Comparative Study of the roots of the plants

*Ziziphus oenoplia* and *Ziziphus jujuba*

Priyanka Singh, Mayank Tiwari, Sanjay Yadav, Shashi Prabha Dubey

**ABSTRACT**

Aim of present study is to evaluate *Ziziphus oenoplia* and *Ziziphus jujuba* by its Pharmacognostically and Phytochemically with different parameter in order to give possible scientific validation. The roots are astringent, bitter, antihelminthic, digestive and antiseptic. They are useful for treating hyperacidity, ascariasis infection, abdominal pain and healing of wounds. Jujuba leaves are also used in the treatment of fever and its fruit are effective in herbal remedies. It aids weight gain and improve muscular strength stamina and roots are also effective in antibacterial, antifungal. A thick root was studied. Transverse section of roots was circular in outline. Outer circular layer of cork was followed by thin walled epidermal cells. Xylem around the well-developed xylem cells and also done the powder microscopy of root powder and shows the fibre and polygonal cells.

**Keywords:** *Ziziphus jujuba*, *Ziziphus oenoplia*, Transverse section, Plant powder

1. **Introduction**

A spreading thorny shrub grows up to 1.5 meters in height. Leaves simple, alternate, ovate-lanceolate, acute, oblique, flowers green in subsessile axillary cymes. Fruits globose drupes, black contain single seed. Jujuba small spreading tree, with drooping branches height. 5 to 8 meters trunk girth, 85 cm, bark rough, gray or dull black, irregularly cracked, covered with a thick layer of green moss in the case of older trees.

1.1 **Distribution**

Indian subcontinent, China and Southeast Asia.

1.2 **Macroscopical Characters**

The roots are astringent, bitter, antihelminthic, digestive, and antiseptic. They are useful for treating hyperacidity, ascariasis infection, abdominal pain and healing of wounds. The leaves are simple, alternate, ovate-lanceolate, spreading sometimes climbing, thorny shrub for growing to 1.5 m in height.
<table>
<thead>
<tr>
<th>No.</th>
<th>Features</th>
<th>Observation (Z. oenoplia)</th>
<th>Observation (Z. jujuba)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Color</td>
<td>Yellowish-brown</td>
<td>Yellowish-brown</td>
</tr>
<tr>
<td>2</td>
<td>Odour</td>
<td>Characteristics</td>
<td>Characteristics</td>
</tr>
<tr>
<td>3</td>
<td>Taste</td>
<td>Bland</td>
<td>Acrid</td>
</tr>
<tr>
<td>4</td>
<td>Shape</td>
<td>Cylindrical</td>
<td>Cylindrical</td>
</tr>
<tr>
<td>5</td>
<td>Size</td>
<td>0.5-0.8 cm</td>
<td>0.1-1 cm</td>
</tr>
<tr>
<td>6</td>
<td>Types</td>
<td>Tap root</td>
<td>Tap root</td>
</tr>
<tr>
<td>7</td>
<td>Special Feature</td>
<td>Presence of secondary and tertiary root scars</td>
<td>Presence of secondary and tertiary root scars</td>
</tr>
</tbody>
</table>

2. Material and Methods

Plant Material

Roots of Ziziphus oenoplia was collected from the road sides of Khurdahi bazaar Arjunganj Lucknow in the month of October.

Macroscopic Study

A thick root was studied. It is 1 cm in diameter. Presence of secondary and tertiary root and yellowish brown in colour and its having characteristic odour, acrid taste, and hard texture.

Morphological Features of Ziziphus jujuba and Ziziphus oenoplia root

2.2 Microscopical study: Transverse section of root of Ziziphus jujuba was studied and found cork, air vessels and medullary rays and also found the thin epidermal cells. And transverse section of Ziziphus oenoplia was studied and observe that cork, cortex, cambium and phellogen, medullary rays are present in the structure.

Transverse section of root of Z. jujuba and Z. oenoplia

2.3 Powder Microscopy of root of Z. jujuba and Z. oenoplia: The powder microscopy of Z. oenoplia and Z. jujuba root shows...
starch grain, calcium oxalate crystal, wood, fiber are shown in powder study.

(Powder Microscopy of *Z. jujuba* and *Z. oenoplia* root powder)

2.4 Physicochemical Parameters

**Moisture content of root of *Ziziphus oenoplia* & *Ziziphus jujuba***:

<table>
<thead>
<tr>
<th>S.no.</th>
<th>Quantative standard</th>
<th>% of <em>Z. oenoplia</em></th>
<th>% of <em>Z. jujuba</em></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Moisture content</td>
<td>0.413%</td>
<td>0.545%</td>
</tr>
</tbody>
</table>

2.5 Ash Value

**Ash value of root of *Ziziphus oenoplia* & *Ziziphus jujuba***:

Ash values of sample (n=3).

<table>
<thead>
<tr>
<th>S.no.</th>
<th>Ash value</th>
<th>% of <em>Z. oenoplia</em></th>
<th>% of <em>Z. jujuba</em></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Total ash value</td>
<td>3.83%</td>
<td>6.285%</td>
</tr>
<tr>
<td>2.</td>
<td>Acid insoluble ash</td>
<td>2.325%</td>
<td>4.085%</td>
</tr>
<tr>
<td>3.</td>
<td>Water soluble ash</td>
<td>3.045%</td>
<td>5.138%</td>
</tr>
<tr>
<td>4.</td>
<td>Alcohol soluble ash</td>
<td>3.371%</td>
<td>6.431%</td>
</tr>
<tr>
<td>5.</td>
<td>Sulphated ash</td>
<td>1.865%</td>
<td>4.362%</td>
</tr>
</tbody>
</table>

2.6 Extractive Value

**Extractive values of *Ziziphus oenoplia* & *Ziziphus jujuba***:

Extractive values of Sample (n=3).

<table>
<thead>
<tr>
<th>S.no.</th>
<th>Extractive values</th>
<th>Nature Of <em>Z. oenoplia</em></th>
<th>Nature Of <em>Z. jujuba</em></th>
<th>Colour Of <em>Z. oenoplia</em></th>
<th>Colour Of <em>Z. jujuba</em></th>
<th>Percentage yield of <em>Z. oenoplia</em> % w/w</th>
<th>Percentage yield of <em>Z. jujuba</em> % w/w</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Alcohol soluble extractive</td>
<td>Pasty</td>
<td>Semisolid</td>
<td>Yellowish</td>
<td>Yellowish</td>
<td>15.867%</td>
<td>10.155%</td>
</tr>
<tr>
<td>2.</td>
<td>Water soluble extractive</td>
<td>Pasty</td>
<td>Semisolid</td>
<td>Brownish</td>
<td>Black</td>
<td>20.716%</td>
<td>15.665%</td>
</tr>
<tr>
<td>3.</td>
<td>Chloroform soluble extractive</td>
<td>Pasty</td>
<td>Semisolid</td>
<td>Yellowish</td>
<td>Dark brown</td>
<td>10.224%</td>
<td>7.845%</td>
</tr>
</tbody>
</table>
Color of extract of root in different solvent *Ziziphus oenoplia* and *Ziziphus jujuba*

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>n-hexane</td>
<td>Yellowish green</td>
<td>Yellowish</td>
<td>Semisolid</td>
<td>Liquid</td>
</tr>
<tr>
<td>2.</td>
<td>Diethylether</td>
<td>Blackish brown</td>
<td>Yellowish</td>
<td>Liquid</td>
<td>Liquid</td>
</tr>
<tr>
<td>3.</td>
<td>n-butanol</td>
<td>Dark brown</td>
<td>Yellowish brown</td>
<td>Liquid</td>
<td>Pasty</td>
</tr>
<tr>
<td>4.</td>
<td>Methanol</td>
<td>Brown</td>
<td>Yellowish brown</td>
<td>Pasty</td>
<td>Pasty</td>
</tr>
<tr>
<td>5.</td>
<td>Water</td>
<td>Yellowish</td>
<td>Brown</td>
<td>Semisolid</td>
<td>Pasty</td>
</tr>
</tbody>
</table>

2.7 Phytochemical Screening

The chemical tests on various extracts gives following results.

Phytochemical analysis of successive solvent extract.

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Type of Phytoconstituents</th>
<th>Name of chemical test</th>
<th>Plant extract in different Solvent</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>b. Benedict’s test</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Alkaloid</td>
<td>a. Mayer’s test</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>b. Wagner’s test</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>c. Hager’s test</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>a. Foam test</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>b. Haemolytic test</td>
<td></td>
</tr>
<tr>
<td></td>
<td>b. Saponin glycoside</td>
<td>a. Keller Kiliani test</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>b. Beljet test</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Steroids</td>
<td>a. Salkowski test</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>Protein &amp; Amino acids</td>
<td>a. Ninhydrin test</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>b. Biuret test</td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>Starch</td>
<td>a. Iodine test</td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>Tannins</td>
<td>a. Ferric Chloride test</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>b. Alkaline reagent test</td>
<td></td>
</tr>
</tbody>
</table>

O = Z. oenoplia, J = Z. jujuba
3. Conclusion
On the basis of observation the species of *Zizyphus oenoplia* and *Zizyphus jujuba* Linn. are very little difference. It may also provide suitable criteria to differentiate the root parts used of *Zizyphus oenoplia* and *Zizyphus jujuba* Linn which is widely used in herbal drug industries have been investigated with respect to their morphological and pharmacognostical details and its powder microscopy and others chemical testing.

4. References
26. Jiang JG, Huang XJ, Chen J. Isolation and purification of saponins from *Zizyphus jujuba*
52. Rastogi, Mehrotra. Compendium of Indian Medicinal Plants PID New Delhi, 1985-89, 2, 719.
64. The journal of animal & plant science 2011; 781-786.
81. www.wikkipedia.com
83. “Ziziphus” in flora of china 2007, 12, 119-123.