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A MINI REVIEW ON MANGIFERIN INDICA (MANGO)

Harsha Vardhan[*1], D. Abhilasha[2], I. Supriya[3], G. Naga Praveen[4] and R. Revanth[5]

[1,4,5]Students of Hindu College of Pharmacy, Guntur, 522002, Andhra Pradesh.

[2]Department of Pharmaceutical Chemistry, Faculty of Pharmacy, Hindu College of Pharmacy, Guntur, 522002, Andhra Pradesh.

[3]Department of Pharmaceutical Chemistry, Faculty of Pharmacy, Nirmala College of Pharmacy, Guntur, 522503, Andhra Pradesh.

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***Corresponding Author**
Harsha Vardhan
Students of Hindu College of Pharmacy, Guntur, 522002, Andhra Pradesh.

ABSTRACT

Mangiferin is a bio active substance primarily extracted from the mango tree, mangiferin (1,3,6,7-tetra hydroxyxanthon-C2-beta-D-Glucoside) has strong anti-oxidant activity and a variety of pharmacological effects, such as anti tumour, neuroprotective, antioxident, anti-inflammatory, anti-diabetic, anti-viral and immunomodulatory as a result it has a number of health promoting qualities and is a good option for additional study and advancement the development of mangiferin as a clinical treatment is, however limited by its low solubility ,mucosal permeability and bio availability in order to increase its use, chemical and physical modification are needed. It inhibits the activation of peroxisome proliferator activated receptor isoforms via altering the transcription process mangiferin suppresses tumor necrosis factor alpha expression inducible nitric oxide synthase potential, proliferation and induces apoptosis to protect against many human malignancies such as lung, colon, breast and neural.

KEYWORDS: Bio active molecules, Human cancers, Mangiferin, Nutrition, Health claims, Toxicity.

INTRODUCTION

Mangiferin is a key ingredient found in Mangifera indica (Anacardiaceae). Mangifera indica and mangifera sylvatica are the genera that include both true wild mango trees.[1]

Figure 1: Structure of mangiferin.

MANGIFERA INDICA DESCRIPTION

- Mangifera indica is a huge evergreen tree with thick, rough, dark grey bark its leaves are linear-oblong or elliptic-lanceolate, 10-30cm long and 2-9cm wide and have a sinous scent.
- The blooms are tiny, reddishwhite or yellowish green, pungently odorous, and meiliferous.
- Fruit develops a huge drupe with extremely diverse shape and size. Fruit skin can be thick or thin, lethary, green, yellowish, or red, and contains amny glands. The flesh (mesocarp) might be pale, yellow, orange, firm, soft, juicy, swet and aromatic.some types of flesh have fibres throughout, whwre as others have few or none.[2-5]

Figure 2: Orbital picture of mangiferin.

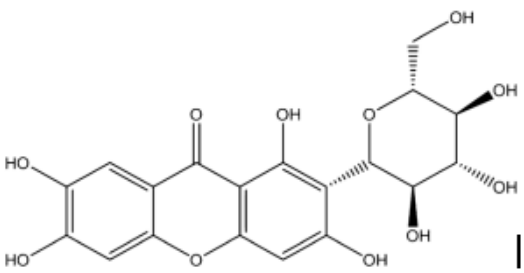
OCCURANCE: Mango grows wild or semi wild across India, primarily in tropical and subtropical island woods, particularly along nullahs and ravines. It is found in the Himalayas, the hills of the western and eastern ghats and the forests of central India, Bihar, Orissa, Assam, and the Andaman islands. It is presently grown in southern china, malaya, indonesia, warmer regions of australia, the philippines, hawaii and the west indies, madagascar and along the coast of tropical africa. In North america it is grown to a limited level in Florida and California.[6-10]

MANGIFERA USE: Mangifera indica is widely utilised in folk medicine for a range of purposes. Root, bark, leaves, flowers, unripe and ripe fruit-solitary, ovoid-oblique, encased in

a hard compressed fibres endocarp, they are acirid, cooling and astringent to the bowels and have been used to treat "Vata", "Pitta" and "Kapha"(Ayurvedic terminology) the above mentioned parts of mangifera indica have also been traditionally used to treat leucorrhoea, bad blood, dysentery, pimples, bronchitis, biliousness, urinary discharges, throat problems, vaginal problems, hiccough, opthalamia, eruption, asthma and labouring under habitual constipation. It is also used as an Aphrodisiac, Tonic, Appetiser, complexion beautifier, Hiccough, laxative, diuretic, stomachic, Antisyphilitic, and tanning agent in various parts of the world.[11-16]

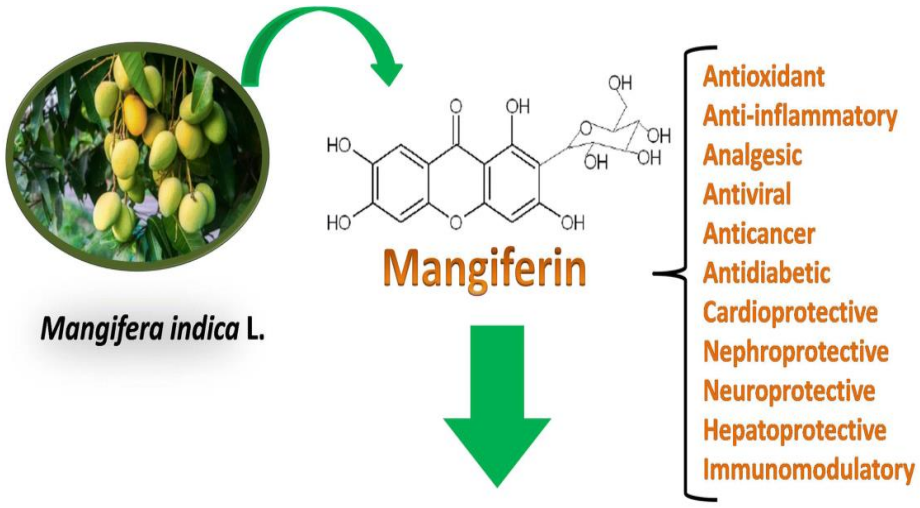
PHYTOCHEMISTRY

- The chemical composition of Mangiferin indica is always of interest.
- The various chemical elements of the plant, particularlu polyphenols, flavonoids and triturpenoids. Mnagiferin, a xanthone glycoside is a prominent bioactive ingredient, as are tannins and gallic acid derivatives.
- The bark contains several compounds, including protocatethic acid, catechin, mangiferin.
- Alanine, glycine, Gamma-amino butyric acid, Kinic acid, shikimic acid and Tetracyclic triturpenoids. Cycloart-24-en-3beta, 26diol, 3-ketodammar-24(E)-en-20S, 26-diol, C-24 eipmers of cycloart-25en 3beta, 24, 27-triol and cyclortan-3beta, 24, 27-triol.
- Polyphenols were identified in mango pure concentrate using HPLC with diode array and mass spectrometry detection.
- A quick method for quantifying beta-carotene, including cis-isomers in dried mango has been established. An HPLC method was used to detect carotenoids in taiwnese mango.
- The approach was evaluated for selectivity, linearity, precision, ccuracy, and robustness. Mangiferin, a natural C-glucoside xanthone, with a molecular weightof 422.35 nd anhydrous melting point of 271 degree celcius. Mangiferin laves fruit, stem, bark Heartwood and roots have all been found to contain homomangiferin is a chemical found in mangiferin indica leaves.[17,18]



MEDICINAL USES

- Mangiferin a naturally occuring xanthone molecule found mostly in mangoes (manifera indica), has sparked widespread interest in the scientific community due to its various pharmacological characteristics.Its potential therapeutic applications.[19-21]
- Span a wide range of diseases, prompting substantial resarch. Antioxidant and anti-inflammatory properties. Mngiferin has strong antioxidant properties, effectively neutralising reactive oxygen species (ROS) such free radicals.
- It is essential for preventing cellular damage and inflammation because it reduces xidative stress.
- This mechanism accounts for its potential advantages in a variety of chronic diseases, including cardiovascular disease, neurological disorders, and inflammatory aliments such as arthritis.
- Mangiferin has been shown to improve insulin sensitivity and glucose absorption, making it an effective antidiabetic agent.[22-27]



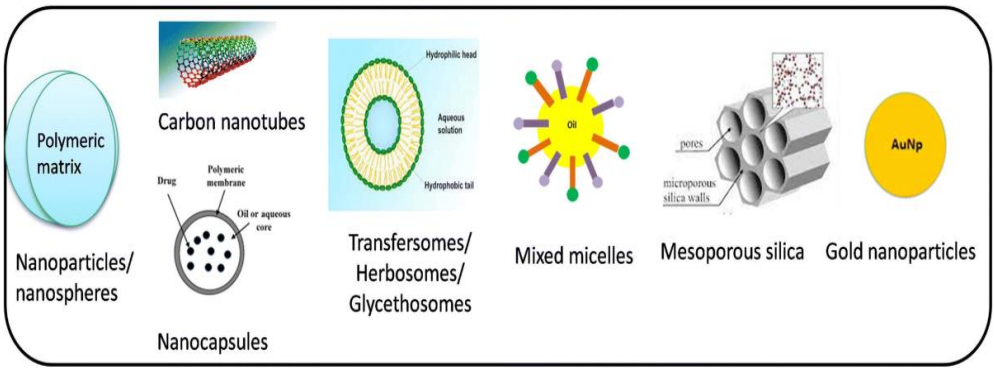


Figure 3: Pharmacological activities of mangiferin.

CARDIOPROTECTIVE EFFECTS

- Mangiferin has been proovben to protect the heart against ischemiareperfusion injury and oxidative stress. It also has antihypertensive properties,which can help to decrease blood pressure.
- These findings point to its potential inovolvement in preventing and controlling cardiovascular disease.[28]

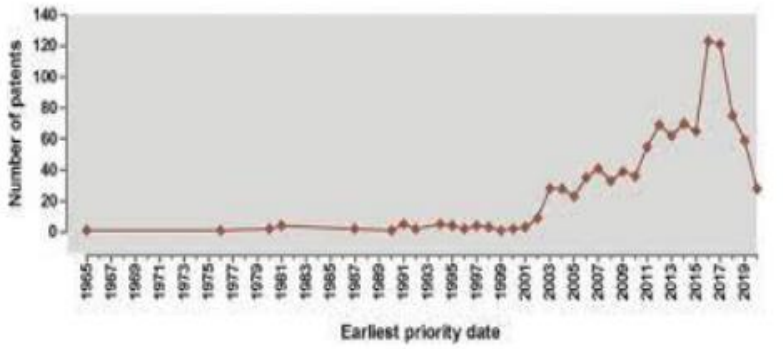
OTHER PHARMACOLOGICAL ACTIVITIES

- In addition to the aforementioned qualities, mangiferin has been shown to have antiviral, antibacterial, antipyretic (fever-reducing), and analgesic (pain-reliving) properties.
- These various effects emphasise its potential as a flexible medical agent.[29-34]
- Health Perspectives: Anticancer Taking safeguards against carcinogens has proven to be an extremely effective anticancer prevention strategy.
- Fruits and vegetables have been found to have anticancer properties due to the presence of bioactive chemicals.
- Mangiferin inhibits and prevents leukaemia in HL-60 cells following theraphy, mangiferin caused cell cycle arrest in the G/M phase.
- Mangiferin inhibits many proinflammatory transcription factors, growth factors, cell-cucle proteins.
- Cytokines, Kinases, adhesion molecules, Chemokines, and inflammtory enzymes during the cmncer start,promotion,nd metstasis stages. Breast cncer is caused by the regultion of gene transcription by oestrogen receptors alpha and beta.[35-38]
- Mangiferin stimulates the oestrogen receptor alpha.

FUTURE DIRECTIONS

While preclinical studies have indicated mangiferin intriguing pharmacologicval potential, more research is needed to completely understand its mechanism of action and opti mise its medicinal applications. This includes well-Designed clinical trials. It also evaluates its efficacy and safety in human beings. Additionally, efforts are being made to increase the bioavailability and pharmacokinetic features of mangiferin in order to improve its therapeutic efficacy. Finally, Mangiferin, a natural chemical obtained from mangoes and other plants, has numerous pharmacological activities, including antioxidant, anti-inflammatory, antidiabetic, anticancer, neuroprotective, and cardioprotective actions. Its broad therapeutic potential

justifies ongoing resarch and development as a potentially natural medicinal agent for a variety of aliments.[39-46]



CONCLUSION

This review summarises different delivery strategies aimed at improving the water solubility and bioavailabilty of the natural chemical mangiferin. The study found that using pharmaceutical carriers s delivery vehicles for mangiferin improved its solubility, permeability, bioavailability, and therapeutic action. This is predicted to improve patient health outcomes in prospective therapeutic applications, particularly when treating a chroniuc liment that requires sustained medical attention, such as in antidiabetic medication. For a long time, the attachment of glucoseto maniferin xanthose nucleus remained an unresolved issue. Resarchers have validated the relationship between lucose and the second location of the xanthone nucleus in mangiferin. Phytochemical resarch on mangiferin often use chemical methods such as degradation and spectrophotometric techniques such as UV, IR, NMR, and mass spectrometry to understand its structure and characteristics. The authors belive there is a strong association between traditional and folklore use of mangiferin and its effectiveness. Recent studies shows that mangiferin, a major chemical constituent pf M. indica, has similar phrmacological activities to the plant extract. Numerous studies have confirmed that.

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