ANTIMICROBIAL ACTIVITY OF ZIZYPHUS JUJUBA LAMK. LEAF

Meenakshi Vaidya*

SVKM'S Mithibai College, Department of Botany, Vile-Parle West, Mumbai 400 056, India.

ABSTRACT
Herbs are staging a comeback and herbal ‘renaissance’ is happening all over the globe. Over –three quarters of the world population relies mainly on plants and plant extract. Plants have been used by mankind to treat various diseases and disorders. Medicinal plants, which are found on earth, have renowned medicinal significance and their usage is increasing day by day in our daily life. Medicinal plants have curative properties due to the presence of various complex. The plant Ziziphus jujuba Lamk. is used medicinally for a wide number of ailments and so it was selected. It chemically contains flavonoids, saponins, tannins, vitamin A, vitamin B, sugars, mucilage, calcium, phosphorus, iron. In the present study antimicrobial activity of the leaves of Zizyphus was studied using Pseudomonas aeruginosa, Escherichia coli & Staphylococcus aureus was observed.

KEYWORDS: Ziziphus jujuba, traditional medicine, antimicrobial, Pseudomonas aeruginosa, Escherichia coli, Staphylococcus aureus.

INTRODUCTION
Ziziphus jujuba Lamk. belongs to family Rhamnaceae. (Hooker, 1883).

Common names: Chinese date, Indian Cherry, Ber, Bore, Badari, Kuvali, Berra, Boyedi, Gabartagi, Phalashayshira etc.
Ziziphus jujuba is a medium sized, fast growing, deciduous spiny tree with dense spreading crown. Leaves are variable with greenish yellow flowers. Fruits are green and turn pale yellow when ripe. The roots go deep into the earth. The bark is dark grey in colour, rough and deeply furrowed. Branches are usually armed with spines, mostly in pairs, one straight and other curved. Young shoots are more or less densely pubescent (Sharma, 1993).

The plant Ziziphus jujuba chemically contains flavonoids, saponins, tannins, vitamin A, vitamin B, sugars, mucilage, calcium, phosphorus, iron. The leaves contain alkaloids such as coclaurine, isoboldine, norisoboldine, asimiloboldine, iusiphine and iusirine (Singh & Lal, 1982). Flavonoids such as Quercetine, Kaempferol, Rhamnoside, Isospinin are present in the leaves (Kapoor, 1990).

USES
The leaves are used for hypoglycemic effects, as a diuretic, emollient, expectorant, anticancer, sedative, blood purifier, and in treatment of diarrhoea. (Kirtikar & Basu, 2006).

Antimicrobial activity of Eclipta prostrata has already been studied by Vaidya & Sambhare, 2016. Vaidya, 2015, has studied antimicrobial activity of Holarrhena antidysenterica & antimicrobial activity of Helicteris isora has also been observed by Vaidya, 2015. Antimicrobial activity of aqueous & methanolic extract of young and mature leaves of Psidium guajava (Guava) by Vaidya, 2013.

MATERIAL AND METHODS
Collection: The fresh plant material of Ziziphus jujuba was collected from Dahanu, District – Thane; Borivali, Mumbai & authenticated.
Agar cup method

The agar cup method was used to study the antibacterial activity of the extracts. Bacterial culture from culture plates were scooped using a wire loop and separately mixed with normal saline. A loopful was withdrawn and was mixed with the agar broth and then was poured in petriplate until the agar solidified. Wells of approximately 6mm in diameter and 2.5mm deep were made on the surface of the solid medium using a sterile borer. The extracts were inoculated in the well having the concentration 200, 400, 600, 800 & 1000 µg/mL. Solvent blank was also inoculated. The plates were incubated at 37°C for 24 hours. After 24 hours, the plates were removed and zones of inhibition measured and the results were tabulated. Extracts with zone of inhibition greater or equal to 7mm diameter were regarded as positive.

The cultures used were:

*Escherichia coli* (NCIM - 2066), *Staphylococcus aureus* (NCIM - 5021), *Pseudomonas aeruginosa* (NCIM - 2036) were used as test organisms. All these bacterial culture were grown at 37°C and maintained at 4°C on nutrient agar slants.

**Observations**

The organisms tested showed the following results

<table>
<thead>
<tr>
<th>Sr. No</th>
<th>Name of organism</th>
<th>Blank (DMSO)</th>
<th>200 (ppm)</th>
<th>400 (ppm)</th>
<th>600 (ppm)</th>
<th>800 (ppm)</th>
<th>1000 (ppm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td><em>Pseudomonas aeruginosa</em></td>
<td>-</td>
<td>11</td>
<td>12</td>
<td>13</td>
<td>14</td>
<td>14</td>
</tr>
<tr>
<td>2.</td>
<td><em>Escherichia coli</em></td>
<td>-</td>
<td>13</td>
<td>13</td>
<td>14</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>3.</td>
<td><em>Staphylococcus aureus</em></td>
<td>-</td>
<td>13</td>
<td>13</td>
<td>14</td>
<td>15</td>
<td>16</td>
</tr>
</tbody>
</table>

- Indicates no growth, zone of inhibition in mm

*Pseudomonas aeruginosa*  *Escherichia coli*
RESULTS
Zones of inhibition of different treatment groups were measured and compared. Statistical comparison of individual extract and combined extract was seen. It was found that effects of the extracts was in the order of 200 < 400 < 600 < 800 < 1000 µg/mL. Since the extracts were crude higher concentration showed maximum activity.

DISCUSSION
Medicinal plants are gaining importance in the perspective of modern medicine. Individual parts of the medicinal plant have distinct characteristics. Medicinal plants have no side effects when used for the treatment of specific disorders. Taking into consideration the fact that since more than 7500 species are being used in healthcare, the present work is a small contribution in suggesting that the leaves of Zizyphus are having antimicrobial activity & could be tapped as a potential source of the same.

BIBLIOGRAPHY
4. Lal Satish Narain & Meenakshi Singh (1982); Medicinal plants of India, Page no 34.