

Research Article

Pharmacognostical and preliminary phytochemical studies of *Urena lobata* linn

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Abstract

In the present study was to determine the pharmacognostical and preliminary phytochemical analysis of *Urena lobata* Linn. In pharmacognostical studies powder characteristics of leaf and stem, leaf constant and analytical parameters like ash values extractive value analysis of major elements and in preliminary phytochemical studies were carried out. All these characters were determined will help the researches in their phytochemical as well as pharmacognostical analysis of this species.

Keywords *Urena lobata* Linn, Malvaceae, pharmacognostic, phytochemical analysis

Introduction

Plants are the oldest form of health care known to mankind. Herbal medicine sometimes referred to as Herbalism or botanical medicine, for therapeutic or medicinal value. With the advent of European scientific methods many of the reputed medicinal plants came under chemical scouting leading to the isolation of active principles. Soon after their isolation and characterization, these compound either in pure state or in the form of well characterized extracts, became a part of pharmacopeias of several countries [1]. Historically the botanical emphasis in pharmacognosy started in the early 1900s out of a need to establish the quality of and adulterants in plant and animal drugs. Initially the pharmacognosist engaged in his pursuit with the aid of his five senses reinforced at time with the microscope and few chemical reaction. Thus up to the beginning of 20th century pharmacognosy was more a descriptive subject mainly of botanical science and involved identification of drugs both in entire or powdered condition by

macroscopic and microscopic studied. All of the useful crude drugs have been thoroughly studied botanically and histological thus botanically oriented sciences of pharmacognosy became stagnant.

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 [2]. This medicinal plant is useful in many diseases, in the form various extracts of leaves and roots. Traditionally the plant being used as diuretic, febrifuge and rheumatism. It is useful for wounds, toothache, gonorrhoea and for food for animals as well humans [3]. Aerial parts of *Urena lobata* contain Mangeliferin and quercetin and roots having imperatorin and furcoumarin were isolated [4].

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. Pharmacognostists today also continue to work in the direction of their

predecessors in establishing standards where by quality of commercial plant material can be maintained. With the slogan of World Health Organization "Health for all by year 200 A.D", it is apparent that all system of traditional medicines prevailing in the world need to be encouraged if we intend to find cure for those diseases when modern synthetic medicines have failed or where modern synthetic drugs are beyond the reach of the poor nations. Thus natural sources of drugs are required to be exploited more and more. Thus 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 pharmacognosy and preliminary phytochemical screening of *Urena lobata* Linn.

Materials and Methods

Plant material

The plant material *Urena lobata* Linn (Malvaceae) were collected from the Herbal Garden Division of Kerala Ayurveda Limited, Aluva, Kerala and authenticated by Dr. K.V. George, Research Guide, School of Environmental Sciences, Departement of Botany, CMS College, Kottayam. A specimen voucher was deposited in the college Hebarium for future refernces. Fresh drug obtained were sun-dried and coarsely powdered and passed through sieve 100 mesh size and stored in air -tight containers for further use.

Pharmacognostical Studies

In pharmacognostical study, the leaf constants, stomatal number, stomatal index and palisade ratio were carried out using standard procedures [5]. Analytical parameters like ash values, extractive values, were studied using various reagents and were determined as per the Indian Pharmacopeiea [6]

Analysis of ash for major elements

The given sample was dissolved in the mixture of 5ml of HNO₃ and 5ml of HCl and made upto 100

ml using HPLC Grade water. The filtered sample was analysed with ICP-AES system.

Standards used

Certified standards supplied by Merck and Thermo.

Preparation of the extracts

The entire plant material of *Urena lobata*, stem, leaf and root were collected shade dried and powdered separately .A weighed quantity of each plant parts were extracted for 6hours in soxhlet apparatus using suceessive extraction by different solvents of polarity namely petroleum ether, ethanol and water.

Phytochemical screening

Preliminary phytoconstituents analyses of the extracts were carried out using standard procedures and specific reagents [7].

Estimation of phytoconstitutents

Estimation of Flavonoids [8].

3gm of the extract was refluxed with 50ml of alcohol on a water bath for half an hour and filter. The above process was repeated twice or till bitterness is observed in the residue. The filtrate was evaporated under vacuum and the residue was repeatedly taken up with 25, 15 and 15 ml of water and the above aqueous extract was shaken repeatedly with 25, 50, 15 and 15 ml of ethyl acetate extract and collect the ethyl acetate layer and washed with water. Evaporated to dryness and weighed.

$$\%age \text{ of Flavonoids} = \frac{\text{Final weight}-\text{Initial weight}}{\text{Weight of the sample}} \times 100$$

Estimation of Total Tannins [9]

1.0 gm of the extract powder was taken in a 100ml volumetric flask and 50ml hot water was added with constant shaking. When powder goes completely in solution, the volume was made up with distilled water. Filtered through whatman filter paper No.14.10 ml of resulting solution was pipetted out in 1000ml conical flask, add 750ml

distilled water and stir the contents. Added 25 ml freshly prepared indigo sulphonic acid and diluting to 1000ml with water. The solution was titrated with constant stirring against 0.1 N potassium permanganate solution to golden yellow colour as the end point (Vs). A blank test was performed by titrating 25 ml of indigo sulphonic acid in 750 ml distilled water (Vb). Each ml of 0.1N potassium permanganate solution was equivalent to 0.004157g of tannin compounds calculated as tannic acid.

$$\text{Percentage of Total Tannins} = \frac{(V_s - V_b) \times N \times 0.004157 \times 100}{0.1 \times \text{Weight of the sample}}$$

Results

The present study, in the pharmacognostical work shows the leaf constants the stomatal number is 63.33-73.33, stomatal index is 20.5 and the palisade ratio 3. In analytical parameters Total ash value, Acid insoluble ash and water insoluble ash were determined and recorded in Table 1 and Extractive values are tabulated in Table 2.

Table 1: Estimation of the Percentage of Ash values

Ash	Powdered leaves	Powdered Stem	Powdered root
Total ash	8.31% w/w	2.35% w/w	6.73% w/w
Acid insoluble ash	2.48% w/w	0.38% w/w	0.15% w/w
Water soluble ash	2.10% w/w	2.02% w/w	1.02% w/w

Table 2: Extractive values

Extractive values (%w/w)	leaf powder	Stem powder	Root powder
Water soluble extractive	11.94	6.003	4.015
Alcohol soluble extractive	6.7	7.71	3.009

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

Table 3: Analysis of major elements

Elements	Avg (% ppm)
Ca	19.86
K	14.37
Na	0.41
Pb	25.4

The preliminary phytochemical work on *Urena lobata*, shows the ethanolic extract of *Urena lobata* leaf was found to contain sterols. Tannins are present in the ethanolic extract of *Urena lobata* leaf. Petroleum ether extract of plant leaf, stem and ethanolic extract of *Urena lobata* were found to contain flavonoids by qualitative chemical examination. The amount of flavonoid present in the methanolic extract of *Urena lobata* was found to be 1.15% w/w and tannins 0.45% w/w. The quantitative chemical analysis results were recorded in Table 4.

Discussion

In present century, plant resources are more but these resources are dwelling fast due to the onward march of civilization. Although a significant number of studies have been used to obtain purified herb chemical, very few screening programmes have been initiated on crude plant materials. It has also been widely observed and accepted that the therapeutic value of plants lies in the chemical constituents present in the herbs.

Pharmacognostical studies were done on large variety of medicinal plants and the present study was carried out to establish the identification of *Urena lobata*. Preliminary phytochemical screening

Table 4: Qualitative Chemical Examination of various extracts.

Constituents	Pet.Ether Extract of <i>Urena lobata</i>			Ethanol Extract of <i>Urena lobata</i>			Water Extract of <i>Urena lobata</i>		
	Leaf	Stem	Root	Leaf	Stem	Root	Leaf	Stem	Root
Alkaloids	-	-	-	-	-	-	-	-	-
Carbohydrates	-	-	-	-	-	-	-	-	-
Glycosides	-	-	-	-	-	-	-	-	-
Sterols	-	-	-	+	-	-	-	-	-
Resins	-	-	-	-	-	-	-	-	-
Tannins and Phenolics	+	-	-	+	-	-	-	-	-
Flavonoids	+	+	-	+	-	-	-	-	-

showed the presence of sterols, tannins, flavonoids and flavonoid content was found to be more when compared with tannins and sterols. The presence of flavonoid like compounds in *Urena lobata* can be used as an antioxidant drug. The present work can be concluded that, this traditional herb may represent new source of antioxidant, immunomodulatory as well as antimicrobial with stable biologically active components that can establish a scientific base for the use of plants in modern medicines.

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