



ANTI BACTERIAL EFFECT OF ETHANOLIC LEAF EXTRACT OF *CARALLUMA FIMBRIATA* ON *E.FAECALIS* -AN INVITRO STUDY

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ABSTRACT

Aim: To evaluate the antibacterial activity of the Ethanolic leaf Extract of *Caralluma fimbriata* against *E. faecalis*

Method: Agar well diffusion assay as well as micro broth dilution assays were used for determination of antibacterial activity.

Results: Different concentrations of the extract (200mg/mL, 400mg/mL and 800mg/mL) showed dose dependant antibacterial activity and the MBC was found to be more than 400 mg/ mL

Conclusion: This study suggests that the Ethanolic extract of *Caralluma fimbriata* leaf contains promising antibacterial substances which is having activity against *E.faecalis*.

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INTRODUCTION

Caralluma fimbriata is a succulent plant in the family *Apocynaceae*. *Caralluma fimbriata* has been eaten in rural India for centuries, as a raw vegetable with spices, or preserved in chutneys and pickles and is often found as a roadside shrub or boundary marker.[1] *Caralluma fimbriata* contains pregnane glycosides, a phytochemical that blocks the enzyme citrate lyase. When this enzyme's activity is stopped, the body cannot produce fat. So, *Caralluma Fimbriata* blocks the enzymes responsible for breaking down and producing fatty acids in the body [2]. The main photochemicals in *Caralluma fimbriata* are pregnane glycosides [3,4] flavone glycosides, megastigmane glycosides [5], bitter principles, saponins, various flavonoids [6] The plant has high antioxidant [7] Anti-inflammatory [8,9] Anti-nociceptive [10,11], anti-diabetic [12,13], anti-ulcer [14], gastric mucosa protecting, and cytoprotective properties [14]. So *Caralluma* has medicinal uses in the treatment of Rheumatism, Diabetes, Leprosy, Antiseptics & Disinfectants [15]. *Caralluma fimbriata* has antibacterial activity against *E.coli*, *Bacillus Sp.*, *Proteus Sp.*, *S. aureus*, *S. epidermidis*, *Klebsiella Sp.* So in this study, the antibacterial activity of *Caralluma fimbriata* is found against *E.faecalis* Enterococcus *faecalis*-is a Gram-positive, commensal bacterium inhabiting the gastrointestinal tracts of humans and other mammals.[16]

cause life-threatening infections in human, especially in the nosocomial (hospital) environment, where the naturally high levels of antibiotic resistance found in *E. faecalis* contribute to its pathogenicity.[16] *E. faecalis* has been frequently found in root canal-treated teeth in prevalence values ranging from 30% to 90% of the cases.[17] Root canal-treated teeth are about nine times more likely to harbor *E.faecalis* than cases of primary infections.[18]

MATERIALS AND METHODS

Materials and Methods: Ethanolic extract of *Caralluma fimbriata*

Microbial strain used: *E. faecalis* ATCC

Culture media: Mueller Hinton Agar

Standardization of Bacterial Suspension

The bacterial suspension was standardized following the CLSI guidelines and was grown in Mueller Hinton Broth (MHB, Hi-Media) for 18-24 h, followed by the matching of bacterial suspension to the turbidity equivalent to 0.5 McFarland solution (1-2 × 10⁸ CFU/mL) with the addition of sterile saline.

Agar well diffusion assay

Evaluation of the antimicrobial activity of the Ethanolic extract of *Caralluma fimbriata* leaf extract was conducted by agar well diffusion assay method.[19,20] The different concentrations (200 mg/mL, 400, mg/mL and 800 mg/mL) of the plant extract was prepared and from this 100 µL was used

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for the study. 0.2% chlorhexidine was used as the control. The study was carried out in triplicate.

Minimum Inhibitory Concentration (MIC) and Minimum Bactericidal Concentration (MBC):

The MIC of the ethanolic extract of *Caralluma fimbriata* was determined by microbroth dilution method using 96-well microtitre plates. The MIC value of the extract was determined as the lowest concentration of the extract that completely inhibited bacterial growth after 48 hrs of incubation at 37°C.^[21] For the determination of MBC, a portion of liquid (5 µl) from each well that exhibited no growth were taken and then sub-cultured and incubated 37°C for 24 hrs. The lowest concentration that revealed no visible bacterial growth after sub-culturing was taken as MBC.^[22]

RESULT AND DISCUSSION

Plants have been used for thousands of years to flavor and conserve food, to treat health disorders and to prevent diseases including epidemics. The knowledge of their healing properties has been transmitted over the centuries within and among human communities^[23].

In this study, different concentrations of the Ethanolic extract of *Caralluma fimbriata* showed maximum zone inhibition in a dose dependant manner (table :1). Maximum zone of inhibition was found to be 25 mm at 800mg/mL (Fig 1). The MIC/ MBC were found to be more than 400 mg/mL. Lin and Tang ^[24] reported that phenolic and flavonoids contents in various fruits and vegetables help immune-modulator organs, killing the microorganisms.

Table 1 Showing the zone of inhibition of the extract

Extract	Concentration (mg/mL)	Zone of inhibition (mm)
Ethanolic extract	200	7
	400	14
	800	25
Chlorhexidine	0.2 %	35

Anti bacterial effect of the Ethanolic extract

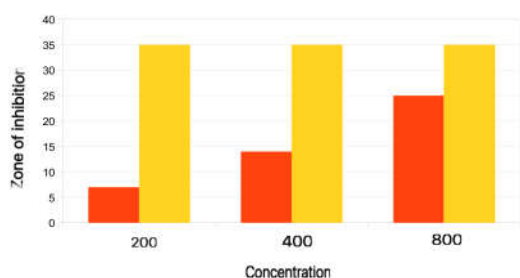


Figure 1 Graph showing anti bacterial activity of the leaf extract of *Caralluma fimbriata* leaf against *E.faecalis*

CONCLUSION

This study suggests that the Ethanolic extract of *Caralluma fimbriata* leaf contains promising antibacterial substances which is having activity against *E.faecalis* and may be considered for clinical purpose for management of *E.faecalis* infections.

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