stroke and coronary diseases (Shrikant Basligappa Swami et al., 2014, D.N. Mayura et al., 2014, Seema V Nayak et al., 2019). Garcinol is a poly isoprenylated benzophenone derivative which has antioxidant, anti-inflammatory, anticancer and antimicrobial activity (Fayaz Pasha P. et al., 2014).

II. MATERIAL AND METHOD

The antibacterial activity of the Ethyl acetate, aqua ethanolic (50:50), ethanol, methanol, n-Hexane, and xylene soxhlet extracts of dried rind of kokum was investigated by testing the extracts against *B. subtilis*, *P. aeruginosa* and *S.aureus*. The minimum inhibitory concentration (MIC) of the extract was determined against the four bacteria strains using the broth dilution method.

The microbial organisms used for the study were Gram-positive bacteria: *Bacillus subtilis* *Staphylococcus aureus*; Gram-negative bacteria: *Escherichia coli*, *Pseudomonas aeruginosa*; and the yeast *Candida albicans*.

The broth dilution technique was used to determine the MIC against the test organisms (Vishnu priya V et al., 2010).

Sterile test tubes containing 5 ml double strength nutrient broth were added graded concentrations of the extract of *Garcinia indica* (0-16 % w/v). The contents of the tubes were diluted with calculated volumes of sterile water and inoculated with 0.2 ml of the test organisms previously diluted to contain approximately 10⁵ cfu / ml. A tube without an extract and another without a test organisms were used as controls. The tubes were incubated at 37^o C for 24 hrs. (bacteria) and at 30^o C for 72 hrs. (fungus) and observed for growth in the form of turbidity. The experiments were conducted in triplicate. The tube with the lowest concentration of the extract which showed no growth after incubation was taken and recorded as the MIC.

Invitro antimicrobial efficacy of topical products

The cup-plate method was used to assess the relative antimicrobial efficacy of the four topical products prepared with the methanol, ethanol, ethyl acetate and water: alcohol (50:50) extract of the fruit rind of *Garcinia indica*. A Molten nutrient agar

stabilized at 45^o C, seeded with 0.1 ml of a 24 hrs broth culture of the test organism (B. Sublitis, E. coli, P. aeruginosa and S. aureus) and containing approximately 10⁵ cfu/ml was used.. Cicatrin cream and miconazole cream were used as standards for the bacteria strains and C. albicans, respectively. The plates were pre-incubated for 1 hr. at room temperature to ensure adequate diffusion and finally incubated at 37^o C for 24hrs. Sabouraud dextrose sugar was used to test the antifungal activity of the topical products against C. albicans and the seeded plates were incubated at 30^o C for 3 days. The zones of inhibition were determined and recorded.

III. RESULT AND CONCLUSION

Required Test	Observation	Test Method
Determination of minimum inhibitory concentration(MIC) Ethyl acetate extract	4.0%	Broth Dilution Technique
Determination of minimum inhibitory concentration (MIC) Methanol extract	12.0%	Broth Dilution Technique
Determination of minimum inhibitory concentration (MIC) Ethanol extract	7.0%	Broth Dilution Technique
Determination of minimum inhibitory concentration(MIC) Xylene extract	No resistivity	Broth Dilution Technique
Determination of minimum inhibitory concentration (MIC) n- Hexane extract	No resistivity	Broth Dilution Technique
Determination of minimum inhibitory concentration (MIC) Water: Alcohol (50:50) extract	9.0%	Broth Dilution Technique

The Ethyl acetate and aqua alcoholic and ethanol extracts showed good activity while the methanol showed little activity while, xylene, and n-Hexane extract showed no resistivity. The Ethyl acetate extract showed the best antibacterial activity.

IV. REFERENCES

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