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ANTIMICROBIAL ACTIVITY OF RHIZOME EXTRACTS OF *ALPINIA CALCARATA* ROSC

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ABSTRACT

The rhizome extracts of *Alpinia calcarata* Rosc were tested for their *in vitro* antibacterial and antifungal activity by disc diffusion method and agar plate method respectively. Zone of inhibition of the test extracts were compared with ciprofloxacin (5µg). The ethanolic extract showed highest inhibitory activity at the concentration of 100µg/ml against bacterial organisms and 120 µg/ml against fungal organisms. The ethanolic extract was found to be potent antibacterial and antifungal activity compared to other extracts, but less than that of the standard drug ciprofloxacin.

INTRODUCTION

Alpinia calcarata Rosc (zingiberaceae) is a perennial herb with horizontal root stock and tall leafy stems. It is widely distributed in warmer part of Asia and India[1]. In Malayalam it is known as kattuchena, chittaratha, in Sanskrit it is known as rasna, in Tamil it is known as amkolinji[2]. The rhizomes are reported to have anti-inflammatory, antiulcer and antispasmolytic activity[3]. The two diterpenoids caratanin D and calcaratanin E and Essential oil have been reported from the rhizome. In the present study, the antimicrobial activity of various extract of rhizomes was carried out.

MATERIALS AND METHODS

Plant material

The rhizomes of *Alpinia calcarata* Rosc were collected from Chennai, Tamilnadu. Sabouraud dextrose agar media was purchased from Himedia and strains from NCIM, Pune. Analytical grade reagents were used.

Preparation of extracts

The shade dried and coarsely powdered rhizome was extracted with hexane, chloroform, ethyl acetate, and ethanol successively by continous percolation method in soxhlet apparatus. The extracts were then concentrated, dried and stored in refrigerator.

Antimicrobial screening

Antibacterial activity against the gram positive organism Staphylococcus aureus, and gram negative organism Escherichia coli, Salmonella typhi, Pseudomonas aeruginosa were studied by disc diffusion method[4]. The discs of 6mm diameter were prepared from whatmann filter paper no.1 and sterilized in a hot air oven at 160°C for 1 hr. The discs were then impregnated with the extracts, Ciprofloxacin 5µg/disc and the solvent Dimethyl formamide (DMF). The sabouraud dextrose agar media were inoculated with bacterial culture by the standard procedure. The plate were allowed to dry. The standard, different extracts and DMF discs were placed on the agar plates and then the plates were kept at 4°C for 30 minutes to allow perfuram of drugs being tested. The plates were then incubated at 37°C for 24 hrs. The results were recorded (Table 1).

Table 1

Antibacterial Activity

Zone of Inhibition of Various Extracts

Extract	**Conc in µg/ml**	***E.coli***	***Pseudo***	***S.typhi***	***S.aureus***
Hexane	66.66	6	5	4	4
	100	12	8	9	7
Chloroform	66.66	6	4	8	5
	100	10	7	15	12
Ethylacetate	66.66	6	5	4	6
	100	12	10	12	12
Ethanol	66.66	6	8	8	7
	100	16	15	16	14
Ciprofloxacin	2.5	20	18	19	21
	5	35	32	36	38

E.coli-Escherichia coli,Pseudo-Pseudomonas aeruginosa,S.typhi-Salmonella typhi, S.aureus - Staphylococcus aureus

Table 2

Antifungal Activity

Extract	**Conc. In µg/ml**	**Rhiz**	**Rubra**	**Asp**
Hexane	40	+	+	+
	80	+	+	+
	120	-	-	-
Chloroform	40	+	+	+
	80	+	+	+
	120	-	-	-
Ethylacetate	40	+	+	+
	80	+	+	+
	120	-	-	-
Ethanol	40	+	+	+
	80	+	+	+
	120	-	-	-

Rhiz – Rhizopus, Rubra- Dermatophyton rubram, Asp- Aspergillus fumigator

Antifungal activity[5] against the fungal organisms such as *Aspergillus fumigator*, *Dermatophyton rubram, Rhizopus* was studied by agar slant method using sabouraud's dextrose agar media. The fungal organisms were inoculated to the slant and incubated at 37°C for 24 hrs. The results were recorded (Table 2).

RESULTS AND DISCUSSION

The results of the antibacterial activities and antifungal activities of the various extracts of the rhizomes were tabulated. The ethanolic extract was found to have more antibacterial and antifungal activity compared to the other extract, but less than that of the standard drug ciprofloxacin.

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