

A PHARMACOLOGICAL REVIEW OF *URENA LOBATA* PLANTSAYYAD SIPAI BABU<sup>1</sup>, DASARI BINDU MADHURI<sup>2</sup>, SHAIK LIAKHAT ALI<sup>3</sup>

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Received: 24 November 2015, Revised and Accepted: 30 November 2015

## ABSTRACT

*Urena lobata*, commonly known as Caesarweed or Congo jute belongs to the family Malvaceae. In India, it is widely available in Andhra Pradesh, southern and some parts of northern regions. Its leaves, roots, stem, and bark have some beneficiary activities for medicinal and non-medicinal purposes such as antioxidant, inflammatory, antimicrobial, antidiarrheal, antidiabetic, and antihyperlipidemic, so we believe that this plant has the potential to cure many more disease and disorders than these reported activities, so this *U. lobata* can be a plant to be focused on for research activities.

**Keywords:** Pharmacological activities, Antioxidant, Antimicrobial, Antidiabetic, Hypolipidemic.

## INTRODUCTION

*Urena lobata*, commonly known as Caesarweed [1] or Congo jute [2,3], belongs to the family Malvaceae. Caesarweed is also known as hibiscus bur, aramina, pink Chineseburr, bur mallow, grand cousin, cadillo, carrapicho do mata, malva, mahot cousin, cousin petit, cousinrouge, jut africain, cooze mahot, dadangsi, and mautofu. Common names of Caesarweed are as follows in Hindi: Bachita, Unga, Lapetua; in Manipuri: Sampakpi; in Marathi: Vanbhendi; in Tamil: Ottatti; in Telugu: Nalla Benda, Pedda Benda; in Kannada: Otte.

TAXONOMICAL CLASSIFICATION OF *U. LOBATA* (FIG. 1A AND B)

Kingdom: Plantae  
 Subkingdom: Tracheobionta  
 Super division: Spermatophyta  
 Division: Mangoliophyta  
 Class: Mangoliopsida  
 Sub class: Dilleniidae  
 Order: Malvales  
 Family: Malvaceae  
 Genus: *Urena*  
 Species: *Lobata*

## MORPHOLOGY AND DISTRIBUTION

It is a subshrub 0.6-3 m in height and up to 7 cm in basal diameter. *U. 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

Fig.1: (a and b) *Urena lobata*

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 Caesarweed 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, nephritis, diarrhea, 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 mangleferin and quercetin. Triglycerids were isolated from the plant 3 and imperatorin, and a furocoumarin was isolated from roots of *U. lobata* [4].

## CHEMICAL CONSTITUENTS

Roots contain carbohydrate 33%, protein 1.9%, fat 1.8%, fiber 51.7%, moisture 6.6%, and ash 5%. Preliminary phytochemical analysis of methanol extract of leaves shown presence of alkaloids, flavonoids, saponins, and tannins. Ethyl acetate portion and n-butanol portion of a 95% ethanol extract of branches and leaves found ten flavonoid compounds, viz. kaempferol, rutin, quercetin, afzelin, astragaln, 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. 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, and 2.1 g ash, 558 mg calcium, and 67 mg of phosphorous per 100 g.

## ACTIVITIES REPORTED

## Antioxidant

Effects of *Irvingia grandifolia*, *U. Lobata*, and *Carica papaya* on the oxidative status of normal rabbits: With recognized therapeutic effects, the plants were 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 [5].

#### Phytochemical/antioxidant/antimicrobial

In this study, isolated 3 compounds 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 [6].

#### Antidiarrheal/seed extract

A study reports the antidiarrheal potential of seed extracts of *Lithocarpus dealbata* and *U. lobata* used in the traditional medicine by the Naga tribes of India. Both plants showed significant inhibitory activity against castor oil-induced diarrhea and prostaglandin E2 (PGE2)-induced intrafluid accumulation. Both showed a significant reduction in gastrointestinal motility with no signs of toxicity. Results help explain its traditional use as an antidiarrheal agent [7].

#### Antibacterial

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

#### Immunomodulatory

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 [8].

#### Furocoumarin/imperatorin

Studies have previously yielded mangiferin and quercetin from the aerial parts of the plant. This study isolated imperatorin, a furocoumarin, from the roots [9].

#### Antidiabetic/hypolipidemic

Study of aqueous extracts of *U. lobata* (roots and leaves) in STZ-induced diabetic rats showed recognizable hypoglycemic/antidiabetic and anti-hyperlipidemic effects [10].

#### Hypoglycemic/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 [11].

#### Antioxidant/roots

Study evaluated the methanolic extract of roots of *Sida retusa*, *Triumfetta rhomboidea*, and *U. lobata* for antioxidant activity. The extracts were found to inhibit lipid peroxidation scavenge hydroxyl and superoxide radicals *in vitro*. Results showed all three possessed significant antioxidant activity [12].

#### Antifertility/spermatogenesis effect

Study evaluated *Enicostemma axillare* leaves and *U. lobata* roots for antifertility activity in adult male Wistar albino rats. Results showed *E. axillare* and *U. lobata* reversibly inhibited spermatogenesis and steroidogenesis indicating reversible antifertility activity [13].

#### 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 [14].

#### Liver effect/toxicity study

Study evaluated the effects of aqueous extract of root on the liver of adult Wistar rats. Results show that biochemical and morphological

organization of the liver can be significantly altered with continued and increased use of the extract [15].

#### Antihyperglycemic/antinociceptive/leaves

Study of methanolic extract of leaves showed antihyperglycemic and antinociceptive effects. Alkaloids, flavonoids, saponins, and tannins present in the methanolic extract may be responsible for the antinociceptive effect [16].

#### Sperm abnormality effects

In a pilot toxicity study, in albino rats, *U. lobata* caused a significant increase ( $p < 0.05$ ) in headless tail sperm cell abnormality, a primary sperm abnormality caused by a disruption in the course of spermatogenesis [17].

#### Wound healing

Study evaluated a methanolic extract for wound healing activity in albino rats. Results showed significantly wound healing activity in excision, incision, burn, and dead space wound models, comparable to the Povidone-Iodine formulation [18].

#### Antidiarrheal/leaves

Study evaluated the antidiarrheal effects of *L. dealbata* seed extract and *U. lobata* leaf extract in castor oil-induced diarrhea and PGE2-induced intrafluid accumulation in murine models. Both extracts showed a significant reduction in gastrointestinal motility in the charcoal meal test. Acute toxicity tests showed no sign of toxicity in the animals [7].

#### Antiproliferative/antioxidant

Study of methanol extracts of *U. lobata* and *Viscum album* showed significant antiproliferative and antioxidant properties on MB-MDA435 breast cancer cell line [19].

#### Analytical potential of flower dye extract

Study showed the flower extract of *U. lobata* can be used as an acid-base indicator in all types of titration, with potential preference over synthetic indicators because of easy availability, inertness, ease of preparation, and cost-effectiveness [20].

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