

To Study Pharmacognostic Parameter Of Urena Lobata

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1. ABSTRACT

Urena lobata is a plant (Malvaceae family) found abundantly in tropical and sub-tropical regions. Traditionally plant is used in rheumatism, wound and as antiseptic. To evaluate the scientific basis for the use of the plant. Pulverized *Urena lobata* leaves were investigated for physical constant (Moisture content, LOD, ash value, Extractive value). The dried leaves were pulverized and liquid-liquid extraction (Hydro-alcoholic extraction) is carried out. The fresh leaf of *Urena lobata* was studied for microscopical characterization which shows upper and lower epidermis, palisade cells, spongy parenchyma in lamina while collenchyma and vascular bundles were observed in midrib. Although herbal drugs are known to elicit their response quite slowly but they are now overtaking allopathic medicine owing to its high cost, side effects, drug resistance and development of tolerance. This article spots some light on an obscured herbal drug named *Urena lobata* Linn (Malvaceae) for its antimicrobial activity and also provides some pharmacognostic studies of the drug.

KEYWORDS : Soxhlet Extraction, Moisture content, Ash Value, Extractive value, Ash value.

2. INTRODUCTION :

Medicinal plants contain bioactive compounds which over the years have been exploited in traditional medical practice for treatment of various ailments. *Urena lobata* Linn (Bengali name: Bun ochra, *Aramina gacch*; Family: Malvaceae) is a wild flowering shrub as well as weed in paddy fields. In Bangladesh they are mostly found in Chittagong, Naogaon, Jessore and Tangail districts and are native to the Indian continent, South-east China, Taiwan, Southeast Asia and Northern Australia.

The plant possesses antidiabetic, antidiarrheal, antioxidant, antibacterial, hepatoprotective and immunomodulatory activities. Traditionally these two plants are used as abortifacient, oxytocic, anti-implantation, antidiarrheal and antimicrobial agents in the southeast areas of Bangladesh. As part of our continuing investigations on medicinal plants of Bangladesh, we studied the antimotility, analgesic, anti-inflammatory and membrane stabilizing activities of *U. lagopodies* and *U. lobata* in addition to the results of preliminary phytochemical screenings of the above plants growing in Bangladesh. *Urena lobata* Linn (Malvaceae), otherwise called Caesar weed, is a shrub that grows Between 0.6- 3 m tall and up to 7 cm in basal diameter. The plant found abundantly in tropical and Sub-tropical regions of the land. The plant blooms with pink coloured flowers. Various extracts of Leaves and roots are used in herbal medicine to treat such diverse ailments as colic, malaria, Gonorrhoea, fever, wounds, toothache and rheumatism. Antihyperglycemic effect of *Urena lobata* Leaf extract by inhibition of DPP-IV on diabetic rats.

Aerial parts of *Urena lobata* is reported to Contain Mangifera and Quercetin and roots having imperatorin and furanocoumarin. *Urena lobata* is one of the medicinal plants used to treat diabetes in Nigeria. Its hypoglycaemic and antidiabetic Activities have been demonstrated. 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.

Herbal medicines have been a main source of primary healthcare all over the world. According to the World Health Organization, more than 70% of the world's population must use traditional medicine to satisfy their principal health needs. India is the

largest producer of medicinal herbs and is called as botanical garden of the World. Herbal medicine is gaining popularity both in developing and developed countries because of their natural origin³. Current estimates suggest that, in many developing countries, about two-third of the population relies heavily on traditional practitioners and medicinal plants to meet primary health care needs⁴. India has an officially recorded list of 45,000 plant species and a various estimation of 7500 species of medicinal importance⁵. Globally sales of herbal medicines are growing by about 10% annually. Over 25% of our common medicines contain at least some compounds obtained from plants. The use of traditional medicines increased mainly due to the failure of modern medicines to provide effective treatment or chronic diseases and emergence of multidrug resistant bacteria and parasites⁶. Herbal drugs referred as plant materials or herbalism, involves the use of whole plant or parts of plant, to treat injuries or illnesses. The wide acceptance of herbal medicines are due to low/minimum cost, potency and efficiency, enhanced tolerance, more protection, fewer side effects, complete accessibility and recyclable nature^{7,8,9}. Although newer synthetic antimicrobial agents are being developed nowadays, a variety of infective microorganisms have also been identified causing persistent and chronic infections in humans¹⁰. Infections caused by *Escherichia coli*, *Klebsiella spp.*, *Salmonella spp.*, *Pseudomonas spp.* And *Staphylococcus aureus* are the most common ones. The continuous use of antibiotics has led to the development of resistant microorganisms. Also antibiotics are also known to cause hypersensitivity. This problem can be tackled by exploring alternative antimicrobial agents which can overcome the drawbacks of antibiotics. Hence, some local medicinal plants are now being studied for possible antimicrobial activity¹¹.

3. AIM & OBJECTIVE -

AIM – “ To study pharmacognostic parameter of selected medicinal plant ”

OBJECTIVES –

- ✓ Identification, collection and authentication of plant.
- ✓ Processing of plant material.
- ✓ Preliminary pharmacognostic evaluation.
- ✓ Preparation of the extract
- ✓ Physicochemical investigation of plant

4. LITERATURE REVIEW :

1) **PA shelar, et al.**, Pharmacognostic evaluation, Phytochemical screening and Antimicrobial Study of Leaves Extracts of *Urena Lobata* Linn 2017 reported.

Phytochemical screening from materials and methods and physical evaluation and also refer table format result of physical evaluation.

2) **Sayyad sipai babu, et al.**, A pharmacological review of *urena Lobata* Plant 2016 reported. Taxonomical classification and also some part of morphology and distribution.

3) **Muhammad Torequal Islam, et al.**, A revision on *urena Lobata* 2017 reported. Plant Taxonomy and Traditional uses.

4) **P.L. Rajagopal, et al.**, Anti-inflammatory activity of the leaves of *urena Lobata* Linn. 2018 reported. Anti-inflammatory activity of *urena lobata* plant.

5. PLANT PROFILE –

URENA LOBATA



Fig no 1 : Matured & Ripe Fruit



Fig no 2: Aerial Part



Fig no 3 : Flowers of Urena Lobata

Taxonomy of *Urena lobata* L.

Taxonomical classification	Synonyms	Common names
Kingdom: Plantae Subkingdom: Tracheobionta Super division: Spermatophyta Division: Mangoliophyta Class: Mangoliopsida Sub class: Dilleniidae Order: Malvales Family: Malvaceae Genus: Urena Species: Lobata	<i>Urena lobata</i> Linn. <i>Urena americana</i> L. f. <i>Urena grandiflora</i> DC. <i>Urena trilobata</i> Vell. <i>Urena lobata</i> L. <i>Urena diversifolia</i> Schumach	Kingdom: Plantae Subkingdom: Tracheobionta Super division: Spermatophyta Division: Mangoliophyta Class: Mangoliopsida Sub class: Dilleniidae Order: Malvales Family: Malvaceae Genus: Urena Species: Lobata

CHEMICAL CONSTITUENT :

The main constituents of *Urena lobata* Linn, include flavonoids, flavonoids glycosides, β -sitosterol, stigmasterol, furocoumarin, imperatorin, mangiferin and quercetin. Also, it contains kaempferol, luteolin, hypolatin and gossypetin. Roots contain carbohydrate 33%, protein 1.9%, fat 1.8%, fiber 51.7%, moisture 6.6%, and ash 5%. Roots also, contain ephedrine, 4'-O-Me-apigenin and phenolic acids such as vanillic, *p*- coumaric, and melilotic acids. Mannose and xylose are present in mucilage. Raw leaves are reported to contain 81.8% moisture, 54 cal, 3.2 g of 57 protein, 0.1 g fat, 12.8 g carbohydrates, 1.8 g fiber, 2.1 g ash, 558 mg calcium and 67 mg of phosphorous per 100 g. The leaf contains only traces of alkaloids also contains flavonoid like 4'-O-Me-kaempferol and other constituents like kaempferol, rutin, afzelin, astragaloside, tiliroside, kaempferol-3-O- β -D-glycopyranoside-7-O- α -L-rhamnoside, kaempferol-7-O- α -L-rhamnoside, kaempferol-7-O- α -L-rhamnoside-4'-O- β -D-glycopyranoside, and crenuloside. Leaf also contains phenolic acids such as vanillic, syringic, *cis* and *trans p* coumaric and gallic acids. The mucilage contains homopolysaccharide of glucose (glucan). Stem contains vanillic and *cis* and *trans p*- coumaric acids. The sugar monomer present in stem mucilage is reported as xylose 12,14-1

BOTANY :

The plant *Urena lobata* Linn of Malvaceae family is an erect herbaceous or semi-woody, a tomentose shrub growing 60-250 cm or more in height and has a basal diameter of 7cm. *Urena lobata* is annual in subtropic and perennial in the tropics. It grows in moist regions. *Urena* grows best in hot, humid climates, with direct sunlight and rich, well-drained soil. It is found wild in the tropical and temperate zones of North and South America and in Asia, Indonesia, the Philippines, and Africa. Cultivated crops, usually grown as annuals, are found mainly in the Congo Basin and Central Africa, with smaller plantings in Brazil, India, and Madagascar. The young stem and branches are covered with a bit of harsh scattering stellate hair and sessile or shortly stalked pinkish auxiliary flowers. Leaves are simple, alternate, petiolate, stipulate; blade-very variable, usually broader, long round or ovate, up to 10-15 cm long and cordate at the base angled or shallowly 5-7 lobed 12, 15, 16.

PHARMACOLOGICAL ACTION :

The root of *Urena lobata* is a popular diuretic in Assam. A decoction of its stem and root is used in Brazil as a remedy in severe windy colic. A poultice prepared from the roots and leaves is used as an emollient. The flowers are administered as a pectoral and expectorant in dry and inveterate coughs. An infusion of the flowers is used as a gargle for aphthae and sore throat. The root is used in Assam as an abortifacient 12. Traditionally the plant is being used in the treatment of febrifuge and rheumatism. It is useful for wounds, toothache, gonorrhoea and as food for animals as well as humans 14,16,17. It was also reported that, the plant parts exhibit antioxidant activity 18,19, cytotoxic activity 19, radical scavenging potential 20, antimicrobial 21, anti-motility, analgesic, anti-inflammatory, membrane sensitizing activity 22, immunomodulatory 23,24, hypoglycemic effect 25, anti-diarrheal 26, hypolipidemic 27 and anti-fertility/spermatogenesis effect 28.

MORPHOLOGY AND DISTRIBUTION :

It is a subshrub 0.6-3 m in height and up to 7 cm in basal diameter. *Urena lobata* is an annual in subtropic and perennial in the tropics. A variable under shrub about 0.6-3 m in height and up to 7 cm in basal diameter. It grows in moist regions [4]. *Urena* grows best in hot, humid climates, with direct sunlight and rich, well-drained

soil. It is found wild in the tropical and temperate zones of North and South America and in Asia, Indonesia, the Philippines, and Africa. Cultivated crops, usually grown as annuals, are found mainly in the Congo Basin and Central Africa, with smaller plantings in Brazil, India, and Madagascar.

BENEFITS AND DETRIMENTS :

Various extracts of leaves and roots are used in herbal medicine to treat such diverse ailments as colic, malaria, gonorrhoea, fever, wounds, toothache, and rheumatism. A semi-purified glycoside obtained from Caesar weed leaves was 86% as effective an anti-inflammatory as aspirin in rats.

However, the plant is little browsed by cattle and can become a severe weed in pastures and plantations. Burs that collect on clothing and in animal fur are a nuisance. The plant was used traditionally as an antibacterial, anti-inflammatory, amoebicidal also in bronchitis, diuretic, gastritis, cough, nephouritis, diarrhoea, fever, pneumonia, gingivitis, emollient, menorrhagia, and emmenagogue. It is also used for gonorrhoea, wounds toothache and also used for food for animals as well as humans previous research by other workers on the aerial part of the plant yield mangeferin and quercetin. Triglycerides were isolated from the plant 3 and imperatorin, and a furocoumarin was isolated from roots of *Urena lobata*.

MATERIALS AND METHODS :

1) Selection of Plant Material :

In the present study, I have selected the plant *urena lobata* Linn leaves.

2) Collection of Plant material :

The plant material *Urena lobata* Linn (Malvaceae) were collected from the 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.

3) Preparation of Extract :

The pulverized dried *Urena lobata* leaves were extracted with ethanol using Soxhlet apparatus. The powder of *Urena lobata* leaves were also macerated with chloroform water. Ethanol and aqueous extracts were filtered & evaporated to dryness.

4) Physical evaluation :

The ash values, extractive values and loss on drying were performed according to the officinal methods prescribed in Indian Pharmacopeia.

5) Phytochemical screening :

The dried leaves powder was evaluated for phytochemical screening.

TRADITIONAL USES :

1) Antioxidant Activity :

Effects of *U. Lobata* on the oxidative status of normal rabbits: With recognized therapeutic effects, the plant was studied for toxic side-effects. Results showed no evidence of oxidative damage on liver and pancreatic malondialdehyde (MDA) levels on rabbits and even seemed to provide protection against lipid peroxidation.

2) Phytochemical/antioxidant/antimicrobial :

Three compounds isolated from *U. lobata* leaf extract: Kaempferol, quercetin, and tiliroside which showed strong antimicrobial activity against *Escherichia coli*, *Bacillus subtilis*, and *Klebsiella pneumonia*. The study supports the traditional use of the plant for treatment of infectious diseases.

3) Antidiarrheal/seed extract :

A study reports the antidiarrheal potential of seed extracts of *U. lobata* used in the traditional medicine by the Naga tribes of India. Both plants showed significant inhibitory activity against castor oil-induced diarrhoea and prostaglandin E2 (PGE2)-induced intrafluid accumulation. Both showed a significant reduction in gastrointestinal motility with no signs of toxicity. Results help explain it traditional use as an antidiarrheal agent.

4) Antibacterial Activity :

A study of the methanol extract of *U. lobata* showed a broad spectrum of antibacterial Activity Comparative study of a methanolic extract of *U. lobata* root and a standard herbal formulation showed antibacterial activity.

5) Immunomodulatory Activity : A study of the methanolic extract of *U. lobata* showed phagocytosis and intracellular killing potency of human neutrophils. The study concludes that *U. lobata* possesses

immunomodulatory property. Studies have previously yielded mangiferin and quercetin from the aerial parts of the plant. This study isolated imperatorin, a furocoumarin, from the roots.

6) Antidiabetic/hypolipidemic :

Study of aqueous extracts of *U. lobata* (roots and leaves) in STZ-induced diabetic rats showed recognizable hypoglycaemic/antidiabetic and anti-hyperlipidaemic effects.

Hypoglycaemic/long-term effects of root extract Study in rabbits showed *U. lobata* aqueous extract of roots significantly reduced body weight and fasting glucose. It exerted an initial toxic effect on hepatocytes and also caused bile obstruction. However, the effects were not severe and not sustained. A reduction in dose, frequency, and duration of administration may reduce the side effects observed in the study.

7)Antifertility/spermatogenesis effect :

Study evaluated antifertility activity in adult male Wistar albino rats. Results showed *U. lobata* reversibly inhibited spermatogenesis and steroidogenesis indicating reversible antifertility activity.

8)Antioxidant/cytotoxic/leaves :

Study evaluated a methanolic extract of leaves for antioxidant and cytotoxic potentials. The extract showed potent antioxidant activity with effective scavenging of free radicals and potent cytotoxic activity in the brine shrimp lethality assay.

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