

Herbal Hand Wash: A Comprehensive Review of Natural Antimicrobial Formulations for Hand Hygiene

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Abstract: Hand hygiene remains one of the most critical practices for preventing the transmission of infectious diseases. While synthetic antimicrobial agents have dominated commercial hand wash formulations, growing concerns about antimicrobial resistance, skin irritation, and environmental impact have sparked renewed interest in herbal alternatives. This comprehensive review examines the current state of herbal hand wash formulations, focusing on their antimicrobial efficacy, safety profiles, formulation strategies, and commercial viability. Through systematic analysis of recent literature, this paper evaluates the potential of various medicinal plants and their bioactive compounds in developing effective herbal hand wash products. The review encompasses traditional knowledge systems, modern phytochemical research, and clinical validation studies to provide a holistic understanding of herbal hand wash technology. Key findings indicate that several plant extracts, including tea tree oil, neem, turmeric, aloe vera, and eucalyptus, demonstrate significant antimicrobial activity against common pathogens while offering additional skin benefits. However, challenges remain in standardization, stability, and large-scale production. This review concludes that herbal hand wash formulations represent a promising sustainable alternative to synthetic products, with potential for further development through advanced extraction techniques and innovative delivery systems.

Keywords: Herbal hand wash, antimicrobial activity, natural preservatives, phytochemicals, hand hygiene, sustainable cosmetics

