

**COMPARATIVE STUDY OF ANTIMICROBIAL ACTIVITY OF
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ABSTRACT

The present study was aimed at detecting and evaluating antimicrobial activities of *Eugenia caryophyllus* and *Cleome viscosa* known for their medicinal properties in folk medicine. The Acetone and Ethanol extract of *Eugenia caryophyllus* cloves shows good activity against some bacterial strains. In case of *Cleome viscosa* in all the extract ethanol extract showed the highest activity against all microorganism. In case of *Eugenia caryophyllus*, Acetone and Ethanol extract also shows good antifungal activity against *A.niger*, and *P.carysogenum*. In case of antifungal activity of *Cleome viscosa* ethanol extract showed highest antifungal activity.

KEYWORDS: *Eugenia caryophyllus*, *Cleome viscosa*, Antimicrobial activity, Studies.

INTRODUCTION

Eugenia caryophyllus. a plant belonging to family Myrtaceae.^[1] The clove tree is an evergreen which grows to a height ranging from 10-20m, having large oval clove and crimson flower in numerous groups of terminal clusters. the flower buds are at first of a pale color and gradually become green, after which they develop into a bright red, when they are ready for collecting. cloves are harvested when 1.5-2 cm long and consist of a long calyx, terminating in four spreading sepals and four unopened petals which form a small ball in the centre.

Cleome viscosa is a plant belonging to family Capparaceae. It is a weed distributed throughout the tropics of the world and the plains of India. The plant is an annual; sticky herb with a strong penetrating odour, seed. It is known as Hurhur (Hindi), hurhuria (Bengali), Nayikkadugu (Tamil) in Indian traditional medicine.^[2] Leaves are digitately compound, with 3-5 leaflets. Fruit 30-75 mm long, 3-5 mm broad, linear-oblong, erect, obliquely striated, tapering at both ends, glandular-pubescent, slender; style 2-5 mm long; seeds many, 1-1.4 mm in diam., glabrous with longitudinal striations and transverse ridges, dark brown. *Cleome viscosa* is highly effective in a wide spectrum of disease and reported to possess antidiarrhoeal, analgesic, pharmacological, antimicrobial properties including *in vitro* *Helicobacter pylori* and wound healing activity.^[3-4]

MATERIALS AND METHODS

1. Collection of clove of *Eugenia caryophyllus* and Seeds of *Cleome viscosa*.

Clove of *Eugenia caryophyllus* and Seeds of *Cleome viscosa* were collected from area around Kargi Chok, Dehradun during the month of Oct to Dec. The collected plant material was washed with water to remove mud and other undesirable material and dried under shade.

2. Extraction of clove of *Eugenia caryophyllus* and Seeds of *Cleome viscosa*.

The collected plant material was washed with water to remove other undesirable material and dried under shade. The air-dried clove (300 gm) of *Eugenia caryophyllus* were crushed. The crushed clove was extracted with different solvents of increasing polarity viz. acetone, ethanol at room temperature. The extract was evaporated till dryness to obtain residue. These extracts were concentrated under reduced pressure. The extract was used for antimicrobial activity.

The collected plant material was washed with water to remove other undesirable material and dried under shade. The air-dried seed (300 gm) of *Cleome viscosa* were crushed. The crushed seed was extracted with methanol at room temperature. The extract was evaporated till dryness to obtain residue. These extracts were concentrated under reduced pressure. The extract was used for antimicrobial activity.

4. Anti-microbial activity

The **anti-microbial activity** of the clove of *Eugenia caryophyllus* and Seeds of *Cleome viscosa* was carried out. The clove and seeds extract were screened for anti bacterial and anti fungal activities.

Anti bacterial activity of clove and seeds extract

In this study, the anti bacterial activity was studied against the micro organism and the bacterial cultures used in the study were.

1. *Pseudomonas aerugisa*
2. *Klebsiella species*
3. *B.cereus*

These bacterial cultures were maintained on nutrient agar slants at first being incubated at 37⁰ c for about 18-24 hours and then stored at 4⁰ c as stock for antibacterial activity. Fresh cultures were obtained by transferring a loop full of cultures into nutrient broth and then incubated at 37⁰c overnight. To test antibacterial activity, the well diffusion method used.

Culture media preparation

The microbiological media prepared as standard instruction provided by the HI-Media Laboratories, Mumbai. The media used for anti-bacterial activity Muller- Hinton Agar (MHA) and Nutrient broth (NB). They were prepared and sterilized at 121⁰C at 15 psi for 15-30 minutes autoclave.

Plate preparations

25 ml of pre autoclaved Muller-Hinton agar (MHA) was poured into 90 mm diameter pre sterilized petri-plates. These petri-plates were allowed to solidify at room temperature.

Well diffusion method

After the plated solidified the freshly prepared microbial growth culture suspension (about 20μl) was spread over the Muller – Hinton agar (MHA) media using L shaped sterilized glass spreader separately under the aseptic condition using laminar air flow. Then well were made in each plate with the help of borer of 8 mm diameter .In these well, about 100μl of each leaves extracts individually was loaded. This method depend upon the diffusion of leaves extracts from hole through the solidified agar layer of petri-dish to such an extent that the growth of added micro organism is prevented entirely in a circular area or Zone around the hole containing leaf extract.

Incubation: Petri plates were incubated for overnight at 37⁰C ± 0.5⁰C in the incubator.

Inhibition Measurement of zone of inhibition

After incubation, the diameter of clear zone of incubation produced around the well or holes were measured in mm by ESR Tube and compared with standard drug.

RESULTS

Table-1: Antibacterial activity of the extract of *Eugenia caryophyllus* (clove).

Test organism	Acetone	Ethanol)
<i>Pseudomonas aerugisa</i>	20 (36mm)	18 (36mm)
<i>Klebsiella species</i>	21 (35mm)	24 (35mm)
<i>B.cereus</i>	20 (-)	20 (-)

Table-2: Antibacterial activity of the extract of *Cleome viscosa* Seeds

Test organism	Acetone	Ethanol)
<i>Pseudomonas aerugisa</i>	9	15
<i>Klebsiella species</i>	12	14
<i>B.cereus</i>	10	17

Table- 3: Antifungal activity of the extract of *Eugenia caryophyllus* clove.

S. No.	Test organism	acetone	ethanol
1	<i>A.niger</i>	20	20
2	<i>Penicillium chrysogenum</i>	25	23

Table-4: Antibacterial activity of the extract of *Cleome viscosa* Seeds

S. No.	Test organism	acetone	ethanol
1	<i>A.niger</i>	8	13
2	<i>Penicillium chrysogenum</i>	10	12

DISCUSSION

In case of *Eugenia caryophyllus* Acetone and ethanol extract of clove showed similar activity against *B.cereus*. Ethanol extract of clove showed higher activity against *Klebsiella*. Acetone extract of clove showed higher activity against *Pseudomonas aerugisa*. In case of seeds of *Cleome viscosa* acetone and ethanol extract showed antibacterial activity against all tested microorganisms. Among all the extract ethanol extract showed the highest activity against all microorganism.

In case of **Eugenia caryophyllus** Acetone and ethanol extract of clove showed similar activity against *Aspergillus niger* and *P.chrysogenum*. In case of *Cleome viscosa* antifungal activity ethanol extract showed highest antifungal activity against *P.chrysogenum* and *Aspergillus niger*.

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