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A Comprehensive Review Of Madhuka (*Madhuca Latifolia* Roxb. And *Madhuca Longifolia* (Koen.) Macbr)

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Abstract: Madhūka, botanically identified as *Madhuca latifolia* Roxb. and *Madhuca longifolia* (Koen.) Macbr, is a versatile plant from the family Sapotaceae, extensively cited in classical Ayurvedic literature. With diverse vernacular names and a broad range of therapeutic applications, Madhūka has been traditionally used in the management of inflammatory disorders, bleeding disorders, and gastrointestinal ailments. This review consolidates references from Vedas, classical Saṃhitās, Nighaṇṭus, and modern scientific literature to present a pharmacognostic, pharmacological, and clinical overview. This comprehensive analysis affirms Madhūka's relevance as a phytomedicine in contemporary healthcare.

I. INTRODUCTION

Traditional Indian medicine recognizes that no natural substance exists without therapeutic value. Among these, Madhūka has occupied a pivotal role in formulations aimed at managing a variety of ailments. The plant, cited across all major Ayurvedic compendia and Nighaṇṭus, is praised for its sweet taste, cooling potency, and nourishing qualities. This review aims to bridge ancient textual references and modern scientific understandings of Madhūka, emphasizing its taxonomic identity, therapeutic attributes, and potential for integrative medicinal use.

II. MATERIALS AND METHODS

This narrative review utilized a qualitative analysis of classical Ayurvedic texts including Caraka Saṃhitā, Suśruta Saṃhitā, Aṣṭāṅga Saṅgraha, Aṣṭāṅga Hṛdaya, and over 20 Nighaṇṭus, as well as scientific databases and standard botany textbooks. Sources were systematically examined for references to Madhūka's synonyms, morphological characteristics, pharmacological properties, and clinical applications.

III. RESULTS AND DISCUSSION

3.1 Classical Literature Review

Madhūka finds mention across all Brihatrayī texts. In Caraka Saṃhitā, it features in several Mahākāṣāyas and is indicated for Raktapitta, Jvara, Vātavyādhī, and Grahaṇī. Suśruta incorporates Madhūka in Shirovirechana and Madhura Varga, suggesting its utility in ENT, blood, and nervous system disorders. Nighaṇṭu literature from the 5th to 19th century AD documents synonyms, properties, and uses of Madhūka. It appears under Sāriva, Āmrādi, and Phala Varga, among others.

3.2 Morphological and Botanical Features

Both species are large deciduous trees with distinct morphological characteristics. *M. latifolia* has broader, leathery leaves and shorter flower pedicels, while *M. longifolia* is characterized by narrow, lanceolate leaves and longer, more drooping flowers. The plants thrive in tropical climates and are frequently found in central and southern India.

3.3 Chemical Constituents

The plant parts contain diverse phytochemicals:

- Leaves: Quercetin, sitosterols, xanthophylls
- Bark: α - and β -amyrin acetates, betulinic acid
- Seeds: Saponins (Mi-saponins A-C), lupeol acetate, oleic and stearic acids
- Flowers: Vitamins A and C, demulcent properties

3.4 Pharmacological Actions

Madhūka exhibits a range of biological activities: anti-inflammatory, analgesic, antioxidant, hepatoprotective, antimicrobial, wound healing, and immunomodulatory. Traditional uses align closely with these, validating its place in Ayurvedic therapeutics.

3.5 Clinical and Industrial Applications

Madhūka is used in preparations for osteoarthritis (as vedanāsthāpana), diarrhea, bronchitis, and gynecological disorders. Its seed oil is commercially valuable for cosmetics, soap, and biodiesel. Madhūka butter is a notable cocoa butter substitute.

DISCUSSION

The convergence of classical and modern insights on Madhūka underscores its significance. Its therapeutic breadth—ranging from systemic inflammation to neuroprotective effects—supports its continued exploration. The plant's robust pharmacognostic profile and adaptability to cultivation on marginal lands further elevate its status as a sustainable resource. However, standardization, clinical trials, and policy integration remain crucial for its broader acceptance.

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