Anti-Bacterial Activity of *Ficus benghalensis* (Banyan) Fruit Extract Against Different Bacteria

*S. Gaherwal*

Department of Biotechnology, Govt. Holkar Science College, Indore (M.P.), India

**Abstract:** The present paper describes the in-vitro antibacterial activity of banyan (*Ficus benghalensis*) fruit on the basis of inhibition zone. The aqueous, methanol and ether extract of fruit was used to test its antibacterial activity by disk diffusion method against *E. coli*, *S. typhi* and *L. acidophilus*. Results obtained show the positive antibacterial activity of aqueous extract of fruits for all the three bacteria and highly response showed against *E. coli*. Methanol extract of fruit extract was most effective for *E. coli* and no response showed against *S. typhi* and *L. acidophilus*. Ether extract of fruit show the positive antibacterial activity for all the three bacteria and highly bactericidal for *L. acidophilus*.

**Key words:** Antibacterial Activity · Banyan · *E. coli* · *S. typhi* and *L. acidophilus*

**INTRODUCTION**

Human has for centuries used many species to treat several diseases[1]. According to Famboi[2] medicinal plants have continuously to play a dominant role in the maintenance of human health since ancient times. The medicinal value of plants lies in some chemical substances that produce a definite physiological action on the human body. The present investigation was done to study the susceptibility of microorganisms like *E. coli*, *S. typhi* and *L. acidophilus* towards banyan fruit in different extracts.

**MATERIALS AND METHODS**

**Material Collection:** The banyan fruits were collected from the campus of Holkar Science College, Indore (M.P.) India, in between the months of January to March, 2009. The fruits were washed with distilled water, then dried under the incubator at 37° temperature for 2-3 days until it become totally dried.

**Extract Preparation:** The extracts were prepared in three solvent i.e. aqueous, methanol and ether. The 10 grams powder of fruit was dissolved in 100ml of different solvent. Aqueous solvent heated until it becomes nearly half i.e. approximately 50% and Methanol and Ether solvent kept for over night. It was then filtered in a test tube with the help of Wateman Filter No. 1. Filtered solution was centrifuged at 200 rpm for two minutes. The supernatant which contain clear fresh extract of fruit of banyan was used for experimental work.

**Media Preparation:** The Muller Hinton media was used to test microorganism susceptibility.

**Media Composition:** (Typical, g/l)
- Meat infusion-2.0
- Casein hydrolysate-17.5
- Starch-1.5
- Agar -agar- 17.0

**Media Preparation Method:** 38 gm of Mueller Hinton dehydrated media was suspended in 1000ml of purified distilled water. It was heated with frequent agitation and boiled for 1 minute. Sterilized at 121°C (15lbs of pressure) for 15 minutes. Cooldown to 45-50°C. Mixed gently and poured into previously sterile Petri plates by autoclaving. Plates were clear to opalescent and brownish yellow.

**Disk Preparation:** E-270 (diameter 12.5) paper was cut into a shape of disk and then sterilized into incubator for
overnight. These disk were placed into prepared extract of experimental fruit extract for 20 minutes respectively, then removed with the help of a sterile forceps and placed into a separate sterile Petri plates, allow drying in laminar air flow.

**Inoculums Preparation:** From a stocked pure bacterial sample, 4-5 colonies were transferred with a wire loop to 10 ml of distilled water in test tube.

**Inoculums Preparation:** Disk diffusion method was used to test the antibacterial activity of Banyan fruit extract against the experimental bacteria.

**RESULT AND DISCUSSION**

The aqueous extract of fruit was most effective against the treatment of *E. coli* followed by *S. typhi* and *L. acidophilus*. The order of zone of inhibition was observed as *E. coli*, *S. typhi* and *L. acidophilus*. The methanol extract shows result only against the *E. coli*. It did not give inhibition zone in *S. typhi* and *L. acidophilus*. The order of zone of inhibition was observed as *E. coli*. The ether extract was found to exhibit the maximum zone of inhibition in *L. acidophilus* followed by *E. coli* and *S. typhi*. The order of zone of inhibition was observed as *L. acidophilus*, *E. coli* and *S. typhi*.

On comparison in extract *E. coli* gave best result in aqueous extract followed by methanol and ether. The order of zone of inhibition was observed as aqueous, methanol and ether. The *S. typhi* was found to give same result in aqueous and ether extract. There was no effect of methanol extract. The order of zone of inhibition was observed as aqueous and ether. For *L. acidophilus* ether extract was most effective followed by aqueous. It shows no result in methanol. The order of zone of inhibition was observed as ether and aqueous.

The overall result of fruit shows that *E. coli*, aqueous extract was most effective for *S. typhi*, aqueous and ether gave same zone of inhibition. For *L. acidophilus* ether extract gave best result.

Ahmad [3] studied antibacterial activity of ethanolic extract to 22 traditionally used Indian medicinal plants against 7 bacteria including *S. typhi*, *E. coli* and found 10 plants with antibacterial activity. Naqvi [4] found aqueous extract of plant as antibacterial including *E. coli*, *S. typhi*. Gaherwal [5, 6] studied the antibacterial activity of *Eucalyptus* against *E. coli*, *S. typhi* and *L. acidophilus*. In the present investigation too, aqueous extract of fruit of banyan was found most effective against *E. coli* and methanols extract shows result only against the *E. coli* and ether extract was found to exhibit the maximum zone of inhibition in *L. acidophilus*. The results of present study corroborate with above mentioned authors.

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Organism</th>
<th>Aqueous extract (10%)(10 gm/100 ml)</th>
<th>Methanol extract (10%)(10 gm/100 ml)</th>
<th>Ether extract (10%)(10 gm/100 ml)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td><em>E. coli</em></td>
<td>8 mm</td>
<td>6 mm</td>
<td>5 mm</td>
</tr>
<tr>
<td>2.</td>
<td><em>S. typhi</em></td>
<td>6 mm</td>
<td>No result</td>
<td>5 mm</td>
</tr>
<tr>
<td>3.</td>
<td><em>L. acidophilus</em></td>
<td>5 mm</td>
<td>No result</td>
<td>7 mm</td>
</tr>
</tbody>
</table>

![Fig. 1: Antibacterial activity of banyan (Ficus benghalensis) fruit extract on different bacteria](image-url)
REFERENCES


