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Review Article

PHYTOMEDICINAL IMPORTANCE OF *MIMUSOPS ELENGI:* AN EMERGING PRESENT AND PROMISING FUTURE

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ABSTRACT

The practices of traditional medicine are based on hundreds of years of belief and observations and analysis, which help in the development of modern medicine. Today, there is widespread interest in herbal drugs. Maulsari has been used in traditional medicine to provide alternative therapy for the treatment of many disorders. The present review is an attempt to highlight the various ethano botanical and traditional uses as well as phytochemical and pharmacological reports on *M. elengi.*

Keywords: *M. elengi*, plant parts, uses, antimicrobial, anthelmintic.

INTRODUCTION

The practice of traditional medicine is based on hundreds of years of belief and observations and analysis, which help in the development of modern medicine. Today there is widespread interest in herbal drugs. This interest is primarily based upon the belief that herbal medicines are safe, inexpensive and has less adverse effects. One such important medicinal plant is *Mimusops elengi* Linn. commonly known as "Indian meddler tree "or "Bakul tree" (Bhattarcharjee, 2004).

Mimusops elengi is considered as a sacred plant among Hindus and has obtained important place in religious text as well as in ancient Sanskrit literature. Its flowers are celebrated in the Puranas and even placed amongst the flowers of the Hindu paradise. Krishna is said to have fascinated the milkmaids of Brindavan on the banks of Yamuna by playing on his flute beneath the *Mimusops elengi* tree. Kalidas has also included in his classical Sanskrit literature, *Mimusops elengi* flowers as symbol of love and beauty (Mitra, 1981). It has made important contribution to the field of science from ancient time as well as to modern research due to its large number of medicinal properties (Nadkarni et al, 1996.).

CLASSIFICATION

Kingdom – Plantae

Order- Ericales

Family- Sapotaceae

Genus- *Mimuspos*

Species- *elengi* L (Manjeshwar et al, 2011).

ECOLOGY

Mimusops elengi is considered as one of the best trees and it is very famous for its shade, fragrant flowers and its elegant look. In Ayurveda, *M. elengi* is known for its strengthening property for teeth (Bharat et al, 2010). Chewing of the root bark strengthens the teeth and improves oral health. Gargling is useful to treat stomatitis and toothache. Powdered bark along with jiggery is used to treat leucorrhoea and it is also useful in infertility of women. Tender stems are used as tooth brushes. Decoction of bark is used to wash the wounds (Bharat, 2007)

Leaf of *Mimusops elengi* is also used to treat hemorrhage, leucorrhea and excessive sweating. The leaves are used in the treatment of fever, postural eruptions of skin, ulcer, headache, dental diseases, bacterial diseases and snakebite (Padhi and Mahapatra, 2013 and Ali et al, 2008). Half teaspoonful of expressed juice of fresh leaves is poured in nostrils in stupor and coma (Sehgal, et al 2011). Boiled leaves are applied to the head as a cold compress for headache and juice of the leaves squeezed into the eyes for sore eyes (Kar et al, 2012). The flowers are sweet, acrid, oleaginous, cooling, and astringent to the bowels. The powdered flower induce a copious defluxion from the nose, shoulders and other parts of body. The powdered flower is a brain toxic and is useful as a snuff to treat cephalalgia (Prajapati et al, 2009). Water distilled from the flowers is in use amongst natives of southern India, both as a stimulant medicine and as a perfume. Grinding of flowers along with suhaga and rose can be used in ringworm infection (Ghani et al, 2002). To stop running nose, its dried flower can be used in hukka in place of tobacco (Hakeem et al, 2002). The smoke of the flower is used for treatment of asthma (Padhi M, 2013). It reduces excessive sweating because of its anti-perspiratory.

Fruit is used in diarrhea and chronic dysentery because of its astringent property (Kabeeruddin and Makhzanul, 2007). Ripe fruits have anti-putrefactive action and helpful in toxaemia and acts as cardiac tonic. Fruits are also used to prepare murabba. Unripe fruit is used as a masticatory, recommended to be chewed for fixing loose teeth. (Prajapati et al 2009). Fruit is sometimes used for causing miscarriage or abortion.

Seeds are very helpful for us. From the seeds a fixed oil is obtained, which is used for culinary purpose, for burning (Nandkarni, 1996). Seeds are used to fixed loose teeth (Padhi and Mahapatra 2013). Seeds are also used for curing piles. In fact, seed oil is used in cooking and as a luminent (Gopalkrishnan and Shimpi, 2011). Roots decoction is also helpful in body ache. Bark of root is useful in backache (Ghani et al, 2002), leucorrhoea, premature ejaculation, and also makes the semen viscid.

DISTRIBUTION

Mimusops elengi tree is the native of western peninsula. The tree is found in south India in dry evergreen forests. It is distributed in Andaman, martaban, tenasserian, Burma and the western ghats; in the eastern ghats it is found in dry areas, often on laterite and in comparatively small in size. It is mostly found in North western Himalayas, Eastern Ghats, Western Ghats, Central Deccan plateau, East coast, West coast, Indo gangetic plain and Outlying islands (Kirthikar et al, 1999 and Anonymous, 1956).

HABITAT

It is native to peninsular India, found wild throughout south India, Burma and Andaman islands in evergreen forest. This large ornamental tree is also cultivated in gardens for its fragrant flowers (Nadkarni et al, 2009, Prajapati et al, 2009, Bhatacharjee 2004 et al, Dymock et al, 2005, Chopra et al, 2009and Nadkarni & Nadkarni, 2009).

PARTS USED

1. Bark of tree
2. Roots
3. Bark of roots
4. Leaves
5. Flower
6. Fruit

MORPHOLOGICAL CHARACTERS

Habit- Large trees upto 35m tall. It is a medium sized evergreen tree.

Trunk/Bark – Bark dark grey, longitudinally fissured, lenticellate , blaze pink, cylindrical, not deeply furrowed and have red streaks (Govil and Singh, 1992, Gami and Parabia, 2010).

Branchlets – latex white

Exudates – Branchlets terete, puberulous when young, later globurous.

Leaves – Leaves simple, alternate, spiral, petiole 1-2.5 cm long, glabrous, terete and canaliculate towards apex, pubescent when young, later glabrous, lamina 7-14 x 2.5-7 cm, elliptic –oblong, apex shortly acuminate with blunt tip, base rounded or acute. Lateral nerves many,slightly raised beneath, parallel, slender, looped near the margin forming intermarginal nerves, intercostae reticulate.

Flowers- Flowers white, bisexual or unisexual, usually in sessile axillary clusters, rarely solitary, cluster pedunculate or in a raceme like inflorescence, bracteolate. Calyx is a single whorl of usually 4-6 sepals or 2 whorls each with 2-4 sepals. Corolla lobes as many to 2x as many as sepals, usually entire, rarely with 2 lacerate or lobular appendages. Stamens inserted at corolla base or at throat of corolla tube, as many as and opposite corolla lobes to many and in 2 or 3 whorls, staminodes when present alternate with stamens, scaly to petal like. Ovary superior, 4 or 5 locular, placentation axillary, ovules 1 per locule, anatropous. Style1, often apically lobed. Flowering from March- April (Raghunathan and Mitra 2000)

Fruit- An ovoid, flesh berry, yellow when ripe, seed solitary, oblong, shiny.

Seed – 1 to many seeded, seed coat brown (pale yellow in Pouteria anamensis), hard, shiny, rich in tannin, endosperm oily, seed scar lateral and linear to oblong or basal and round (Sharma et al, 2000 and Anonymous, 1995)

CHEMICAL CONSTITUENTS

Mimusops elengi has several medicinal properties like antinociceptive, diuretic effects, gastroprotective, antibacterial, antifungal, anticarciogenic, free radical scavenging, antihyperglycemic etc. So, more focused was given on its chemical composition due to its several medicinal properties. The ethanolic extract of the leaves yielded quercitol (1.7%), hentriacontane, glucose and beta-carotene (Kalita and Saikia, 2004)

Beta-sitosterol, beta-glucoside, D-mannitol and quercetin were recovered from leaves. Bark of *M.elengi* contains tannin, some caoutchouc, wax, coloring matter, starch and ash forming inorganic salts. Saponin was isolated from the ethanolic extract of the bark, which on hydrolysis yielded beta-amyrin and bassic acid. The petroleum ether extracts of stem bark yielded a-spinasterol wheras the aqueous, alcoholic and hexane soluble fractions yielded hederagenin and beta-d-glucoside of beta-sitoserol.

Fresh flowers of *M.elengi* yielded D-mannitol on acetone extraction whereas ethanol extraction yielded beta-sitosterol and beta-sitosterol-beta-D-glucoside. They also yielded quercitol, ursolic acid and a triterpine alcohol which was later, identified as lupeol (Bharat, 2007)

When roots extracted with ethanol, it gave lupeol acetate, taraxerol, a-spinasterol, beta-D-glucoside of beta-sitosterol and hederagenin. Ethanolic extract of *M.elengi* seeds yielded quercitol, dihydrogenquercetin, and quercetin. The fatty oil comprised capric, lauric, myristic, palmitic(16.71%), stearic(17.23%), arachidic, oleic(53.48%) and linoleic(16.71%) acids, the unsaponifiable matter from the seeds fat consists of beta and gamma-sitosterol.

M.elengi reportedly contains calcium (212 mg) and phosphorus (30 mg) per 100 g. The alkaloids are absent in the bark was further shown by phytochemical screening, and are also absent in seeds. Though alkaloids are present in flowers, but pyrrolizidine type of alkaloid is absent in flowers (Arseculerantne et al, 1981)

PHARMACOLOGICAL ACTIVITIES

M.elengi contains variety of active phyto constituents and thus posses various kinds of biological and pharmacological activities. It posses different activities like antibacterial, antihemorroidal, antifungal, anticarcinogenic, free radial scavenging, antihyperglycemic, antineoplastic, gastroprotective, antinociceptive and diuretic effects, antiviral and cytotoxic activities (Prabhat et al, 2010, Satish et al, 2008, Deepak et al, 2005 and Katedeshmukh et al, 2010).

The alcoholic extract of bakul has significant antiulcer activity compare to petroleum ether extracts of bark (Prakash et al, 2011). Satish et al (2008) noted that the aqueous and different solvent extracts viz. petroleum, ether, benzene, chloroform, methanol and ethanol isolated constituents of *M. elengi* leaves was tested in vitro for antifungal activities by poisoned food technique. Aqueous methanol and ethanol extracts recorded highly significant associated antifungal activity against all tested fungi.

The bark extract showed in vitro antimicrobial activity against *Staphylococcus aureus, S. mutans, S.salivarius, S. sangius, Lactobacillus acidophilus* and *Candida albicans* (Prabhat et al, 2010), while aqueous and solvent based extract of aerial parts of bakul were screened for antibacterial activity. The bark was identified as potential antimicrobial possessing part among all tested aerial parts (Bharat et al, 2010).

Petroleum ether, chloroform and alcohol extracts of bark were evaluated for anti-urolithiatic activity in male albino wistar rats. The alcohol extracts of bark significantly lowers the elevated levels of the oxalate, calcium, phosphate in urine and kidney as compared to petroleum ether and chloroform extract (Mitra and Yadav, 1980).

Ethanolic and aqueous extracts of bark of *M. elengi* showed the anthelmintic activity (Hitesh et al, 2011 and Jana et al, 2010). Effects of plant extract on *Eisenia fetida* noted down the paralysis time (vermifuse) and death time (vermicidal). It was found that both ethanolic and aqueous extract of bark have significantly anthelmintic action against *E. fetida*, which may be due to the presence of secondary metabolites of plants such as glycoside, tannins, saponins in the extract (Dhamija et al, 2011 and Jana et al, 2010).

Ghami et al (2012) noted the methanolic extract of *M. elengi* show the hypotensive activities on anaesthetized rats. The methanolic extract of bark of bakul showed wound healing activity in the form of ointment (Gupta and Jain, 2011). Singh et al (2013) reported that *M. elengi* leaf, bark and seeds are potential source of botanical molluscicide against the fresh water snail *Lymnaea acuminate* and *Indoplanorbis exuslus.*

CONCLUSION

In the present comprehensive review, we preferred primary and secondary data to compile the information based on taxanomy, origin, distribution ,description, phtoconstituents and traditional claims on *Mimusops elengi*. As the pharmacologists are looking forward to develop new drugs from natural sources, development of modern drugs from *Mimusops elengi* can be emphasized for the control of various diseases. *M. elengi* plant extracts are very effective against various animal and plant bacteria, fungi and harmful viruses, harmful insects and vectors\pest. Almost all parts of this plant such as leaf, fruit, seed, bark and flowers are used to cure a variety of diseases. This interesting source could be use as a powerful anti-inflammatory and antioxidant agents, along with its significance in food, cosmetics and pharmaceutical industries. The betulinic acids isolated from the bark are proved to be anti-HIV constituent, so that the research work on the bark for anti-HIV effect will be possible. It is quite evident from this review that *Mimusops elengi* L. is an important medicinal herb and extensively all types of medicinal system.

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