A Phyto-pharmacological review of *Blepharis maderaspatensis* (L.) B. Heyne ex Roth

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**ABSTRACT**

The present highlight the comprehensive ethno-medicinal uses of *B. maderaspatensis*, to enlighten its phytochemical constituents and pharmacological uses which may useful in various types of diseases. *Blepharis* is a genus of plant in family Acanthaceae and it contains around 126 species found in seasonally dry to arid habitats. One of its plants, *Blepharis maderaspatensis* (L.) B. Heyne ex Roth has been recognized by the *Utingan*, *Otingan*, *Utagan*, and *Chatushpatri* in Hindi, Gujarati, Marathi, and Sanskrit respectively. Leaf extract of *B. maderaspatensis* rich in phytoconstituents like saponins, mucilage, flavonoids like caffeic acid, rutin, quercetin and ferulic acid. It is useful in various types of diseases as proved by pharmacological studies as an anti-hyperlipidaemic, anti-atherogenic activities, anti-inflammatory, antinociceptive activity, anti-ulcer activity, wound healing activity and in diabetic wound. The review suggests the similar uses and nomenclature of *B. maderaspatensis* to *Blepharis edulis* as mentioned in Wealth of India. *Blepharis maderaspatensis* (L.) B. Heyne ex Roth has rich phytoconstituents and varied pharmacological activities. Further, it has similar uses as *Blepharis edulis* mentioned in Wealth of India. *Blepharis maderaspatensis* (L.) B. Heyne ex Roth is the species of original *Utingan* stated in *Ayurveda*. Likewise, it has similar properties and action to the *Blepharis edulis* (Forsk.) Pers. which could be useful for different types of diseases like inflammation, ulcer, wound, diabetic wound. Present review highlights the phytoconstituents and different ethnomedicinal claims and some proven pharmacological activities.

**Keywords:** Acanthaceae, *Blepharis maderaspatensis*, *Blepharis edulis*, *Utingan*.

**INTRODUCTION**

India has been conventional towards traditional medicine and ethnopharmacology for practice. Remarkably, the formulations of Indian traditional medicine have been mixtures of multi-component and their therapeutic uses have been based upon practical skills rather than a mechanism of active ingredients of a mixture [1]. The traditional system like *Ayurveda* and the innovative approach of predictive, protection, and personalized medicine (PPM) have a resemblance between their relationship [2]. European Union rightly considered PPM because of the core of its strategy [3].

More than 1500 herbals are sold as nutritional supplements and/or traditional medicines [4]. *Blepharis* is a genus of plant in the family Acanthaceae and contains around 126 species found in seasonally dry to arid habitats. In *Blepharis* genus *Blepharis persica* is well-known plant which is recognized as a *utingan* in *Ayurveda* and the wealth of India. The leaves are reportedly useful in wounds, asthma, throat inflammation, disorders of liver and spleen, and as a beneficiary in *mutrakruccha* and dysmenorrhea. Seeds of *Utingan* have been useful in *Mutrakruccha* (dysuria), *Svasa*, *Kasa*; in *Vajikaran*, and useful in strangury and eye disorder. The present review is about one of the lesser well-known plant of *Blepharis* genus; *Blepharis maderaspatensis* (L.) B. Heyne ex Roth which is known for its similar uses as *Blepharis persica* like the juice of leaves have been administered for throat troubles and asthma; egg albumin triturated with leaves of *Utingan* along with onion applied externally for bone fractures; the whole plant has been beneficiary in urinary problems [3]. It is known as *Utingan* and/or *Utingan* in Gujarati [6] which is a similar name to *B. persica*. *Blepharis maderaspatensis* (L.) B. Heyne ex Roth is also recognized by the *Utingan* from Gujaraj, *Utingan* in Hindi, *Utagan* in Marathi and *Chatushpatri* in Sanskrit [6] and *Kodali sappu* in Kannada language [7]. The synonyms are *Blepharis boerhaavifolia* [8], *B. maderaspatensis* (L.) Roth, *Acanthus maderaspatensis* L., [7], So, *B. maderaspatensis* is one of the less known folkore plants in therapeutics. However, it’s a useful plant according to its tribal claims and from various books, and many of their actions are proved pharmacologically based on chemical constituents present in it. And, it was found that the detailed scientific review is yet not available. So, the present review article represents the ethnomedicinal uses, phytochemical and pharmacological properties of *B. maderaspatensis*.
MATERIALS & METHODS

Different available kinds of literatures like Vanaspati shastra, Flora of Davanagere district, Flora of Saurashtra, the flora of Orissa, Medicinal plants of India. Vol. I – Karnataka and also digital search as well as all the articles found regarding B. maderaspatensis were searched up to September – 2020. The search criteria include ethnobotanical uses, ethnopharmacological uses, and phytoconstituents of B. maderaspatensis and research work carried out on B. maderaspatensis about its phytochemical and pharmacological properties.

REVIEW RESULTS

Botanical description [8]

Table 1: Taxonomical classification of Blepharis maderaspatensis (L.) B. Heyne ex Roth

<table>
<thead>
<tr>
<th>Scientific classification</th>
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<tbody>
<tr>
<td>Domain:</td>
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<td>Kingdom:</td>
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<tr>
<td>Family:</td>
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<tr>
<td>Acanthaceae</td>
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<tr>
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<td>Acanthoideae</td>
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<tr>
<td>Acantheae</td>
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<tr>
<td>Genus:</td>
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<tr>
<td>Blepharis juss.</td>
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<td>Species:</td>
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<td>Maderaspatensis (L.) B. Heyne ex Roth</td>
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</table>

Taxonomical classification of the Utingan has been shown in table no. 1. A diffuse prostate herb, 30-90 cm tall; stems branched, smooth, internodes in the root. Leaf 4 in a whorl, unequal, 2.5-8 X 1-3.5 cm somewhat pointed, smooth, elliptic, acute: petioles lesser in size. Flowers single, or together, about 1 cm long, bracteoles cuneiform below, broadly spatulate and rounded above, 6-8 mm long. Calyx with outer lobe 2 mm long, pubescent, upper lip narrow; lower lip 3- angled, broad, pale blue with a yellow spot and red or sky-blue lines. Capsules ovoid, compressed, 2 – seeded. Seeds echinate with obtuse spines.

DISTRIBUTION

The plant is recorded from Ghumli; Shriwan, outskirts of Gir; Veraval to Sasan [9]; Deccan Peninsula; Sri Lanka; Myanmar; tropical Africa [10]; Bangalore, Belgum, Bellary, Bijapur, Chikmagalur, Chitradurga, Coorg, Dharwar, Hassan, Kolar, Mysore, Raichur [11].

Ethnomedicinal claims

Blepharis maderaspatensis L. Roth (Acanthaceae) which is known as Pappadak-kodi, in southern India is employed to cure diseases like boils, fracture of bones, diarrhoea, and lactation also [12]. Seeds of Utingan are applied for open cuts and wounds [13], and Swarasa obtained by pounding leaves are heated with ginger oil and externally smeared on an area to heal the excision wound [14]. Dry seeds of this plant which is known as Nethirs poondu within the local language have been containing steroids and Utingan have been used for disorders of the Central Nervous System (CNS) [15].

This plant also includes the usage of Kshara in dropsy, inflammations, oedema, gout. Dehydrated alcoholic extracts of Utingan have been served effective in diuretic; it is also used in venereal disorders by crushing all the plant parts together. The juice of leaves is also administered for throat troubles and asthma; Kalka of Utingan Patra triturated with the ovum of hens and with Allium cepa for bone fractures via an external application and has been known as Dudiya choti in the local language [34]. The panchaga of a plant is used to treat urine problems [35]. Seeds of B. maderaspatensis are said as a tonic and known as Utingan in the local language in Gujarat and they are soaked water for administered in a disease like ulcers, micturition [36]. Further seeds are used as a tonic, in headaches, ulcers, and urinary problems [16]. Seeds are employed in dysuria, diseases of the nervous system and it is also used as a diuretic and as an aphrodisiac [11]. Leaves and seeds are used to treat headaches, nervous disorders [7].

Chemical constituents

The alcoholic extract of Utingan revealed the presence of XVII different compounds during GC-MS analysis. Phytoconstituents had been obtained in the mass spectra were authenticated with the library of NIST. Chemical constituents which have been presented in the plant are 9- Eicosyne, Squalene, Phytol, 3,4-Dihydro-3,5,8-trimethyl-3-(4,8,12trimethyltridecyl)-(2H)-benzopyran-6-acetate, trimethyl-2- hexadecen-1-ol and Cholestan-3-ol, 2 methylene,(3a,5a). The leaf extract of showed Caffeic acid, Rutin, Quercetin, and Ferulic acid [17].

Pharmacological properties

Anti-hyperlipidaemic and Anti-atherogenic activities: The anti-hyperlipidaemic and anti-atherogenic activities of B. maderaspatensis were evaluated using Triton WR-1339 induced hyperlipidaemic rats in experimental models. Pre-treatment of ethanol extracts of B. maderaspatensis (100 mg/kg, po) decreased the lipid levels in albino rats [18].

Anti-inflammatory and Anti-nociceptive activity: Extract of B. maderaspatensis (50 and 75 mg/kg) in carrageenan-induced and xylene-induced tests caused a major inhibition of paw oedema. In a histamine-induced produced substantial inhibition and serotonin-induced test show modest inhibition 90.9 % and 54.10% of paw oedema correspondingly. The extract had been up to a considerable inhibition in the mouse writhing and tail clip tests [19]. In another study, different extracts of the B. maderaspatensis and B. molluginifolia have been evaluated for in vitro anti-inflammatory activity using membrane equilibrium procedure. Ethyl acetate extract of Utingan exhibited superior membrane stability in comparison to ethanolic extract of Utingan [20].

Antioxidant activity: comparatively studied between B. repens and B. maderaspatensis had been undertaken for in vitro antioxidant protocols such as DPPH, free radical ion during current protocol in three different extracts such as petroleum ether, ethyl acetate, and ethanol. Rutin had been taken as a reference standard for the present
CONCLUSION

The present review shows the ethnomedicinal importance of the Blephephas maderaspatensis (L.) B. Heyne ex Roth. Various parts of the Utingan have been utilized in different ailments like inflammation, ulcer, wound, diabetic wound. And, pharmacologically it is found that it can be used as an anti-ulcer, anti-microbial, anti-inflammatory, anti-hypercholesteromic, anti-proliferative, and in wound healing activity due to the presence of the phytoconstituents. However, a clinical study should be necessary to verify and to evaluate its tribal claim in humans.

Role of funding source

There is not any type of funding have been taken from either any type of institute and any type of organization.

Conflicts of interest

There are no conflicts of interest.

REFERENCES


