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Review Article

Introduction Of Lord of Shiva Plant: A Review

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ABSTRACT

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 effects. Both developed and developing nations still depend on traditional plant-based medications

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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 and healthier compared to artificial 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] Chemical Constituent such 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 pear-shaped 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, smooth-woody shell and contains a central core with 8 to 20 triangular segments filled with aromatic, pale-orange 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, ß-sitosterol, 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 marmelos leaf extracts against 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 (200µg/mL) against dermatophytid fungi investigated. Important inhibition in dermatophytid fungal growth was observed.[15]

Anticancer activity

the bark of the tree has compounds with anti-cancer 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 extract possesses anti diarrheal 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.

REFERENCES

1. Venthodika A, Chhikara N, Mann S, Garg MK, Sofi SA, Panghal A. Bioactive compounds of Aegle marmelos L., medicinal values and its food applications: A critical review. Phytotherapy Research. 2021 Apr;35(4):1887-907.
2. Sharma CK, Sharma M, Sharma V. Therapeutic potential of the medicinal plant Aegle marmelos (Linn.) Correa: Insight. Journal of Environmental Pathology, Toxicology and Oncology. 2016;35(1).
3. Mujeeb F, Bajpai P, Pathak N. Phytochemical evaluation, antimicrobial activity, and determination of bioactive components from leaves of Aegle marmelos. BioMed research international. 2014;2014(1):497606.
4. Aronson JK, editor. Meyler's side effects of herbal medicines. Elsevier; 2008 Sep 23.
5. [5] Dubey NK, Kumar R, Tripathi P. Global promotion of herbal medicine: India's opportunity. Current science. 2004 Jan 10;86(1):37-41.
6. Arip M, Selvaraja M, Tan LF, Leong MY, Tan PL, Yap VL, Chinnapan S, Tat NC, Abdullah M, K D, Jubair N. Review on plant-based management in combating antimicrobial resistance-mechanistic perspective. Frontiers in Pharmacology. 2022 Sep 29;13:879495.
7. Ghosh D, Mukherjee PK, editors. Natural medicines: clinical efficacy, safety and quality. CRC Press; 2019 Jul 18.
8. Ansari P, Reberio AD, Ansari NJ, Kumar S, Khan JT, Chowdhury S, Abd El-Mordy FM, Hannan JM, Flatt PR, Abdel-Wahab YH, Seidel V. Therapeutic Potential of Medicinal Plants and Their Phytoconstituents in Diabetes, Cancer, Infections, Cardiovascular Diseases, Inflammation and Gastrointestinal Disorders. Biomedicines. 2025 Feb 12;13(2):454.
9. Sharma N, Dubey W. History and taxonomy of Aegle marmelos: a review. International Journal of Pure and Applied Bioscience. 2013;1(6):7-13.

10. vj j. Phytochemical and pharmacognostic analysis of selected medicinal plants of rutaceae (Doctoral dissertation, St. Teresa's college (Autonomous), Ernakulam).
11. Sharma GN, Dubey SK, Sati N. Evaluation of germination power of Aegle marmelos seeds. J. Chem. Pharma. Res. 2011 Mar 23;3(1):732-6.
12. Rahman MA, Sarkar MN. Bael (Aegle marmelos Correa).
13. Choudhary Y, Saxena A, Kumar Y, Kumar S, Pratap V. Phytochemistry, pharmacological and traditional uses of Aegle marmelos. Pharmaceutical and Biosciences Journal. 2017 Oct 20:27-33.
14. Sharma GN, Dubey SK, Sati N, Sanadya J. Evaluation of wound healing activity of aegle marmelos seed. Pharmacologyonline. 2011;2:171-8.
15. Patil RH, Bhushan C, Sailaxmi S. Antifungal and Antiaflatoxigenic activity of Aegle marmelos Linn. Pharmacognosy Journal. 2009 Dec 1;1(4).
16. Vardhini SP, Sivaraj C, Arumugam P, Ranjan H, Kumaran T, Baskar M. Antioxidant, anticancer, antibacterial activities and GCMS analysis of aqueous extract of pulps of Aegle marmelos (L.) Correa. The Journal of Phytopharmacology. 2018;7(1):72-8.
17. Rana BK, Singh UP, Taneja V. Antifungal activity and kinetics of inhibition by essential oil isolated from leaves of Aegle marmelos. Journal of ethnopharmacology. 1997 Jun 1;57(1):29-34.
18. Pratheepa V, Madasamy D, Sukumaran N. Immunomodulatory activity of Aegle marmelos in freshwater fish (Catla catla) by non-specific protection. Pharmaceutical Biology. 2011 Jan 1;49(1):73-7.
19. Taqvi SI, Rahman A, Versiani MA, Imran H, Khatoon A, Sohail T. Studies to determine antidiarrhoeal and spasmolytic activities of extract of Aegle marmelos. L fruit. Bangladesh Journal of Medical Science. 2018 Mar 23;17(2):205-11.
20. Sekar DK, Kumar G, Karthik L, Rao KB. A review on pharmacological and phytochemical properties of Aegle marmelos (L.) Corr. Serr.(Rutaceae). Asian Journal of Plant Science and Research. 2011;1(2):8-17.

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