



INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI
SHORT ABSTRACT OF THESIS

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SHORT ABSTRACT

In the current landscape of medical practice, the prevalence of evidence-based methodologies and rigorous research standards has significantly influenced the field. However, there has been a noticeable resurgence of interest in ancient healing traditions, notably Ayurveda, garnering attention for its holistic principles steeped in historical knowledge. Ayurveda, esteemed for its comprehensive philosophy has garnered attention from both medical practitioners and patients, presenting itself as a compelling adjunct to contemporary medical approaches. This study investigates the efficacy of Ayurvedic formulations, specifically Haritaki Churna and Amalaki Churna derived from *Terminalia chebula* and *Embllica Officinalis* fruits, in treating colorectal cancer. Structural elucidation and pharmacological profiling of these polyphenols unveil their potential protein targets and mechanisms of action, particularly in influencing metabolic pathways, cancer-related processes, and signal transduction cascades. Protein-protein interaction analyses further underscore key proteins. Molecular docking and dynamics simulations reaffirm the stability and binding affinities of the protein-ligand complexes, thereby reinforcing the potential of these phytochemicals as promising drug candidates. Moreover, investigations into the anti-colorectal cancer properties of Haritaki Churna and Amalaki Churna highlight their significant cytotoxic effects on cancer cells, particularly through modulation of key protein entities involved in cellular signaling pathways. Further mechanistic studies elucidate the multifaceted molecular interventions of ellagic acid and gallic acid, prominent constituents of Haritaki Churna and Amalaki Churna respectively, demonstrating potent anti-cancer effects by inducing apoptosis, modulating cell cycle progression, and disrupting autophagic processes, ultimately impeding Wnt-driven carcinogenesis and inhibiting cancer cell proliferation and survival. In summation, this study presents compelling evidence for the therapeutic potential of Ayurvedic formulations in the management of colorectal cancer, bridging ancient wisdom with contemporary scientific methodologies to pave the way for the development of novel therapeutic interventions rooted in traditional knowledge systems, offering personalized and synergistic approaches for cancer treatment.