Studies on *Ficus racemosa* Fruit Extract: A Potent Antioxidant and Antibacterial Agent

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**Abstract:** The antioxidant therapy has increased significantly in the treatment of such diseases associated with free radicals. In order to address metabolic disorders, the therapeutic properties of plants have been investigated and explored for their potent antioxidant activity. This research highlights the phytochemical composition, antioxidant potential and antimicrobial activity of *Ficus racemosa* fruit extract (methanol), which is extensively used in the preparation of traditional medications to treat various metabolic diseases. Phytochemical analysis revealed alkaloids, flavonoids, glycosides, terpenoids, tannins and phenols that contributed for higher antioxidant and antibacterial activity. The methanolic extract showed a total phenolic and flavonoids content at 69 µg GAE/mg and 80 µg mg QE/g, respectively. Moreover, the antioxidant activity was evaluated by DPPH scavenging assay, ABTS assay and ion chelating activity. In all the methods, the methanolic extract of fruit showed significant antioxidant activity in a dose-dependent manner and IC50 value was 73.7 µg/ml for DPPH, 72.75 µg/ml for ion chelating and 59.3 µg/ml for ABTS assay. The antibacterial activity was evaluated against five pathogenic bacteria. Antibacterial study revealed that fruit extract exhibited good inhibition activity against pathogenic isolates. Study of well diffusion assay of *Ficus racemosa* fruit extract revealed that 100 µg/ml concentration has significant control over pathogens. Highest inhibition was obtained for *Streptococcus* spp. and *Staphylococcus* spp. with a zone of inhibition of 21 ± 0.34 and 18 ± 0.15 mm, respectively at 100 µg/ml. Based on all these results we conclude that the methanolic extract of *F. racemosa* acts as a potent antioxidant and an antibacterial agent. From this we can suggest the plant as a natural source of antioxidants and phytochemicals with potent antimicrobial properties, hence, it can be used for therapeutic purpose.

**Keywords:** *Ficus racemosa*, Phytochemicals, Antioxidant activity, Antibacterial activity, Pathogenic bacteria


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Introduction

The essential source of substances for human needs is nature. New drugs have been derived from natural plant components. According to studies, drugs made from natural sources are less harmful, have fewer side effects, and are more environmentally friendly than drugs made from chemicals. In today’s world, a novel strategy has been emerged to use herbal medicine which can treat infections without side effects.

Cellular damage brought on by the disruption of redox balance has been associated with a variety of chronic diseases, including diabetes, cancer, cardiovascular, and neurological diseases. Oxidative stress is caused by redox balance disruption brought on by an environment that is excessively pro-oxidative due to the formation of reactive oxygen and nitrogen species (Ghasemi Dehoo et al., 2020; Sharifi Rad et al., 2020). Oxidative stress and nitrosative stress are caused by oxidation reactions and nitrogen reactions, respectively. Both oxidative and nitrosative stress are the results of harmful chain reactions that damage cellular components and cause organ and tissue damage (Hamid et al., 2010; Sun et al., 2021; Apeh et al., 2022), which is the basis for the pathophysiology of many diseases. Exogenous antioxidants from dietary sources help people resist oxidative impairment by scavenging free radicals, reducing lipid per oxidation, protecting against oxidative damage to a range of other biomolecules, and regulating gut micro biota or epigenetic activity (Majeed et al., 2021). The use of dietary antioxidants is emerging as a result of the negative effects of synthetic antioxidants, which include cancer, allergies, hypersensitivity, asthma, hyperactivity, and neurological damage (Boadi et al., 2021) and its lower cost and better safety profile. The presence of bioactive phytochemicals is closely connected with the antioxidative properties of plant-based products.

The plant species Ficus racemosa (also known as Ficus glomerata) belongs to the Moraceae family. In the greater part of India, it is an evergreen, moderate- to large-sized deciduous tree that is extensively cultivated in villages for its edible fruit. It belongs to the class of plants known as "ksirivrkas," which are those that are good for human health, and is frequently grown in the vicinity of temples. It is commonly known as Cluster Fig tree, Indian Fig Tree or Goolar (Gular). Because of its vast range of therapeutic characteristics, F. glomerata is highly regarded in the ayurvedic and unani systems of medicine and is widely used in folk medicine to treat a wide range of diseases.

All parts of Ficus racemosa are medicinally important. Root, bark, leaves, fruit and galls are used for therapeutic activity. Additionally, the plant has a range of pharmacological effects, including anti-inflammatory, hepatoprotective, chemopreventive, antidiabetic, antipyretic, antiuretic, and hypolipidemic activity (Channabasavaraj et al., 2008; Manohar et al., 2013). The astringent fruit and bark are used to cure hemoptysis, menorrhagia, and haematuria. The phytochemical constituents of plants, such as flavonoids and polyphenols, aid in the prevention and treatment of numerous diseases. Numerous studies have supported that the flavonoids in plants had the potency of therapeutic properties (Kirankumar et al., 2013).

Owing to the relationship between antioxidants and diseases caused by the harmful effects of free radicals, this study aimed to identify and quantify the phytochemical constituents and the in vitro antioxidant activity of Ficus racemosa fruit (methanol) extract to exemplify its further potential development and use as drug against metabolic diseases. The present investigation was also undertaken to identify the potentiality of methanol extract of Ficus racemosa fruit on pathogens producing bacteria such as Escherichia coli, Pseudomonas fluorescens, Staphylococcus epidermidis, Staphylococcus saprophyticus and Streptococcus pneumonia particularly for finding new sources for antibacterial agents.
Materials and Methods

Sample Collection and Authentication:

Fresh fruit samples of *Ficus racemosa* were collected from Arakonnam, Ranipet district and were botanically identified and confirmed by a plant taxonomist Prof. P.Jayaraman, Plant Anatomy Research Center, Chennai.

Preparation of Methanolic Extract:

The collected *F. racemosa* fruits were shade dried for about 15 days and it was finely powdered. The pulverized powder was placed in a porous bag made of strong filter paper and were sequentially extracted with methanol (Me-OH) solvent in Soxhlet apparatus for 48 h. The extracts were evaporated to dryness under reduced pressure using a rotary evaporator and reduced pressure which yield 25.92% of *F. racemosa*.

Phytochemical screening of *Ficus racemosa* Fruit:

Qualitative analysis:

The preliminary qualitative phytochemical analyses of carbohydrates, saponins, alkaloids, flavonoids, fixed oils and fats, phenolic and tannins, glycosides, phytosterols and triterpenoids in the extracts were carried out using the standard methods (Debiyi *et al*., 1978; Trease *et al*., 1989; Makkar *et al*., 1993)

Quantitative analysis:

Total phenol content assay for *Ficus racemosa* Fruit Extract:

The total phenolics were determined in the *F. racemosa* fruit extract (Methanol) using Folin-Ciocalteu assay developed by Singleton *et al.* (1965), employing gallic acid as standard. About 20 μl of crude extracts were mixed 2 ml of distilled water. Then, 0.5 ml of Folin-Ciocalteu's phenol reagent was added to all the tubes. The tubes were then placed in the incubator for 3 min at 45°C. After 3 min, 2 ml of 20% Na₂CO₃ was added to all the tubes and kept for incubation after which its absorbance was measured at 650 nm using UV-Vis Spectrophotometer. The phenolic content was expressed as mg Gallic acid equivalents per g of dried extract. All measurements were performed in triplicate.

Total flavonoid content assay for *Ficus racemosa* Fruit Extract:

According to Karadeniz *et al.* (2005), the total flavonoid content of the crude extract was evaluated using the aluminium chloride colorimetric method. Quercetin was employed as the standard, and the flavonoid content was calculated as quercitin equivalent.

In brief 100 μl of the crude extract was mixed with 500 μl of distilled water and then 100 μl of 5% sodium nitrite was added. The solution was vortexed and allowed to stand at room temperature for 5 min. Then 150 μl of 10% aluminium chloride was added to the solution and allowed to stand for 6 min. After 6 min, 200 μl of 1 M sodium hydroxide solution was added to the test tube. The absorbance was read at 510 nm using UV-Vis Spectrophotometer. All measurements were performed in triplicate.

Evaluation of In Vitro Antioxidant Assays of *F. racemosa* fruit extract:

Antioxidant and free radical scavenging potential of *F. racemosa* fruit extract (methanol) was evaluated by using DPPH, ABTS, Ion chelating and TAC.

DPPH free radical scavenging activity:

The measurement of the DPPH radical scavenging activity was performed according to methodology described by Szabo *et al.* (2007). Briefly, a 0.5mM solution of 2, 2-diphenyl-1-picryl-hydrazyl (DPPH) in methanol was prepared and 1 ml of this solution was added to 1.5 ml of methanol extract at varying concentration of 10-100 μg/ml. When DPPH reacts with an antioxidant compound, which can donate hydrogen, it is reduced. The changes in color (from deep violet to light yellow) were read at 517 nm after 30 min of reaction using a UV-VIS spectrophotometer. Quercetin was used as positive control. Measurements were taken in triplicate. The scavenging activity percentage was determined according to the following equation:
% inhibition = Control O.D. – Sample O.D./Control O.D. X 100

The DPPH radical scavenging activity was measured by \( IC_{50} \) value which represents the effective concentration of the extract at which DPPH radical scavenging ability up to 50%.

**ABTS Radical Scavenging Activity:**

Free radical scavenging activity of EOs was determined by ABTS radical cation decolorization assay (Re et al., 1999). This assay is based on the inhibition by antioxidants of the absorbance at 734 nm of the free radical cations generated from ABTS. ABTS was incubated with potassium persulfate in order to produce the free radical cations. Per cent inhibition of absorbance at 734 nm was calculated and expressed as the percentage of inhibition. \( IC_{50} \) was the effective concentration at which 50% of ABTS was scavenged. Tests were carried out in triplicate.

\[
\text{ABTS} + \text{scavenging effect (}) \%\text{)} = \frac{(\text{AB} – \text{AA})}{\text{AB}} \times 100
\]

Where, AB is absorbance of ABTS radical + methanol; AA is absorbance of ABTS radical + sample extract/standard. Ascorbic acid was used as standard substance.

**Ion Chelating Activity:**

The Metal chelating capacity of methanol extract was measured by the method described by Kumari et al. (2016). 0.1 mM FeSO\(_4\) and 0.25 mM of ferrozine, forming a Fe\(^{2+}\)-ferrozine complex, were subsequently added into 0.2 ml of the extract. After incubation at room temperature for 10 min, absorbance of the mixture was measured at 562 nm. Ethylenediamine tetraacetic acid (EDTA) was used as a positive control. The percentage of chelating activity was calculated in triplicate.

**Total Antioxidant Capacity (Phosphomolybdate assay):**

Total antioxidant activity of the extract was evaluated by the phosphomolybdate method using ascorbic acid as a standard (Prito et al., 1999). The assay is based on the reduction of Mo (VI)-Mo(V) by the extract and subsequent formation of a green phosphate/Mo(V) complex at acidic pH. 0.5ml of extract in different concentrations ranging from 10-100 μg/ml were added to each test tube individually containing 1 ml of distilled water and 1 ml of Molybdate reagent solution, 1mL of Sodium phosphate and 1 ml of Sulphuric acid were added separately. These tubes were incubated at 95°C for 90 min. After incubation, these tubes were normalized to room temperature for 20-30 min and the absorbance of the reaction mixture was measured at 695 nm. The values were recorded and experiment was conducted in triplicates and values are expressed as equivalent of ascorbic acid in mg per g of extract.

**Antibacterial Activity of Ficus racemosa Fruit Extract:**

**Bacterial strains used to test antimicrobial activity:**

The Methanol extract of *Ficus racemosa* fruit extract were tested against different gram negative (*Escherichia coli* and *Pseudomonas fluorescens*) and gram positive bacteria (*Staphylococcus epidermidis*, *Staphylococcus saprophyticus* and *Streptococcus pneumonia*). All the bacterial and fungal strains mentioned above were obtained from King’s Institute, Guindy, India. The bacterial strains were grown in Muller Hinton broths (MHB) at 37°C and were maintained on Muller Hinton agar (NA) slants.

**Antibacterial Analysis:**

Evaluation of antibacterial activity of *Ficus racemosa* fruit methanol extract dissolved in dimethyl sulfoxide (DMSO) was evaluated by agar well diffusion method. The bacterial culture of 0.5 McFarland Standards giving a final inoculum of 1.5 × 10⁸ CFU/ml was uniformly spread on the surface of the muller hinton agar using sterile cotton swabs. The wells were punched with the cork borer (6 mm) in the agar. Each well was filled with varying concentrations from 50, 75 and 100 μg/ml of the samples with positive control as streptomycin 25 mcg, allowed to stand at room temperature for about 2 h and incubated at 37 °C for 24 h for bacteria. After incubation, plates were observed for the formation of a clear zone around the well which corresponds to the antibacterial activity of the tested samples. The zone of
inhibition (ZOI) was observed and measured in mm. All analysis was carried out in triplicates and results are expressed as mean ± SD.

Statistical analysis:
All measurements were performed in triplicate and expressed as mean ± standard deviation. Results of each analysis were expressed as mean ± Standard deviation (n=3). The obtained data were subjected to statistical analysis using Origin 8. P-values less than 0.05 (P<0.05) were considered statistically significant.

Results and Discussion
The present study was designed to examine the effects of methanol extract of *F. racemosa* fruit on the total phenolic and flavonoid contents along with antioxidant and antibacterial activities using in vitro model systems.

Qualitative phytochemical tests:
The qualitative phytochemical compounds present in methanol extract of *Ficus racemosa* fruits were analyzed (Table 1). It showed the presence of flavonoids, alkaloids, tannins, saponins, steroids, terpenoids and phenols. Alkaloids extracted from methanol extract indicated that fruits of *Ficus racemosa* have a good anti-hyperglycemic, anti-cancer, and anti-asthma. Flavonoids recovered in methanol extract served as anti-oxidant, anti-inflammatory and anti-viral. Presence of tannin in extract clearly evidenced that they have antibacterial property (Hisanori et al., 2001). Apart from these, other metabolites present in fruits of *Ficus racemosa* were found to be phenol and saponins etc. (Bagyalakshmi et al., 2019). In most cases, the presence of phytochemicals in plant extract is crucial for the defensive mechanisms of plants (Vazir et al., 2014).

Quantitative Analysis:
Total Phenolic Content:
Phenolic compounds are significant plant constituents with redox characteristics responsible for antioxidant activity (Aryal et al., 2019). Free radical scavenging is facilitated by the presence of hydroxyl groups in plant extracts. As a basis, total phenolic content (TPC) was measured using the Folin–Ciocalteu reagent in methanol extract. The results are expressed in gallic acid equivalents (GAE) per g dry extract weight (Table 2). The content of phenolic compounds in methanol extract was found to be 73.66 ± 3.92 μg GAE/mg sample.

The extraction procedures and solvents play an important role in dissolving the endogenous compounds of the plants (Siddhuraju et al., 2003). Furthermore, plant components can have either polar or non-polar natures. Due to this reason, methanol was chosen as the extraction solvent because phenolic compounds are more soluble in polar organic solvents due to the presence of a hydroxyl group (Wang et al., 2006).

Total Flavonoid Content:
As a basis quantitative determination, flavonoid contents in selected fruit extract were determined using aluminium chloride method. The results were expressed in quercetin equivalents (QE) per g dry extract weight (Table 2). The flavonoid content in methanol extract was 79.08±0.53 μg QE/mg. The quantity and position of free OH groups determine the potency of flavonoids which are secondary metabolites with antioxidant activity.

Antioxidant Potential:
As antioxidant therapy has become increasingly important in the treatment of multiple metabolic disorders (such as diabetes mellitus, arthritis, cancer, ageing, liver dysfunction, etc.) where free radicals are concerned. Scientific research programmes have been conducted worldwide to examine the therapeutic potential of plants for their strong antioxidant properties (Auddy et al., 2003; Shreshtha et al., 2013; Eshwarappa et al., 2015).

Evaluating the antioxidant capacity of compounds using just one assay is inconclusive, due to the complexity of polyphenols and
Table 1: Qualitative phytochemicals tests of *F. racemosa*

<table>
<thead>
<tr>
<th>Phytochemical</th>
<th>Methanol Extract</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flavonoids</td>
<td>+</td>
</tr>
<tr>
<td>Phenols</td>
<td>+</td>
</tr>
<tr>
<td>Alkaloids</td>
<td>+</td>
</tr>
<tr>
<td>Terpenoids</td>
<td>+</td>
</tr>
<tr>
<td>Steroids</td>
<td>+</td>
</tr>
<tr>
<td>Saponins</td>
<td>+</td>
</tr>
<tr>
<td>Tannins</td>
<td>+</td>
</tr>
<tr>
<td>Fixed oil</td>
<td>-</td>
</tr>
</tbody>
</table>

Table 2: Total phenolic and total flavonoid content of *F. racemosa* fruit extract

<table>
<thead>
<tr>
<th>Fruit Extract</th>
<th>Total Phenolic Content (mg of GAE/g)</th>
<th>Total Flavonoids Content (mg of QUE/g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Methanol</td>
<td>73.66±3.92</td>
<td>79.08±0.53</td>
</tr>
</tbody>
</table>

GAE = Gallic acid equivalent; QUE= Quercetin equivalent

![Fig. 1: DPPH scavenging activity of methanol extract of fruit of *Ficus racemosa*.](image)

It is generally accepted that plant antioxidant activity is proportional to the amount of biologically active compounds present (flavonoids, phenolics, phenylpropanoids, etc. [Su et al., 2012; Kasangara et al., 2015; Chen et al., 2020]).

DPPH and ABTS Radical Scavenging Assay:

The DPPH method is faster than other methods and can be useful in the investigation of novel antioxidants for estimating radical scavenging abilities rapidly. This method is sensitive and requires small sample amounts. The percentage DPPH scavenging was calculated and plotted. As shown in Figure 1, methanolic extract of *Ficus racemosa* fruit exhibited a dose dependent DPPH scavenging activity, which was comparable to that of standard quercetin. To quantify the antioxidant...
potential, IC50 values were calculated (Table 3). The methanol extract of fruit had significant antioxidant activity with IC50 of 73.71 μg/ml and showed a maximum percentage inhibition of 67% at a concentration of 100 μg/ml. Methanolic fruit extract inhibited DPPH radical scavenging significantly in a dose-dependent manner. The percentage inhibition increased with the concentration of methanol fruit extract.

**ABTS Radical Scavenging Activity:**

The ATBS (2,2-azino-bis-(3-ethylbenzthiazoline-6-sulphonic acid) radical-scavenging effects of methanolic fruit extract of *Ficus racemosa* were measured in different concentrations (10–100 μg/ml) compared with standard ascorbic acid (Fig. 2) and the IC50 values were tabulated and depicted in Table 3. Therefore, in the present study the methanol extract exhibited highest ATBS radical-scavenging activity (83%) and the lowest IC50 (59.50 μg/ml), as compared to ascorbic acid used as an antioxidant standard. The results indicated that the methanol extract possesses potent ABTS scavenging activities.

These findings suggest that methanol extracts of *Ficus racemosa* fruit have a noticeable effect on free radical scavenging, which can be attributed to the high phenolic and flavonoids constituents present (Table 2). Phenolic and flavonoid antioxidants are secondary metabolism products in plants, and their antioxidant activity is primarily due to their redox properties and chemical structure, which can be important in chelating transitional metals, inhibiting lipoxygenase, and scavenging free radicals (Eshwarappa et al., 2015; Salehi et al., 2020). Phenolic compounds are also good antioxidants because they are effective hydrogen donors (Rice-Evans et al., 1995). In addition, compounds such as...
flavonoids, which contain hydroxyl functional groups, are responsible for the antioxidant effects of plants (Das et al., 1990).

**Ion chelating activity:**

The antioxidant activity of phenolic compounds on methanolic extract of *Ficus racemosa* fruit was attributed by their ability to chelate transition metal ions, such as those of iron and copper. These chelating substances may complex pro-oxidative metal ions to stabilise them in physiological systems (Pukar Khanal et al., 2020). The ion chelating activity was determined using EDTA standard on the methanolic extracts which is presented in Figure 3. The metal chelating capacity was found to be 76.92 % at a concentration of 100 μg/ml with IC$_{50}$ value at a concentration of 72.35 μg/ml. It is evident from the results that *F. racemosa* have the ability to chelate metals, which may serve as protection against oxidative damage brought on by metal-catalyzed breakdown reactions.

**Total antioxidant Capacity:**

The total antioxidant capacity of extracts has often been assessed using the phosphomolybdate method. In the presence of the extracts, the Mo(VI) is reduced to Mo(V) and forms a green coloured phosphomolybdenum(V) complex which shows maximum absorbance at 590 nm. In this study, *F. racemosa* fruit extract exhibited significant (p < 0.05) dose dependent increase in total antioxidant activity with an optical density of 0.934 ± 0.06 at 100 μg/ml. The result was compared with the ascorbic acid standard (1.15±0.02) at 100 μg/ml as show in Figure 4.

**Antibacterial Activity:**

The antibacterial activity of *F. racemosa* (fruit) methanol extract was determined against five pathogenic bacteria strains (three gram positive and two gram negative bacteria). The extracts of the studied plants exhibited varying degrees of inhibition activity against the tested bacteria; and the results were expressed in terms of the diameter of the growth-inhibition zone (clear zones) which was measured in millimeters as shown in Figure 5 and Table 4. Well diffusion method was performed with methanol extract at the concentration of 50, 75 and 100 μg/ml. From the antibacterial test results higher activity was noted at 75 and 100 μg/ml of methanol extract of *F. racemosa*.

The results clearly showed that tested bacteria were susceptible to the methanol extract. There were significant differences (p<0.05) in mean diameter inhibition zone. *F. racemosa* fruit methanolic crude extract showed high activity against *S. pneumoniae* (21 mm), *S. sarophytus* (18 mm) and moderate activity against *P. fluorescens*.
Fig. 4: Total antioxidant capacity (TAC) of *F. racemosa* fruit (methanol) extract.

Table 4: *In vitro* antibacterial activities of Methanol extract of *Ficus racemosa* fruit determined by well diffusion method

<table>
<thead>
<tr>
<th>Test organisms</th>
<th>Concentration (µg/ml)</th>
<th>Zone of Inhibition (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Fruit</td>
</tr>
<tr>
<td><em>Staphylococcus saprophyticus</em></td>
<td>50</td>
<td>13±0.02</td>
</tr>
<tr>
<td></td>
<td>75</td>
<td>15±0.013</td>
</tr>
<tr>
<td></td>
<td>100</td>
<td>18±0.15</td>
</tr>
<tr>
<td><em>Staphylococcus epidermidis</em></td>
<td>50</td>
<td>10±0.0012</td>
</tr>
<tr>
<td></td>
<td>75</td>
<td>14±0.004</td>
</tr>
<tr>
<td></td>
<td>100</td>
<td>17±0.10</td>
</tr>
<tr>
<td><em>Streptococcus pneumonia</em></td>
<td>50</td>
<td>8±0.024</td>
</tr>
<tr>
<td></td>
<td>75</td>
<td>12±0.01</td>
</tr>
<tr>
<td></td>
<td>100</td>
<td>21±0.34</td>
</tr>
<tr>
<td><em>Escherichia coli</em></td>
<td>50</td>
<td>10±0.08</td>
</tr>
<tr>
<td></td>
<td>75</td>
<td>11±0.07</td>
</tr>
<tr>
<td></td>
<td>100</td>
<td>14±0.14</td>
</tr>
<tr>
<td><em>Pseudomonas fluorescens</em></td>
<td>50</td>
<td>8±0.10</td>
</tr>
<tr>
<td></td>
<td>75</td>
<td>14±0.01</td>
</tr>
<tr>
<td></td>
<td>100</td>
<td>17±0.00</td>
</tr>
</tbody>
</table>

Values are expressed as mean±SD
Fig. 5: Antibacterial activity of *Ficus racemosa* fruit (methanol) extract against different bacterial strains measured as zone of inhibition (mm) by well diffusion method.

(17 mm), *E. coli* (14 mm), and *S. epidermidis* (17 mm) at concentration of 100 μg/ml.

Our study revealed that fruit extract was found to have superior inhibitory activity against bacteria. Thus, the fruit extract of *Ficus racemosa* can be used as an alternative antibacterial drug against pathogenic bacteria without having any side effects.

**Conclusion**

This research has unveiled that *F. racemosa* fruit extract, which has been reported to be commonly utilized in traditional medical systems, has a significant amount of phytochemicals and also possesses antioxidant and metal chelating capacities. The phytochemical analysis of *F. racemosa* fruit have showed that they are rich in source of phenolics and flavonoid compounds. The presence of these compounds exhibited potent antioxidant and antibacterial activity. The fruit of this plant in methanol extract showed higher activity in arresting growth of both gram positive and gram negative pathogenic bacteria. The results of this study suggested that *F. racemosa* fruit could be a great natural source for the development of novel therapeutics for the treatment of bacterial pathogenesis-induced inflammation and wounds.

**References**


Channabasavaraj KP, Badami S and Bhojraj S. (2008)


Siddhuraju P and Becker K. (2003) Antioxidant properties of various solvent extracts of total phenolic constituents from three different species of Ficus glomera...


