

## UNANI DRUG 'MULSARI' (FLOWER PART OF *MIMUSOPS ELENGI* LINN) - PHARMACOGNOSTICAL PROFILE AND A REVIEW OF ITS MEDICINAL USES.

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### ABSTRACT

The flower of *Mimusops elengi* Linn is important Unani single drug used in Unani formulation for various ailments and its Unani name is Mulsari. Pharmacognostical profile of Mulsari was carried out on the basis of color, size and microscopy. Flowers are rich source of calcium oxalate crystals and phyto-constituents. Pharmacological review also carried out in this study. From critical analysis of review of literatures, the pharmacological studies of Mulsari revealed that this single drug have excellent medicinal value and potential due to the presence of phyto-constituents.

**KEYWORDS:** Mulsari; Flower part of *Mimusops elengi* Linn; Unani single drug; pharmacognostical profile; pharmacological review.

### 1. INTRODUCTION

More than seven hundred million people still following medical services from indigenous practitioners who treat their patients according to the principles of three ancient systems of Indian medicine; the Ayurvedic, the Siddha medicine of South India, and the Unani or Graeco-Arabic medicine. The foundations of the Unani system of medicine were laid by Hippocrates (460 B.C.) and later by Galen.<sup>[5]</sup> Mulsari (flower part of *Mimusops elengi* Linn.) is considered as one of the best medicinal plant due to its several therapeutic uses mentioned in Unani medicine against exhilarant, cardiac and brain tonic, antihemorrhagic/styptic, antiseptic/antiputrefactive, cures biliousness, semen retentive, antipyretic, antidiarrhoeal, astringent, stomachic, astringent, semen retentive, anti-haemorrhagic/styptic, antidiarrhoeal, antihemorrhagic/styptic, semen retentive, Inspissant to semen, semen retentive.<sup>[4,12]</sup>

Today many modern research tools for evaluation of the plant drugs are available but pharmacognostic method is one of the simplest and cheapest methods for establishing the correct identity of the source materials.<sup>[11]</sup> The *Mimusops elengi* tree attains large dimensions in the moist evergreen forests of Western Ghats; in the Eastern Ghats.<sup>[2]</sup> It is found in dry areas, often on laterite and is comparatively small in size and belongs to sapotaceae family.<sup>[6,9]</sup> and no pharmacognostic work is reported for Unani drug Mulsari. The main objective of the present study is the

pharmacognostic profiling and pharmacological review of Mulsari.

### 2. MATERIALS AND METHODS

#### 2.1. Plant collection and identification

The dried flowers were collected from market in Chennai, Tamil Nadu, India and the fresh flowers were collected from the garden of Regional Research Institute (Unani), Royapuram, Chennai-600 013, and authenticated at Regional Research Institute (Unani), Royapuram, Chennai - 600 013. Voucher specimen of the plant was deposited for future reference. The collected sample was dried under shade and stored at ambient temperature until use.

#### 2.2. Pharmacognostic study

Compound microscope, glass slides, cover slips, watch glass and other common glassware were the basic apparatus and instruments used for the study. Microphotographs were taken using a microscope attached with camera. Fresh flowers were taken for microscopic studies, transverse sections were prepared and stained as per standard procedure and powder microscopy was performed.

### 3. RESULTS AND DISCUSSION

#### 3.1. Pharmacognostic study

##### 3.1.1 Organoleptic characteristics of Mulsari

The fresh flowers and the dried flowers are used to investigate the different organoleptic features such as condition, thickness, color, odour and taste. Fresh flowers are bisexual, white colored, fragrant flowers, sweet taste, acrid, oleaginous, soft and thick condition. Dried flowers brownish yellow colored, fragrant smell, tasteless, acrid, thick and oleaginous condition.

##### 3.1.2. Macroscopic characters

Dried flowers and flowering buds with pedicel; flower white to yellowish brown, fragrant, nearly 2.5 cm across, pedicel upto 2 cm long; buds ovoid; bisexual, actinomorphic, bracteolate, sepals 4 to 12, imbricate in bud, base connate; corolla gamopetalous into whorls, imbricate in buds, lobes about 8 to 10 in inner whorls and 12 to 16 in outer whorl; stamens epipetalous opposite petals in the inner whorls; anthers 2 celled, style often apically lobed, ovary superior, carpels typically 4 or 5 in a range of 1- 14, placentation axile; ovule one in each carpel, anatropous; characteristic aromatic odour and sweet acrid taste.

##### 3.1.3. Microscopic characters

**Pedicel** – T. S. of pedicel shows circular in outline with ridged surface; epidermis consisting of single layer of polygonal parenchyma cells with multicellular trichomes; cortex consists of parenchyma and some laticiferous cells; the vascular bundles around 8, conjoint, collateral and closed, arranged in a circle, abundant prismatic and rhombohedral calcium oxalate crystals present.

**Petal** – T. S. of petal shows an upper and lower epidermis consisting of closely packed rectangular cells of uniform size: ground tissue consists of irregular, spongy parenchyma cells; vascular bundles of various sizes consisting of xylem and phloem elements, surrounded by bundle sheath; upper surface shows closely packed, slightly wavy walled, thin laterally elongated epidermal cells without intercellular spaces; lower surface shows closely packed, thick and wavy epidermal cells without intercellular spaces.

**Sepal** – T. S. of sepal shows glandular uniseriate; 'T' shaped and multicellular trichomes on upper and lower epidermis; middle portion of the upper epidermis devoid of any type of trichomes, ground tissue parenchymatous; several conjoint, closed vascular bundles surrounded by bundle sheath present; epidermal cells in surface view sinuous on the upper less sinuous on the lower; stomata ranunculaceous, laticifers and crystals present.

**Androecium** - Anther lobes tetrasporangiate, dehiscence extrose; the wall of the anther lobe consists of epidermal

layer of rectangular parenchymatous cells, followed by a layer of epithelial cells and a subsequent layer of endothecium; the pollen grains about 15 to 25 $\mu$  in diameter, single or in groups, spherical, pores 4, the exine smooth and thick.

**Gynoecium** - The ovary is hexa to octa carpellary, syncarpous and superior with a long style and insignificant stigma. It is covered by long 'T' shaped, branched, multicellular, uniseriate multicellular and unicellular glandular trichomes; placentation axile, showing single large bundle in the centre; ovules anatropous.

##### 3.1.4. Powder microscopy

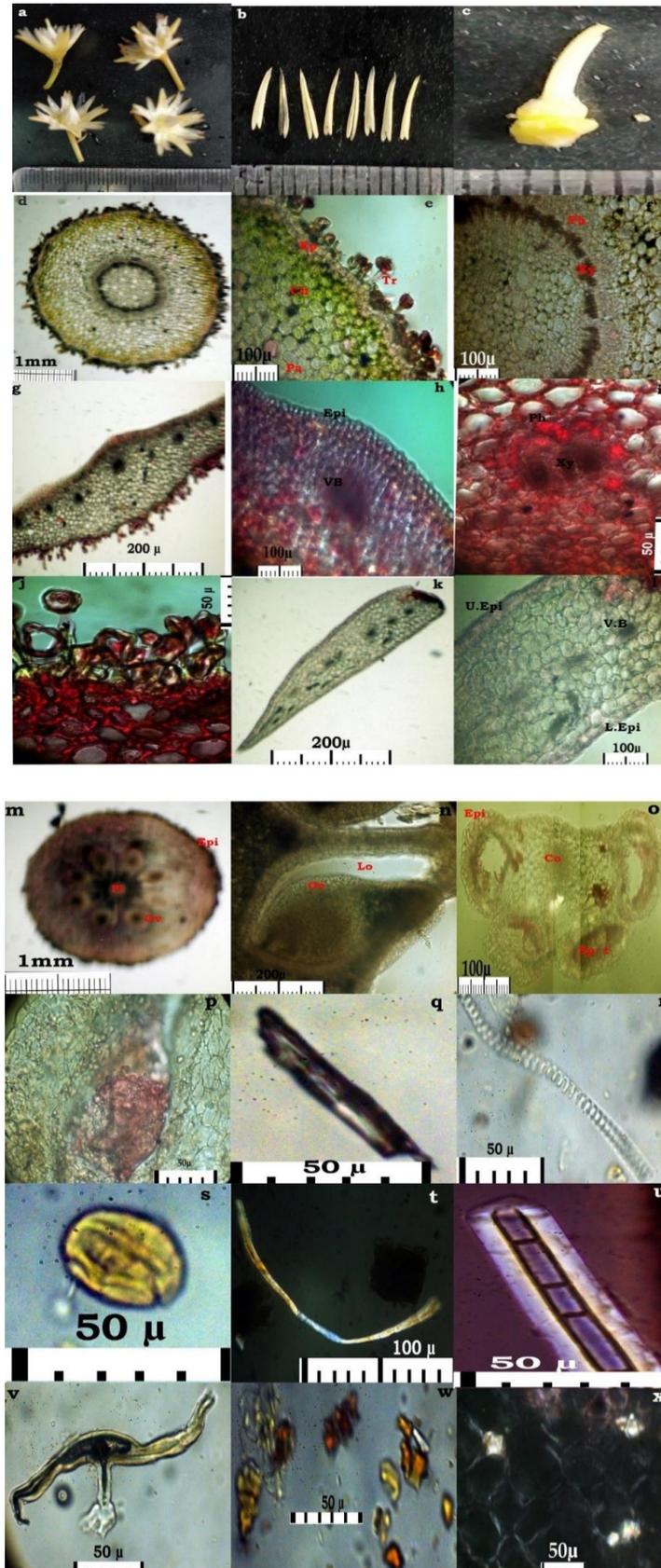
Powder dark brown colored; numerous parenchyma cells containing laticiferous cells; long 'T' shaped, branched, multicellular trichomes; uniseriate multicellular trichomes; unicellular glandular trichomes; scalariform, pitted and reticulate vessels; fibres long thin walled and thick walled with narrow lumen; endothecial layer of anther; pollen grains upto 35 $\mu$ , spherical, exine smooth with four distinct germ pores.

#### 3.2. Chemical constituents

Flowers contain D mannitol,  $\beta$ -sitosterol,  $\beta$ -sitosterol- $\beta$ -D-glucoside, quercetin, quercitol, dihydroquercetin, triterpene alcohol,  $\alpha$ -spinasterol, ursolic acid, lupeol, fatty oils comprising capric, lauric, myristic, palmitic, stearic, arachidic, oleic and linoleic acid<sup>3,10</sup>, gallic acid, kaempferol, sterols, phenolics, flavonoids and alkaloids<sup>13</sup> are present in flowers, but pyrrolizidine type of alkaloid is absent in flowers.<sup>[2]</sup>

#### 3.3. Pharmacological studies

**Cognitive enhancement activity-** Hadaginhil *et al.*, (2010) has worked out the cognitive enhancement activity by alcohol extract of flower. This evaluation done by maza and passive avoidance task method with Menthol as standard by using parameters of step down and transfer latency the ethanol extract of *M. elengi* (100 and 200 mg/kg body weight, p.o.) was administered orally for 8 successive days to both young and aged mice and elevated plus maze and passive avoidance paradigm were employed to assess short term and long term memory respectively. Attenuated amnesic deficits induced by diazepam (1 mg/kg body weight, i.p.), scopolamine (0.4 mg/kg body weight, i.p.) and natural aging. Further, *M. elengi* decreased transfer latencies and increased step down latencies significantly in the aged mice. It also reversed amnesia induced by diazepam and scopolamine in young mice. *M. elengi* also decreased whole brain acetyl cholinesterase activity significantly. Study reported the alcoholic extract showed significant cognitive enhancement effect when compare to control due to the flower extract contain rich content of triterpenoid.<sup>[8]</sup>



a; Flower – Surface View b; Stamens c; Gynoecium d; T.S of pedicel e; Upper view of pedicel f; Inner view of pedicel g; T.S of Sepal h; Upper side view of sepal i; Vascular bundle j; Lower side view of sepal k; T.S of Petal l; Enlarged view of T.S of Petal m; T.S of gynoecium n; Enlarged view of gynoecium o; T.S of Anther p; Enlarged view of pollen sac q; Pitted vessel r; Spiralled vessel s; Pollen grain t; Fibre u; Multicellular trichomev; T-shaped trichome w; Yellowish content x; Calcium oxalate crystals [Ep; Epidermis, Tr;Trichome Ch;

**Chloremchyma cells, Pa; Parenchyma cells, Ph; Phloem, Xy; Xylem, VB; Vascular bundle, U.Epi; Upper epidermis, L.Epi; Lower epidermis, Pl; Placenta, Ov; Ovule, Lo; Locule, Co; Connective, Sp.t; Sporogenous tissue].**

**Antibacterial activity** - Methanol extract from *M. elengi* flower was tested for antibacterial and antifungal, then made into the lotion. The lotion was tested again for its antimicrobial activity, physical and organoleptic properties. Hand lotion of methanol extract of *M. elengi* flower against *S. aureus* bacteria was the best at 16%, but failed to inhibit the growth of *C. albicans* fungi. The presence of terpenoid compounds in the form of a straight-chain and bridge {bicyclo namely: 1.8 cineole (2-Oxabicyclo [2.2.2] octane, 1,3,3- trimethyl); Camphor (Bicyclo [2.2.1] heptane-2-one, 1,7,7-trimethyl); and Borneol L (Bicyclo [2.2.1] heptane-2-ol, 1,7,7-trimethyl)} causes the effect of inhibition of methanol extract of *M. elengi* flower, although the lotion beside having the activity of the extract, also having activity from the media of lotion, is like cetyl alcohol, methylparaben, and triethanolamine and the addition to the presence of patchouli oil as a fragrant binder of methanol extract, it also acts as an antifungal. Therefore, the effect of inhibition is highest than extract<sup>1</sup>.

**Antityrosinase and antioxidant activities** – Narayanaswamy *et al.*, (2011) carried out antityrosinase and antioxidant activities to determine the anti-aging and skin whitening potential with flower extracts. The skin whitening ability of plant extracts was examined through tyrosinase inhibition assay. From the study reports, DPPH scavenging effect and ferric reducing power assay and tyrosinase inhibition assay showed highest inhibition when compared to control. The study proved that the flowers of *M. elengi* have superior skin whitening and antioxidant activities.

**Anti-hyperlipidemic activity-** The hypoglycemic effect of methanol extract of flower of *M. elengi* evaluated in normoglycaemic and alloxan induced diabetic rats. Flower extracts were administrated orally (100mg/kg body weight) to normal and alloxan induced diabetic rats. The fasting blood glucose, oral glucose tolerance test and alloxan- induced diabetic models were performed for the hypoglycemic effect and compared with tolbutamide, a standard drug. From the study report this study resulted the potential hypoglycemic and hypolipidemic effect of flower.<sup>[15]</sup>

**Wound Healing activity-** An ethanolic extract of flower of *M. elengi* evaluated for its wound healing potential in male Albino Wistar rats using an excision wound model. The wound healing potential of the ethanolic extract of flower was studied on the basis of wound contraction data, epithelialization period, the effect on biochemical parameters from the granulation tissue and histopathological observations. The results were compared with the traditional drug Jatyadi Taila (JT) and the modern drug Betadine (BTD). Result indicates the

significant faster reduction of the wound area as compared to JT and BTD.<sup>[14]</sup>

#### 4. CONCLUSION

Pharmacognostical profile of this indigenous medicine helped to find out the medicinal potential and its reason. Flower of *M. elengi* is rich source of calcium oxalate crystals and phytoconstituents. From critical analysis of review of literatures, the pharmacological studies of the flower part of *M. elengi* revealed that this single drug can find out its widespread use.

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