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### Review Article

## Blepharis maderaspatensis (L.) Hyene Ex Roth: A Review

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### ABSTRACT

Nature has been a wellspring of therapeutic operators for a huge number of years and an exceptional number of present day drugs have been secluded from common sources. Higher plants, as wellsprings of restorative mixes, have kept on assuming a prevailing part in the support of human wellbeing since old circumstances. More than half of all cutting edge clinical medications are of characteristic item starting point and assume a critical part in tranquilize advancement programs in the pharmaceutical business. Blepharis is an Afro-asiatic class including 129 species, having a place with the family Acanthaceae, broadly circulated in bone-dry and semi-dry natural surroundings. A portion of the animal varieties incorporate *B. attenuata* Napper, *Blepharis edulis*, *B. sindica*, and *B. maderaspatensis*. *Blepharis maderaspatensis* (L.) Heyne ex Roth is utilized for treatment of various illnesses like dysuria, cerebral pain, and maladies of sensory system, diuretic and love potion. These plants show an extensive variety of pharmacological exercises including cell reinforcement, mitigating, hostile to joint, antimicrobial, antifungal, against ulcer and cytotoxic exercises. Some settled pharmacological exercises of these plants have been talked about in this article. Wide varieties of the plants and their dynamic standards have been assessed for pharmacological properties. The plant species being generally conveyed can be utilized as another option to the customary medications. Subsequently, there is a need to know the plausibility of utilizing removes and bioactive mixes got from such plants for the control of perpetual infections as asserted by customary healers.

**Keywords:** *Blepharis maderaspatensis* (L.) Heyne ex Roth, Antimicrobial activity, Anticancer, Antioxidant, larvicidal, Anti-inflammatory activity

## Introduction

Restorative plants are imperative for pharmacological research and medication advancement, not just when plant constituents are utilized specifically as remedial specialists, yet additionally as beginning materials for the blend of medications or as models for pharmacologically dynamic mixes. India has a rich social legacy of customary prescriptions which incorporates Ayurveda and Siddha arrangement of drugs. Plants are the essential wellspring of meds in these frameworks. A noteworthy number of present day pharmaceutical medications are in this manner in view of or got from restorative plants. Researchers of present day period regularly request logical approval of home grown cures. Higher plants, as wellsprings of therapeutic mixes, have kept on assuming an overwhelming part in the support of human wellbeing since old circumstances. More than half of all advanced clinical medications are of common item source and assume an imperative part in tranquilize improvement programs in the pharmaceutical business.



<b>Kingdom</b>	<b>Plantae</b>
<b>Subkingdom-</b>	Viridiaeplantae
<b>Phylum-</b>	Tracheophyta
<b>Subphylum-</b>	Euphyllophytina
<b>Infraphylum-</b>	Radiatopses
<b>Class-</b>	Magnoliopsida
<b>Subclass-</b>	Lamiidae
<b>Super order-</b>	Lamianae
<b>Order-</b>	Scrophulariales
<b>Family-</b>	Acanthaceae
<b>Genus-</b>	<i>Blepharis</i>
<b>Species -</b>	<i>Maderaspatensis</i>

#### Taxonomic Details

#### Distribution

Blepharis is an Afro-asiatic variety involving 129 species, having a place with the family Acanthaceae, generally disseminated in dry and semi-bone-dry territories. Widespread in tropical Africa and through Arabia to India and Thailand Range: Uganda. Range: Kenya. Range: Tanzania. A portion of the plant groups incorporate *B. attenuata*, *Blepharis edulis*, *B. sindica*, and *B. maderaspatensis*. These plants display an extensive variety of pharmacological exercises including cancer prevention agent, calming, hostile to joint, antimicrobial, antifungal, against ulcer and cytotoxic exercises. As of late, conventional prescriptions have been supplanted, all things considered, by concoction and engineered pharmaceuticals, natural solutions are by and by making strides as they are less expensive and more secure when contrasted with the manufactured medications and might be utilized without or least symptoms.

## External Morphology

It is ordinarily known as crawling *Blepharis*. Usually on the base grounds, even in poor gravelly soils, among rocks and a plain from the drift to 1400m. It is to a great extent appropriated in tropical Africa and India. It is a wiry crawling under a bush up to 50cm high. They are prostrate herbs. Leaves are exchange, unequal, 3-5 x 2cm, block, zenith, apiculate, puberulus, edges indirectly serrate, petiole. Leaf arrangement is whorled, leaf write is basic, and leaf shape is elliptic-praise to oblanceolate. Bloom in helper group, bracts 4 sets, bracteoles 1.5cm, spatulate, obovate, edges dentate with hardened extended hairs, external calyx projections 1.3cm and 1.8cm, 2 and 3 veined, inward 8mm, corolla tube urceolate, 5mm, bring down lip lessened, upper lip 3 hurred, 18 x 12 mm, white with pink nerves, fibers 4 x 5 mm, anthers 1-celled, apiculate, hairy, ovary 2.5mm elongated, style 1cm with a basal ring. Blooms show up amid November – February. Natural products are ellipsoid container, compacted, shinning, seeds 1-2, orbicular, smoothed and it organic products in the long stretch of December.

## Vernacular Names

Uttagana (hindi), Creeping Blepharis, Kodali Soppu (kannada), Elumbotti (Malayalam), Kooravaal Chedi (Tamil)

## Chemical Composition

The major constituents were diethyl phthalate(59.81%), n- hexadeconic acid, avlo topic acid (7.68%), butyl phosphoric acid , ethyl 4-methoxy-2- methyl butyl ester , cyclopentyl methyl phenyl phosphine oxide, 2-methyl -7H, 1,3,4-thiadiazolo (3,2-a) pyrimidin-7-one (19.79%), 1 H -4- azocyclo prop indene, octahydro -4- methyl- thiazolo (3,2-a) pyridinum, 3- carboxy-2,3-dihydro-8- hydroxy hydroxide, phosphoramidic acid, N,N- di methyl mono ethyl ester (12.73%).

## Medicinal Uses

*Blepharis maderaspatensis* seeds are of monetarily vital and great hotspot for ulcer. They are considered as weaken, resolvent, diuretic, and expectorant and deobstruent. They are dried and the steroid gomisin D is utilized to treat Parkinson's infection. Leaves are expectorant and used to regard the scatters, for example, bone crack, bubbles, loose bowels and lactation. Glue of leaves is blended with lime squeeze and connected to cuts. Leaf juice is utilized as a part of throat inconveniences and asthma. Stem an astringent for the guts, love potion utilized as a part of Leucoderma, mental de courses of action and is connected to wounds and ulcers. This scrambling perpetual herb is utilized generally for treatment of snake nibbles, wounds, edema and gout. It is additionally utilized for treatment of various sicknesses like dysuria, migraine, and infections of the sensory system, diuretic and sexual enhancer.

It is Afro – Asiatic variety including 129 species which happen in parched and semiarid territories. Past phytochemical contemplates on *Blepharis maderaspatensis* (L.) Heyne ex Roth included portrayal of different optional metabolites, for example, alkaloids, flavonoids, phenols, tannins, saponins, terpenoids, glycosides and steroids. Some settled pharmacological exercises of these plants have been talked about in this article. The plant species being broadly dispersed can be utilized as another option to the regular pharmaceuticals. Consequently, there is a need to know the achievability of utilizing separates and bioactive mixes got from such plants for the control of interminable sicknesses as guaranteed by conventional healers.

Table 1: Phytochemical analysis of *Blepharis maderaspatensis* (L.) Heyne ex Roth. Leaf extract.

Phytochemicals	Aqueous	Chloroform	Ethanol	Mechanism of Action
Alkaloids	+	-	-	Intercalates into cell wall and DNA of parasites
Glycosides	+	-	-	Inhibits release of autocoids and prostaglandins
Reducing sugars	+	-	+	Blocks viral fusion
Flavonoids	+	-	-	Complex with cell wall, binds to adhesion
Terpenoids	+	+	+	Membrane disruption
Phenols	+	-	+	Astringent action
Starch	-	-	-	Forms disulphide bridges
Proteins	-	-	-	Blocks viral fusion or adsorption
Amino acids	+	+	+	Causes a decrease in G.I metabolism
Tannins	-	-	-	Binds to adhesions, enzyme inhibition, substrate deprivation, complex with cell wall.
Phlobatannins	+	-	-	Increase supply of digestible proteins
Anthroquinines	+	-	-	Inactivates enzymes, binds to adhesions
Quinines	+	-	-	Complex with cell wall, metal ion complication
Coumarins	-	-	-	Interaction with eukaryotic DNA
Saponins	-	-	-	Possesses membrane permeablizing properties
Sterols	-	+	+	Enhance intestinal absorption of Na and water.

## Pharmacological Activities

### Anti-hyperlipidemic and anti- atherogenic activity

Ethanollic extract of *Blepharis maderaspatensis* (L.) Heyne ex Roth shows significant anti-hyperlipidemic activity and anti-atherogenic activity in triton WR-1339 and high cholesterol diet induced hyperlipidemic in rats. It results mostly from an increased level of LDL in liver. Pre treatment of ethanollic extracts of blepharis maderaspatensis rapidly reduced the triglycerides, LDL, serum total cholesterol, VLDL as comparable with simvastatin.

### **Antioxidant activity**

The ethanollic extract of leaves of *Blepharis maderaspatensis* (L.) Heyne ex Roth shows antioxidant activity. The antioxidant extract was tested by using enzymatic and non-enzymatic assay. The enzymatic antioxidant assays are superoxide dismutase catalase, glutathione peroxidase, glutathione  $\gamma$ -transferase which reveals the presence of free radicals responsible for the antioxidant activity. Vitamin C and vitamin E is highly present in the leaf extract of blepharis maderaspatensis which acts as a free radical scavenger which scavenges peroxy radicals. The leaves extract acts as a good source of effective natural antioxidant and also prevent human disease related to oxidative damage.

### **Wound healing activity**

Significant wound healing activity was observed in animals treated with ethanollic extracts of leaf juice of *Blepharis maderaspatensis* (L.) Heyne ex Roth. The juice of the leaf is applied on wounds to heal it. This showed a gradual reduction in wound area and period of epithelialisation of wound respectively than the control.

### **Larvicidal activity**

Healthy leaves of *Blepharis maderaspatensis* (L.) Heyne ex Roth in ethyl acetate showed significant larvicidal activity against *Aedes aegypti*. The result shows good to moderate effect on fourth instar larvae of *Aedes aegypti* after 24hr of exposure at 400ppm (0.04%) concentration out of four parts 90% results showed *Blepharis maderaspatensis* (L.) Heyne ex Roth contains potential larvicidal bioactive principles.

### **Anti-inflammatory and anti-nociceptive activity**

The ethanolic extract of the *Blepharis maderaspatensis* (L.) Heyne ex Roth provides significant anti-inflammatory and anti-nociceptive activity. The anti-inflammatory effects were evaluated by using carragenan induced paw edema in rats and xylene induced edema in mice. Mouse writhing and tail clips tests respectively. The results revealed carragenan induced test caused a significant inhibition (84.5%, 90min) of paw edema at a dose of 75mg/kg while xylene induced showed significant inhibition (62.05%) at 50mg/kg, histamine induced test showed significant inhibition (90.9% in 90min) where serotonin induced test showed moderate inhibition (54.10% in 180 min). The extract produced significant inhibition of 66.21% and 15.81% at 75 mg/kg in the mouse writhing and tail clip tests.

The aqueous extract of the leaves of *Blepharis maderaspatensis* (L.) Heyne ex Roth was studied for in vitro anti-inflammatory activity by HRBC membrane stabilization method. Among all the extracts showed significant anti-inflammatory activity in a concentration dependent manner. The medical significance of *Blepharis maderaspatensis* (L.) Heyne ex Roth has a good anti-inflammatory activity. As the concentration of sample increases the percentage of inhibition also increases. All the results were compared with standard. The extracts and the extracts containing silver nanoparticles revealed membrane stabilization effect by lyses of erythrocyte membrane. The erythrocyte membrane and its stabilization reveal that the extract may also well stabilize lysosomal membrane. Stabilization of lysosomal membrane activated bactericidal enzymes and proteases to limit the inflammatory response.

### **Anti- Parkinson's activity**

*Blepharis maderaspatensis* (L.) Heyne ex Roth plays a vital role in curing Parkinson's disease. Which is a disorder associated with movement mainly occurs in elderly. It is commonly associated with dementia. Due to this disease neurotransmitter levels are decreased in brain such as dopamine, 5-HT, acetylcholine, nor epinephrine. Dry seeds of *blepharis maderaspatensis* are used for curing this brain disorders. The steroids – gomisin D is the main chemical constituent significantly used to treat this disease.

### **Anti-fracture activity**



Healthy leaves of *Blepharis maderaspatensis* (L.) Heyne ex Roth is made into a paste with white of egg, black gram and onion is applied on the fractured area in human during bone fracture to cure it. Most of the tribal people residing around panchalur and periyur use this medicinal plant for various ailments and for primary health care.

### **Anti diuretic activity**

*Blepharis maderaspatensis* (L.) Heyne ex Roth is a creeping herb native to many parts in central and peninsular India. It has been reported to be used as a diuretic by tribals of Yavatmal district of Maharashtra, India. So in the current work the diuretic activity was evaluated using the lipschitz method. It was decided to test the efficacy of different extracts (petroleum ether extract, ethyl acetate extract and dry alcoholic extract) of *Blepharis maderaspatensis* (L.) Heyne ex Roth for the diuretic activity. The study was carried out at a dose of 200 mg/kg body weight with the different extracts and results obtained showed that only the alcoholic extract showed diuretic activity. Further studies were carried out using the dry alcoholic extract only. Different doses of the extract, i.e., 200,400 and 600 mg/kg body weight were used for the diuretic evaluation study and results showed that the doses of 400 and 600mg/kg body weight yielded results almost at par with loop diuretic (Frusemide). It was seen that the dry alcoholic extract showed promising results with a lipschitz value of 1.4 and 1.44 for the medium as well as high doses. The tests are a conclusive evidence for the ethno botanical study reports. Thus opening avenue for use of this drug as a potent diuretic.

### **Anticancer activity**

The examination of the cytotoxic consequence of the bio-synthesized silver nanoparticles of *Blepharis maderaspatensis* (L) Hyne ex. Roth leaf extracts on human epidermoid cancer cell lines by means of MTT assay. Silver nanoparticles from shade dried leaf extract of *Blepharis maderaspatensis* (L) Hyne ex. Roth and then characterized by various techniques. The eminence of the particle was examined by XRD and morphology by SEM. The silver nanoparticles (SNP) synthesis was resolute by UV-Vis spectroscopy then followed by FTIR and ZETA potential. Bio-synthesized silver nanoparticles were predominantly sphere-shaped in shape and size ranging >100nm Cytotoxicity activity of biosynthesized silver nanoparticles against in vitro human

epidermoid carcinoma A431 cell lines showed a dose –dependent activity with GI50 value of 64.4 and 9.2µg/ml. This extract inhibition is potent and significant. The cell viability was assessed by MTT assay. For huge scale construction of silver nanoparticles this lucrative and eco-friendly severance method can potentially be worn. Thus, the results indicate that silver nanoparticles synthesized biologically from *Blepharis maderaspatensis* (L) Heyne ex Roth leaf extract show marvelous cytotoxic effect with apoptotic features and current result suggest that silver nanoparticles could supply to the upliftment of a certain anticancer drug, that may paved way to the improvement of a novel nanomedicine for the healing of cancers.

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