

A Review on Bael Fruit Showing Antifungal Activity Against *Candida Albicans* and *Aspergillus Niger*

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Abstract: *The Bael fruit (Aegle Marmelos), a widely recognized medicinal plant in traditional medicine, has gained attention for its antifungal properties. This review highlights its potential effectiveness against Candida albicans and Aspergillus Niger, two significant fungal pathogens causing infections in humans. Various studies reveal that crude and solvent extracts of Bael fruit exhibit promising antifungal activities. For instance, aqueous and methanolic extracts of Bael fruit demonstrated significant inhibitory effects against C. albicans with minimum fungicidal concentrations (MFC) as low as 31.2 mg/ml and moderate effects against A. Niger at 125 mg/ml. The antifungal activity is attributed to bioactive compounds such as Aegeline, lupeol, and γ -sitosterol, which disrupt fungal growth and survival. Additionally, hexane extracts of Bael leaves have been reported to show effective antifungal potential, further underscoring the therapeutic versatility of the plant. This review synthesizes existing research to underline the importance of Bael fruit as a natural antifungal agent, providing an eco-friendly alternative to synthetic antifungals in combating fungal infections. Further investigations are encouraged to explore its clinical applications and efficacy in combination therapies.*

The Bael fruit (Aegle Marmelos), an essential component of traditional medicinal systems, has demonstrated remarkable potential in combating fungal pathogens such as Candida albicans and Aspergillus Niger. These fungi are major contributors to opportunistic infections in humans, particularly in immunocompromised individuals. This review consolidates findings from various studies that have explored the antifungal efficacy of different extracts and bioactive compounds of the Bael plant. Aqueous, methanolic, and hexane extracts of Bael fruit and leaves have shown significant inhibitory effects against these fungal species. For example, methanolic extracts of the fruit have been reported to inhibit C. albicans with minimum fungicidal concentrations (MFC) as low as 31.2 mg/ml, while aqueous extracts demonstrated moderate activity against A. Niger at 125 mg/ml.

The antifungal activity is attributed to the presence of phytochemicals such as aegelin, lupeol, γ -sitosterol, marmelosin, and flavonoids, which act through mechanisms like disrupting fungal cell walls and membranes, inhibiting spore germination, and interfering with fungal metabolic pathway. Hexane extracts of the leaves also demonstrated robust antifungal activity, further emphasizing the plant's versatility.

Keywords: Aegle marmelos, bael fruit, antifungal activity, Candida albicans, Aspergillus niger, phytochemicals, natural antifungal agent, minimum fungicidal concentration (MFC), aegelin, lupeol, γ -sitosterol, marmelosin, flavonoids, fungal infections, synergistic potential, traditional medicine