Case Report

Pharmacognostical, phytochemical and Anti oxidant studies of the aerial parts of *Urena lobata* L.

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The present study is to determine the pharmacognostical phytochemical and antioxidant studies of *Urena lobata* Linn. In Pharmacognostical studies microscopical characteristics of leaf and stem, analytical parameters such as ash values extractive value, analysis of major elements and anti oxidant studies were carried out. The ethanolic and ethyl acetate extracts showed significant DPPH (71.35%, 69.74%) activity compared to chloroform extract (53.85%) at 200 mcg. A biphasic response with ethanolic and ethyl acetate extract (81.94%, 78.30) and a dose dependent antioxidant activity with chloroform extract (42.58%) at 1000 mcg by nitric oxide scavenging.

**Keywords**: *Urena lobata*, Malvaceae, pharmacognostic, phytochemical analysis and antioxidant studies.

INTRODUCTION

Plants are the only economic source of a number of well established and important drugs; in addition they are the sources of some chemical intermediates needed for the production of a number of drugs. The popularity of natural drugs all over the world in recent years is an indication of significant contribution of Pharmacognosy in modern medicine. The present work intends to study the Pharmacognostical, Phytochemical and antioxidant studies of *Urena lobata* Linn.

*Urena lobata* Linn. of Malvaceae family is of medicinal value. It is a shrub of 60-250cm or more height and basal diameter of 7cm (Pharmacognosy of Ayurvedic drug. 1962). This medicinal plant is useful in many diseases, in the form various extracts of leaves and roots. Traditionally the plant is used as diuretic, febrifuge and rheumatism. It is useful for wounds, toothache, gonorrhea and food for animals as well as humans (Mazumder et al., 2001). Aerial parts of *Urena lobata* is reported to contain Mangiferin and Quercetin and roots having imperatonin and furanocoumarin (Keshab 2004).

MATERIALS AND METHODS

Plant material

The plant material *Urena lobata* Linn (Malvaceae) were collected from the Thirunelveli district, Tamilnadu, during the month of February in the year 2010 and authenticated by Dr. V. Chelladurai, Taxonomist, Thirunelveli. A specimen voucher was deposited in the college herbarium for future reference. Fresh drug obtained were shade-dried and coarsely powdered and passed through sieve 100 mesh sizes and stored in air-tight containers for further use.

Pharmacognostical Studies

The histology of the aerial parts and roots of *Urena lobata* was carried as per the standard procedures (Khandelwal et al., 1995). Analytical parameters like ash values,
extractive values, were studied as per the Indian Pharmacopoeia (Indian Pharmacopeia. 1996).

The total ash were dissolved in the mixture of 5ml of HNO$_3$ and 5ml of HCl and made up to 100 ml using HPLC Grade water using certified standard supplied by Merck and Thermo, filtered and analyzed with ICP-AES system.

Standards used

Certified standards supplied by Merck and Thermo.

Preparation of the extracts

The entire plant material of *Urena lobata*, were collected, shade dried and powdered and extracted for 24, 48 and 72 hours continuously using solvents of increasing polarity namely Chloroform, Ethyl acetate and ethanol. All the extracts were filtered through Whatmann filter paper and evaporated on a water bath and finally dried under vacuum.

Phytochemical screening

Preliminary phytoconstituents analysis of the various extracts was carried out using standard procedures and specific reagents (Kokate and Purohit. 1999). Also the quantitative estimation of flavonoids and the tannins were estimated using the standard procedures (Rajpal. 2002; Rajpal. 2002).

Determination of Lipid peroxidase activity

The formation of malondialdehyde is the basis for the well known TBA method used for evaluating the extent of lipid per oxidation. At low pH and high temperature (100$^\circ$) malondialdehyde binds with TBA to form a red complex that can be measured at 532 nm. TBA method was used to measure the carbonyl compound obtained by linoleic acid oxidation at later stage of lipid per oxidation. Absorbance of supernatant was measured at 532nm (Gutteridge 1995). The results were tabulated in table 5.

DPPH Radical Scavenging Activity

Radical scavenging activity was determined with a DPPH as a free radical by using various concentrations (50-1000 mcg/ml) of the extracts (viz Chloroform, Ethyl acetate and ethanol extracts). The decrease in absorbance was measured at 517 nm after 30 minutes of incubation at room temperature. Quercetin was used as standard. Antiradical activity is defined as the amount of inhibitor (Phenolic compound) necessary to decrease the initial DPPH radical concentration by 50 % (EC 50) (Hiruma 1999). The results were tabulated in table 6 and figure 1.

Nitric Oxide (NO) Radical Scavenging Activity

Sample of various concentration were used to determine their effect on the NO radical scavenging activity using sodium nitroprusside generating NO system compared
The microscopical characters of leaf showed stellate trichomes with lignified epidermal cells of trichomes and rosette calcium oxalate crystals. The stem showed periderm, wide secondary phloem with dilated funnel shaped phloem rays, conical bands phloem and phloem fibers along with xylem elements.

**RESULTS**

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Table 1. Estimation of the Percentage of Ash values

<table>
<thead>
<tr>
<th>Total ash</th>
<th>8.31%w/w</th>
</tr>
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<tbody>
<tr>
<td>Acid insoluble ash</td>
<td>2.48%w/w</td>
</tr>
<tr>
<td>Water soluble ash</td>
<td>2.10%w/w</td>
</tr>
</tbody>
</table>

Table 2. Extractive values

<table>
<thead>
<tr>
<th>Water soluble extractive</th>
<th>10.88%w/w</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alcohol soluble extractive</td>
<td>7.2%w/w</td>
</tr>
</tbody>
</table>

Table 3. Analysis of major elements

<table>
<thead>
<tr>
<th>Elements</th>
<th>% ppm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calcium</td>
<td>19.86</td>
</tr>
<tr>
<td>Potassium</td>
<td>14.37</td>
</tr>
<tr>
<td>Sodium</td>
<td>0.41</td>
</tr>
<tr>
<td>Lead</td>
<td>25.4</td>
</tr>
</tbody>
</table>

Table 4. Qualitative Chemical Examination of various extracts.

<table>
<thead>
<tr>
<th>Constituents</th>
<th>Chloroform extract</th>
<th>Ethyl acetate extract</th>
<th>Ethanolic extract</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alkaloids</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Carbohydrates</td>
<td>-</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>Glycosides</td>
<td>-</td>
<td>-</td>
<td>+</td>
</tr>
<tr>
<td>Sterols</td>
<td>+</td>
<td>-</td>
<td>+</td>
</tr>
<tr>
<td>Resins</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Tannin and Phenolics</td>
<td>-</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>Flavonoids</td>
<td>-</td>
<td>-</td>
<td>+</td>
</tr>
</tbody>
</table>

The leaf constants such as stomatal number as 63.33-73.33; stomatal index as 20.5 and the palisade ratio as 3, total ash, acid insoluble ash and water insoluble ash were found to be within the limits prescribed in Ayush guidelines and recorded in Table 1 and extractive values are tabulated in Table 2.

Major elements determined from the ash of *Urena lobata* (entire) are Ca, K, Na, Pb. The amount of elements present is noted in Table 3.

The preliminary Phytochemical work on *Urena lobata*, showed that it contains sterols, tannins in the ethanolic extract and flavonoids in Chloroform extract, phenols and tannins in ethyl acetate extract. The amount of flavonoids was found to be 1.15%w/w and tannins as 0.45%w/w. The qualitative chemical analysis results were recorded in Table 4.

Both the ethanolic and ethyl acetate extracts showed significant antioxidant activity in all invitro free radical scavenging models when compared to chloroform extract. Invitro DPPH radical scavenging activity, the percentage inhibition was 71.35%, 69.74% and 53.85% in ethanol, ethyl acetate and chloroform extracts at 200 mcg/ml when compared with curcumin at 62 mcg/ml showed only 84.7% inhibition. The ethanol and ethyl acetate extracts showed a biphasic response where as the chloroform extract showed a dose dependent increase in the activity. In case of nitric oxide scavenging activity, the ethanol extract showed 81.94%, ethyl acetate extract showed 78.30 % and the chloroform extract showed 42.58 % inhibition at 1000mcg/ml compared with 88.02 % inhibition by Quercetin. Both the extracts showed a dose dependent increase in activity. A dose dependent increase in total antioxidant activity was shown by ethanolic extract. Thus the antioxidant potential of the extract of *U.lobata* L may be due to the presence of polyphenolic compounds, which needs further analysis.

**CONCLUSION**

The present study was carried out to establish the identification of *Urena lobata*. Phytochemical screening showed the presence of sterols, tannins, flavonoids. The presence of flavonoid like compounds in *Urena lobata* can be used as antioxidant drug. The present work can be concluded that, this traditional herb may represent new source of antioxidant, immunomodulatory, wound healing as well as antimicrobial with stable biologically active components that can establish a scientific base for the use of plants in modern medicines.
ACKNOWLEDGEMENT

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REFERENCES

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