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## Effects of herbal ointment prepared from ethanolic extract of *Ficus racemosa* leaves on wound causing bacteria

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### Abstract

The *Ficus racemosa* plant is a member of the Moraceae family. It is used to treat a variety of illnesses, such as diabetes, liver problems, diarrhoea, inflammatory ailments, haemorrhoids, respiratory, and urinary illnesses. Pharmacological research on *F. racemosa* has examined its potential for antidiabetic, antipyretic, anti-inflammatory, antitussive, hepatoprotective, and antibacterial effects. In this paper, an effort was undertaken to examine the phytochemical components and antibacterial effects of the ethanolic extract on bacteria that cause wounds. The gel made from an ethanolic extract of *Ficus racemosa* works best against *S. aureus*, somewhat against *E. coli*, and least well against *Klebsiella spp.* That unmistakably demonstrated *Ficus racemosa* has antibacterial effect against wound microorganisms. Thus, we draw the conclusion that *Ficus racemosa* offers additional herbal treatments for wound care.

**Keywords:** *Ficus racemosa*, wound healing, herbal medicine, bacteria, ethanolic extract

### Introduction

*Ficus racemosa* Plant is a member of the Moraceae family. All sections of the *F. racemosa* plant, often known as "gular," are valued for their therapeutic properties in Ayurveda. Ayurveda, the traditional Indian medical system, has employed the popular medicinal plant *Ficus racemosa* Linn. (Moraceae) for many years to treat a variety of illnesses and problems, including diabetes, liver disorders, diarrhoea, inflammatory conditions, haemorrhoids, respiratory, and urinary infections. Pharmacological research on *F. racemosa* has examined its potential for antidiabetic, antipyretic, anti-inflammatory, antitussive, hepatoprotective, and antibacterial effects. *Ficus racemosa's* antimicrobial characteristics have been researched by Murti & Kumar (2011), Mandal *et al.* (2000), and Shaikh *et al.* (2010)<sup>[1, 2, 3]</sup>. According to Roy *et al.* in 2009 and Murti & Kumar in 2012<sup>[4, 5]</sup>, *F. racemosa* has a remarkable capacity for wound healing.

In this paper, an effort was undertaken to examine the phytochemical components and antibacterial effects of the ethanolic extract on bacteria that cause wounds.

### Materials & Methods

#### Plant materials

Leaves of *Ficus racemosa* were collected from the surroundings of Nuapada, Odisha. The plant species were identified with help of relevant local flora Saxena. & Brahmam (1989)<sup>[6]</sup>.

#### Preparation of extract

*Ficus racemosa* leaves were shade-dried and ground into a coarse powder. The powder was extracted using a hydro-alcoholic solvent (70% ethanol and 30% water) for 72 hours after being exposed to Soxhlet extraction. The surplus solvent was eliminated using a Rotary Flask Evaporator, and the resulting crude extract was kept in airtight containers and chilled to below 10 °C for future research. *Ficus racemosa's* crude leaf extract has a yield (w/w) of 14.5%.

### Preliminary phytochemical test

Phytochemical properties of the hydro-alcoholic residue of *Ficus racemosa* were tested using various reagent: Mayer and Dragendorff's reagent for alkaloids FeCl<sub>3</sub> for tannins; frothing test for saponins; Magnesium chip and HCl for flavonoids NaCl and Fehling's solution A and B for glycosides, diethyl ether, sulphuric acid, acetic anhydride for steroids; ether chloroform and NaOH for anthraquinone and FeCl<sub>3</sub> and K<sub>3</sub>Fe (CN)<sub>6</sub> for phenols and polyphenols.

### Preparation of ointment

The HEFG test samples were created in an ointment base. The basic ointment was made by melting weighed amounts of cetostearyl alcohol (5%), hard paraffin (3%), white soft paraffin (90%) and white bee's wax (2%). The simple ointment was combined with weighed amounts of HEFG leaf extract (5%) using an ointment slab and spatula. For microbiological research, the prepared ointments were kept in the fridge.

### Antibacterial activity of of ethanolic extract of *ficus racemosa* leaves on wound causing bacteria

#### Bacterial culture

A sterile cotton swab was used to remove the wound swab, which was then disseminated on blood agar and MacConkey agar media and incubated for 48 hours at 37 °C in a BOD incubator.

#### Identification

Identification was done by colony character, Grams staining & biochemical character.

### Qualitative test

#### Disc diffusion

On Nutrient agar plates, 10<sup>3</sup> CFU/ml of the appropriate bacterial cultures were used to create the bacterial lawn for this purpose. To obtain concordant readings, the herbal ointment-impregnated paper discs (Whatman filter paper No 1) were placed in triplicate. The zones of inhibition that the drug's activity (if any) indicated were quantified in millimetres.

#### Well diffusion method

The bacterial lawn was created for this purpose on Nutrient agar plates using 10<sup>3</sup> CFU/ml of the appropriate bacterial cultures. On the plate, three wells (8mm) were then created, and into these, the ointment was added. The zones of inhibition shown (if any) by the drug's activity were measured in millimetres.

### Results

*Staphylococcus aureus*, *E. Coli*, and *Klebsiella Sp.* were three bacteria that we were able to isolate from wounds during the course of the inquiry (Table 3). Alkaloids, tannin, Flavonoids, and other phytochemicals are present in the ethanolic extracts of *Ficus racemosa*. *S. aureus* responds best to the gel made from an ethanolic extract of *Ficus racemosa*.

**Table 1:** Isolation of extract from powdered material by soxhletion

Weight of Powdered materials (gm)*	Solvent Used Extraction	in	Extract obtained in (gm.)	% yield of crude extract
<i>Ficus racemosa</i> Leaves 150 gm	Ethanol	900 ml	5.27	3.50%

\*Powdered material defatted with in n-Hexane.

**Table 2:** Preliminary phytochemical screening of *ficus racemosa* extracts.

Constituents of plants	Ethanolic Extract
Alkaloids	+
Alkaloids	+
Saponins	-
Triterpenoids	-
Tannin	+
Flavonoids	+

**Table 3:** Identification of bacteria

Stain code	Grams stain	MR	VP	Indole	Citrate	Urease	Species
W001	+	+	+	-	+	+	<i>Staphylococcus aureus</i>
W002	-	+	-	+	-	-	<i>E. coli</i>
W003	-	-	+	-	+	+	<i>Klebsiella Sp.</i>

**Table 4:** Antibacterial activity

Sl. No.	Bacteria	Zone of inhibition of gel 5% (in mm)
1	<i>S. aureus</i>	19
2	<i>E. coli</i>	14
3	<i>Klebsiella Sp.</i>	12

### Conclusion

The gel made from an ethanolic extract of *Ficus racemosa* works best against *S. aureus*, somewhat against *E. coli*, and least well against *Klebsiella spp.* That unmistakably demonstrated *Ficus racemosa* has antibacterial effect against wound microorganisms. Thus, we draw the

conclusion that *Ficus racemosa* offers additional herbal treatments for wound care.

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