



Screening for the antimicrobial activities of the medicinal plants *Coccinia indica* and *Cassia auriculata*

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ABSTRACT

The crude ethanolic extracts of the leaves of *Cassia auriculata* and *Coccinia indica* were tested for their antimicrobial activities with three bacterial [*Staphylococcus aureus*, *Streptococcus pyrogens*, *Escherichia coli*] and two fungal [*Candida albicans*, *Trichophyton rubrum*] organisms. It was observed that both plants possess antibacterial activity against *Staphylococcus aureus* and *Streptococcus pyrogens*. *Cassia auriculata* showed some weak activity against Gram negative bacteria *E.coli*, while *Coccinia indica* was inactive. The antifungal activity studies on *C.albicans* and *T.rubrum* had negative results for both the plants. The above results clearly demonstrate selective anti bacterial activity of both medicinal plants.

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KEYWORDS

Cassia auriculata;
Coccinia indica;
Staphylococcus aureus;
Streptococcus pyrogens;
Escherichia coli;
Candida albicans;
Trichophyton rubrum;
Antimicrobial activity.

INTRODUCTION

Herbs and herbal products are widely exploited in the traditional system of medicine for their immense pharmacological activities. Most of the herbal products are used for their specificity and some of them in general in almost all the preparations with or without knowing their mechanism of action. Through recent advancement in science, research has provided a gate way for the recognition of these products as some of the properties are still to be elucidated and their application remains unknown for many dreadful diseases. Researchers have only begun to scratch the surface in terms of number of possible efficacious agents in the plant kingdom and have also begun to rediscover molecules which have been used medicinally for centuries and to define their properties scientifically. The current study aims in screening two such medicinal plants for their anti microbial activities.

C.auriculata Linn is a fast growing, ever green

shrub with reddish brown branches. The dried flower and leaf of the plant is used for many medicinal treatments^[1]. The flower and seed extracts has been proved for anti diabetic activity^[2]. There are a few experimental studies to show the antiviral activity of the plant^[3]. The flower and leaf extracts were proved to have antipyretic activity^[4]. The leaf extract was also found to have emollient effect^[5]. The plant is also used in skin diseases, leprosy and tumors^[6].

Coccinia indica is used widely by indigenous people of India for various treatments of Ayurvedic and Unani practices^[7]. The ethanolic leaf extract was shown to have hypoglycemic activity^[8]. The insulin stimulatory effect and antioxidant properties of the leaf extract was also proved recently^[9,10].

Previously isolated constituents

C.auriculata- Polysaccharides^[11], Flavonoids^[12], Anthracene derivatives and Dimeric procyanidines^[13], Alkane nonacosane-6-one^[14], Saponins^[15] and

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tannins^[16].

C.indica- Alkaloids^[17], Hypoglycemic principles, β -sitosterol, β -amyryn and Bitter glycoside containing cucurbitacin B & C, while seed contains fatty acids^[18].

MATERIALS AND METHODS

Plants

Leaves of *Cassia auriculata* (Ceasalpiniaceae) was collected from adjacent areas of Padappai, Tamil Nadu. Leaves of *Coccinia indica* (Cucurbitaceae) was collected from Tambaram, Chennai, Tamil Nadu. Both species were verified from the Department of Botany, Presidency College, Chennai.

Extraction

1gm of the powdered leaves was soaked in 100 ml of absolute ethanol. The mixture was kept in the rotary shaker for 48 hours. The contents were filtered through muslin cloth and the filter was dried at 55°C. The sediments were re-extracted as mentioned above. The dried extract was scrapped and stored at 4°C in air tight vials.

100mg of the ethanolic extract was dissolved in 10 ml of distilled water containing 0.5% dimethyl sulphoxide (DMSO). Working concentrations of extracts were prepared freshly and filtered through 0.45 microns filter before each assay and tested for any fungal or bacterial contaminations.

Studied activity

Screening of both antibacterial and antifungal activities was done by Kirby-Bauer agar disc diffusion method^[19].

Micro organisms used

Staphylococcus aureus, *Streptococcus pyrogens*, *Escherichia coli*, *Candida albicans* and *Trichophyton rubrum*. All the organisms were obtained from the Department of Microbiology and Biotechnology, Presidency college, Chennai-600 005.

RESULTS

TABLE 1 explains the antimicrobial activities of the plants. Extracts of both the plants showed activity against

TABLE 1 : Inhibition zones of *C.auriculata* and *C.indica* for bacterial and fungal organisms

Plant	Concentration (mg/ml)	Zone of inhibition(mm)				
		S.a	S.p	E.c	C.a	T.r
<i>Cassia auriculata</i>	25	8	8	-	-	-
	50	8	9	-	-	-
	100	10	10	4	-	-
<i>Coccinia indica</i>	25	-	-	-	-	-
	50	-	-	-	-	-
	100	8	8	-	-	-

S.aureus and *S.pyrogens*. *C.auriculata* was found to have some weak activity against the gram negative bacteria *E.coli* while *C.indica* almost lacked any activity. Both the extracts failed to demonstrate any antifungal activity against *C.albicans* and *T.rubrum*.

DISCUSSION

The leaf extracts of *C.auriculata* and *C.indica* possess antibacterial activity against *S.pyrogens* and *S.aureus* suggesting the potential of these plants to treat the bacterial infections of the skin. The study also may justify the traditional value of *C.auriculata* used in different skin diseases. Therefore these plants gain importance in screening them against various other species for their antimicrobial and antiviral properties. Flavonoids^[20], Alkaloids^[21], Procyanidins^[22] and Saponins^[23] were previously reported to have antimicrobial activities. These Compounds present in the plants could have been the reason behind the activity established in the current study. The biological significance may also be utilized in screening the plants for anti-inflammatory and anti tumour properties. The negative results of this pilot screening study may be useful for the scientific community to eliminate them in future screening process.

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