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Review Article

Introduction Of Lord of Shiva Plant: A Review

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ARTICLE INFO	ABSTRACT
Published: 14 May 2025 Keywords: Aegle marmelos, morphology, chemical constituents, uses traditional uses, pharmacological activities. DOI: 10.5281/zenodo.15402336	Existing generation is a quick generation of allopathic drug, they provide quick consequence. This review is done on Aegle marmelos.[1] From all only tree is aromatic, and rest all the parts are medicinally necessary Fruits, leaves, bark, roots, and seeds are utilized in ayurvedic to cure various diseases. It includes each part of plant chemical constituent and traditional uses. Studies indicate the of Aegle Marmelos are wound healing, antifungal, anticancer, immunosuppressant, antidiarrhoeal activity. Review is intended to know about various phytochemical parameters, traditional uses.[2].

INTRODUCTION

Existing generation is a quick generation & no question about some potency of allopathic drug, they provide quick consequence, but the darkest aspect of this particular medicine is their different side effect and contraindications.^[4] conversely the plants are better switch for those medicines due to their less or no side effect and their capability to heal the problem from their root. ancient system of medicines such as Ayurveda siddha is based on usage of different parts of plant such as leaves, root, stem, fruits, flowers etc. because of growing

awareness among people for natural product. India is the largest producer of medicinal plant life and is rightfully referred to as the "botanical garden of the world. traditional medicine is very common in India due to their extensive pharmacological activities.^[5] Developed and developing nations still depend upon traditional plant drugs as the major mechanism of controlling infections. a number of people are of the view that herbal medicines, commonly called "green medicines," are more healthy and safe in comparison to synthetic drug. The use of traditional medicine is common in India due to its wide pharmacological

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effects. Both developed and developing nations still depend on traditional plant-based medications as a primary method of infection management.^[6] A lot of individuals think that herbal medicines, or what are also called "green medicines," are safer healthier compared artificial and to pharmaceuticals. This review is founded on Aegle marmelos Family Rutaceac. Aegle marmelos is a native Indian root medicinally aromatic primary tree. Tree alone among all is aromatic and rest all of them are medicinally vital Fruits, leaves, bark, roots, seeds are employed for ayurvedic & folk system of medicine treatment of many disease^[7] Constituent such Chemical as Alkaloid, Phenylpropanoid, Tannins, Polysaccharides, Flavonoids, Coumarins, Triterpenoids etc. have been found from different part of plant. This plant has significant potential to treat the disease such as diabetes, cholesterol, diarrhea, dysentery, cancer, cardio protective, peptic ulcer, inflammation. antibacterial. anti fungal, radioprotective, antipyretic, analgesic, constipation, respiratory infection, antioxidant. wound healing and many more.^[8]

Table no.1 Taxonomical Classification of Aegle		
marmelos ^[9]		

Taxonomical Rank	Taxon	
Kingdom	Plantae	
Division	Magnoliophyta	
Class	Magnoliopsida	
Order	Sapindales	
Family	Rutaceae	
Sub family	Aurantioideae	
Genus	Aegle	
Species	A. marmelos	
Common name	Bael Patra	

Biological Source

Bael consists of the unripe or half-ripe fruits or their slices or irregular pieces of Aegle marmelos belonging to family Rutaceae.

Geographical Source

Sub-Himalayan tract and throughout India, especially Central and Southern India, Burma, occurring as wild and also cultivated.

Collection

Tree is deciduous of around 12 m height. It is the sacred tree and leaves called Bale Patra are utilized for the worship of Lord Shiva. Tree possesses straight, sturdy spines, trifoliate compound leaves and berry fruit. Fruits are harvested from April-May. After harvest, epicarp is removed and typically cut into transverse slices or irregular pieces.

Morphology

Leaves

The leaves of A. marmelos are alternate, trifoliate, aromatic, deciduous borne as single or compound width consists of 3 to 5 oval, pointed shallowly, thin toothed leaflets with length 4-10 cm and 2-5 cm in minal one have long petiole while the lateral one is petiole less. Leaves have 3 to 5 leaflets. Leaf petiole is long and glabrous. Mature leaves have a foul smell when bruise.^[10]



Figure1: leaves of aegle marmelos

Flower



Flowering takes place typically in month of April and may. Flowers are sweet-scented, 2 cm diameter, erect, stalked, fragrant and consisted of a cluster of approximately 4 to 7 flowers, 4 to 5 recurved fleshy petals, yellowish inside and greenish outside with 50 or more greenish stamens. Calyx is shallow with five short broad teeth, capitate stigma ovary is oblong-ovoid and possesses slightly tapering thick short style^[10]



Figure 2 : flowers of aegle marmelos

Seed

Seeds are hairy, flattened-oblong in shape, which range from 10-50, lodged in the pulp of a fruit and germinate within 2-3 months. The seed is contained in a pouch of sticky transparent mucilage which hardens after drying. A majority of the seeds are aborted during development. Testa is white.^[11]



Figure 3 : seeds of aegle marmelos

Fruit

Bael fruits are generally globose or slightly pearshaped with a hard, woody rind that turns yellow when ripe. They typically range in size from 5 to 20 cm in diameter. The fruit has a hard, smoothwoody shell and contains a central core with 8 to 20 triangular segments filled with aromatic, paleorange pulp^[12]



Figure 4 : fruit of aegle marmelos

Bark

Bark is brownish or grey and has a number of straight long spines. It has gums that usually exudes from injured branches and subsequently hardens. These gums may be described as a white,



gummy sap. It is sweet when tasted for the first time and subsequently imitating to the throat.^[12]



Figure 5 : bark of aegle maemelos

Traditional uses^[13]

Leaf

1. Reducing fever: Used to cure fever.

2. Inflammation: Used to cure inflammation

Flower:

Gastrointestinal benefits: Employed for the treatment of gastrointestinal problems.

distillation of flower produces oil used as scent. Also used as expectorant

Fruit

1.Digestive problems: Used to cure diarrhea, dysentery, and constipation.

2. Respiratory ailments: Used to cure cough, cold, and bronchitis.

Seed:

1. Aromatic and medicinal uses: Seeds are used in traditional medicine due to their aromatic and medicinal uses.

2. Aromatic uses : Gums from seed used as house hold glue

Bark:

1.Fever and malaria: Used in traditional medicine to cure fever and malar

2. Gastrointestinal problems: Used to cure digestive problems.

compounds extracted Chemical from plant

Leaves

Skimmianine, Aeglin, Rutin, Y-sit sterol, ßsitosterol, Flavone, Lupeol, Eugenol, Cineol, citral, Glycoside, O-isopentenyl, Halfordiol, Marmeline, Citronellal, Cuminaldehyde phenylethyl cinnamamides, Eugenol, Marmesininnin

Flower

essential oils : limonene, a-Phellandrene ,ß-Phellandrene ,a-Pinene , Caryophyllene , rutin , quercetin , luteolin , marmelosin ,umbelliferone.

Fruit-

Marmelosin, Luvangetin, Aurapten, Psoralen, Marmelide, Tanninal, limoene, niacin, marmesin, rutin.

Seed-

D-limonene, A-D-phellandrene, Cineol, Citronellal, Citral, P-cyrnene, Cumin aldehyde.

Bark-

Fagarine, Marmin, aegeline, rutin, kaempferol, marmelosin, maemesin, aegeline, rutin, kaempferol.

Phamocoloical Activity

Wound healing activity



Antisepsis was studied by the action of Methanolic extract of seed's ointment and injection of Bael plant against excision wound model in male Wistar rats. Ointment was dressed on the wound until complete healing and observed on 0, 4, 8, 12, 16 and 20 post wounding day101. Results indicated quicker healing rate and exhibited greater rate of contracting wounds compared with the control sample. The rise in the tensile strength in the incision model revealed the healing process of the plant extract102.^[14]

Antifungal

Aegle leaf against marmelos extracts dermatophytid fungi such as Trichophyton mentagrophytes, Trichophyton rubrum, Microscopium Canis & gypsum and Epidermophyton floccose was investigated. Both MIC and MFC were very high in the water and ethyl alcohol extracts and methanol fractions $(200 \mu g/mL)$ against dermatophytid fungi investigated. Important inhibition in dermatophytid fungal growth was observed.^[15]

Anticancer activity

the bark of the tree has compounds with anticancer activity. Anticancer activity The anticancer activity of the plant extract against tumor cell lines was tested by applying sea urchin egg assay, brine shrimp lethality assay and MTT assay method. The plant extract exhibited toxic effects against all the assays93. Jagetia G.C. et al also showed that the hydro alcoholic extract of the leaves has anticancer effects in the Ehrlich ascites carcinoma and suggested that the induction of apoptosis can be due to the presence of skimmianine in the plant extract94.^[16]

Antifungal activity

The ethanolic root extract displayed antifungal activity against A. fumigates and T.

mentagrophytes84. The essential oil obtained from leaves of the Bael plant exhibited antifungal activity against Trichophyton mentagrophytes, T. rubrum ,Microsporum gypsum, Histoplasma capsulatum, A. flavus, M. cookie and Aspergillus niger85^[17]

Immunosuppressant activity

The Fruit Methanolic extract was evaluated for immunosuppressant activity against Wistar albino rats by carbon clearance assay and neutrophil adhesion test. The extract at a dose level of 500 mg/kg was found to possess immunomodulatory activity against the rat model by enhancing the neutrophil adhesion and phagocytic index in carbon clearance assay100.^[18]

Antidiarrheal

Research indicates that Aegle Marmelos root possesses diarrheal extract anti activity. Chloroform extract of Roots was examined by Agar dilution & Disc diffusion method. Activity was observed against strains of Vibrio cholerae, E. coli & Shigella. The invitro study was also found to be comparable to Ciprofloxacin.[13] decoction of unripe fruit impacts the colonization of entero pathogenic Escherichia coli and invasion of entero invasive E. coli and Shigella flexneri by influencing the binding to HEp-2 cells The extract also influenced production of Cholera toxin and binding of both E coli heat labile toxin and Cholera toxin to ganglion side monosialic acid receptor (Gm1).^[19]

Toxicity studies

Aegle marmelos toxicity was examined in rat through Alcoholic, Methanolic and Aqueous extract. Acute, Sub acute and LD50 value were assessed in wistar rat. After 14 days of administration, vital organs like heart, liver. kidney, testis, spleen were accessed by his to pathological study. Significant change from normal was tested. No significant changes were found after 50 mg/kg body weight of Extract was administered intra peritoneally. After LD (50) value calculation by graphical methods, a broad therapeutic window & an increased rate of therapeutic index was observed for A. marmelos extracts. Leaves extract via Intraperitoneal route at dose range of 50, 70, 90 & 100 mg/kg bow for approximately 14 consecutive days to male and female Wistar rats did not exhibit any temporary toxicity. Therefore, it can be say about Aegle Marmelos that it is a drug of high margin of safety ^[20]

CONCLUSION

Due to this competition of neck cutting we are coming across new and complicated health related complications. Society is becoming addicted to synthetic medicines which reflect number of side effects on the other hand Aegle marmelos is far more valuable and safe. It reflects various beneficial medicinal properties. Research is needed for discovery of Mechanism of Action, Bioavailability and efficacy of Various Chemical Constituent which is responsible for exhibiting therapeutic activity. So in close future Bael plant can be utilized as source of significant phyto chemical in Modern system of medicine.

Future scope

At Present Aegle marmelos is now an imported source of medicine for the treatment of different human and animal diseases. In the future Aegle marmelos can be further utilized as a source of useful phytochemical compound and may play a very imported role in modern system of medicine.

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