

Original Research Article

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Antibacterial Activity of Petals

B.S. Anuradha*

Department of Microbiology, Chaitanya Postgraduate College Hanamkonda, Telangana, India

*Corresponding author

ABSTRACT

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The present work study involves extraction of active ingredients from petals of Shoe flower (*Hibiscus rosa sinensis*), Chrysanthemum (*Chrysanthemum indicum.*), Ixora (*Ixora coccinea*), Jasmine (*Jasminums ambac*), Rose (*Rosaindica*), Catharanthus (*Catharanthusroseus* Pomegranate (*Punica granatum*) and to studied the antimicrobial activity on common human pathogens like *Staphylococci aureus* and *Ecoli* by agar well diffusion method. It is inferred that the crude extract of the petals of *C.roseus*, Jasmine, Ixora have satisfactory activity against *Staphylococci aureus* and *E. coli*, expected Chrysanthemum has satisfactory antimicrobial activity against *Staphylococci aureus* but not against *E. coli*. The present findings suggest that the petals of *C.roseus* can be used as antibacterial agent in new drugs for therapy against *E.coli* and *Staphylococci aureus*.

Introduction

Ever since the origin of mankind, a silent battle is in progress with the microorganism, each developing newer strategies to fight against each other. The prominent strategy in developing newer antimicrobial compounds started its leaps and bounds from the 20th century. These are also called as magic bullets as they selectively find the pathogen and destroy the pathogen but do not harm the host. Nature has been a source of medicinal agents for thousands of years and an impressive number of modern drugs have been isolated from natural sources, many based on their use in traditional medicine Higher plants, as sources of medicinal compounds, have continued to play a dominant role in the maintenance of

human health since ancient times (Farombi, 2003). Natural products play an important role in drug development programs in the pharmaceutical industry (Baker *et al.*, 1995). There are number of practical difficulties and bottle neck problems associated with the isolation and purification of antimicrobial compounds from these sources. To overcome this problem new novel antimicrobial compounds have to be discovered. Various plants have been screened all around the world every year to find the antimicrobial activity. Several studies reveal the presence of compounds with antimicrobial properties in various plant parts (Ieven *et al.*, 1979; Shanmuga Priya *et al.*, 2002). While the information on

antimicrobial activity of plant flowers and especially petals were scanty, the petals provide physical protection to the reproductive organs can be expected to synthesize potent bioactive compounds (Sridevi *et al.*, 2011). Interestingly symptoms of most plant diseases of bacterial or fungal origin have been reported mostly on leaves, stem, root and seldom on petals (Perez *et al.*, 1990). The effects of plant extracts on bacteria have been studied by a very large number of researchers in different parts of the world. Much work has been done on ethno medicinal plants in India (Lovelli *et al.*, 1993; Tumane *et al.*, 2000; Karuppuswamy *et al.*, 2002; Reddy *et al.*, 2001; Vijayalaxmi *et al.*, 2011). It has been suggested that aqueous and ethanolic extracts from plants used in allopathic medicine are potential sources of antiviral, antitumoral and antimicrobial agents. The selection of crude plant extracts for screening programs has the potential of being more successful in initial steps than the screening of pure compounds isolated from natural products (Reddy *et al.*, 2011; Vijayalaxmi *et al.*, 2011; Parmar *et al.*, 1978). Plant based antimicrobials represent a vast untapped source for medicine and has enormous therapeutic potentials.

Hence the antimicrobial activity of Shoe flower (*Hibiscus rosa sinensis*), Chrysanthemum (*Chrysanthemum indicum*), Ixora (*Ixora coccinea*), Jasmine (*Jasminum sambac*), Rose (*Rosa indica*), Catharanthus (*Catharanthus roseus*), Pomegranate (*Punica granatum*) plant flower petals has been investigated in the present study.

Materials and Methods

Collection of floral parts and preparation of extracts

The flower petals of Hibiscus, Chrysanthemum, Ixora, Jasmine,

Catharanthus, and Pomegranate were collected from various places in Hanamkonda Warangal A.P India.

The petals were surface sterilized with 0.1% Mercuric Chloride for 10 seconds. And washed with sterile distilled water for three successive times. The petals were dried in a drier and then crushed in mortar and pestle and aqueous extracts were prepared with sterile distilled water and filtered through Millipore filter.

Bacterial strains

Antibacterial activity of crude extracts of plant floral extracts were tested against *Staphylococci aureus* and *E coli*. The bacterial cultures were obtained from IMTECH (Chandigarh, India) within 24 h cultures were taken and inoculated in Nutrient agar medium. (Peptone (5g), Beef extract (3g), NaCl (5g), distilled water 1000ml)

Antibacterial activity

Antibacterial activity of plant floral extracts was determined by Agar-Agar well diffusion method (8). Nutrient agar plates were prepared by pour plate method. To the molten sterile NAM (40°-45°C), 0.1 mL of growth culture of the concerned test organism was mixed thoroughly and poured into sterile petriplate and allowed to solidify.

Wells of 3mm size were made with sterile cork borer and 50µl of the floral petal filtrate was poured into these wells. The plates were incubated for 24 h at 37°C. After the stipulated time the plates were observed for formation of inhibition zones. The diameter of the inhibition zones were measured using an antibiotic zone scale. The medium containing antibiotic streptomycin at a concentration of 10µg/ml was used as control.

Results and Discussion

The antibacterial activity of crude extract of petals from various plants was tested against both Gram +ve (*Staphylococci aureus*) and Gram -ve (*E coli*) and the results are shown in the Table 1. All the petals of the plants showed antimicrobial activity. Among the seven types of plant petals, 6 showed

antimicrobial activity against both *Staphylococci* and *E. coli*, where as *Chrysanthemum* did not show any antimicrobial activity against *E coli*. The petal extracts of Pomegranate showed maximum antimicrobial activity against *Staphylococci aureus* (3mm) followed by the petal extracts of Hibiscus, Catharanthus and Ixora. (2mm).

Table.1 Anti microbial activity of various petals on *Staphylococcus aureus* and *E.coli*

S. No	Name of the plant	Zone of Inhibition (mm)	
		<i>Staphylococcus aureus</i>	<i>E. coli</i>
1	<i>Hibiscus rosa sinesis</i>	2	1
2	<i>Chrysanthemum indicum</i>	1	0
3	<i>Rosa indica</i>	1	3
4	<i>Ixora coccinea</i>	2	1
5	<i>Catharanthes roseus</i>	2	0.5
6	<i>Punica granatum</i>	3	2
7	<i>Jasminum sambac</i>	0.5	1
8	<i>Streptomycin (Standard)</i>	6	6

In conclusion, the results revealed that crude extracts which are antimicrobial in nature. These antimicrobial compounds are synthesized by plants in response to microbial infections. The plant can also be further explored for its activity against wide spectrum of microorganisms and can be developed into a powerful antibiotic. The rapidity of this screening procedure by direct testing is a powerful tool to identify the petals of specific plant species as a source of new antibiotics. Flower petals which are mostly used for ornamental purpose or in preparation of aromatic oils can also be used as antimicrobial agents.

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