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Unlocking natures pharmacy: constituents and potentials of Bael fruit extract

Unlocking Nature's Pharmacy: Constituents and Potentials of Bael Fruit Extract"
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Bael (Aegle marmelos) also known as Bengal quince belonging to the family Rutaceae, is a hardy subtropical tree native to India and Southeast Asia that has been well documented for both medicinal and nutritional purposes in traditional medicine, including Ayurveda, unani, and siddha systems of medicine for the treatment of gastrointestinal disorders, diabetes, cardiovascular disease, and microbial infections. Bael fruit (Aegle marmelos) has also recently gained momentum as a subject of scientific investigation focused on its potential therapeutic use, particularly regarding prevention and treatment of neurodegenerative disorders. The fruit is composed of a variety of bioactive phytochemicals, including flavonoids (quercetin, kaempferol), alkaloids (aegeline, marmeline), tannins, saponins, and essential oils (eugenol). Given its extensively studied phytochemicals, Bael is showing immense potential for therapeutic applications in neuroprotection in both prevention of, and treatment for, neurodegenerative conditions. Notably, oxidative stress plays a significant role in the pathogenesis of neurodegenerative disorders such as Alzheimer's disease, Parkinson's disease, and other forms of cognitive decline, which are characterized by the death of neurons. The fruit abundant in antioxidants, primarily ascorbic acid (vitamin C), polyphenols and flavonoids, prevent the harmful effects of reactive oxygen species (ROS) and free radicals, leading to lipid peroxidation, damage to DNA, and neuronal cell death. Bael extracts have been shown to increase the activity of the natural antioxidant enzymes including superoxide dismutase (SOD) and catalase, which represent the natural antioxidant defence system in the brain. Furthermore, the direct antioxidant effects of Bael are complemented by their effective modulation of pro-inflammatory cytokines (IL-1β, IL-6, TNF-α)
Keywords
Bael (Aegle marmelos), Neurodegenerative disorders, Phytochemicals, Antioxidants, Oxidative stress

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