

ABSTRACT

Allergic disorders like rhinitis, asthma, urticaria, and dermatitis are rising globally due to environmental, dietary, and genetic factors. Conventional treatments provide relief but often cause sedation, tolerance, and complications, leading to interest in Ayurveda and polyherbal formulations such as Haridra Khanda for holistic, sustainable therapy. Haridra Khanda, enriched with anti-inflammatory, antioxidant, and immunomodulatory properties, has shown potential in allergy management. Studies demonstrate its efficacy in inhibiting histamine release, stabilizing mast cells, and reducing cytokines. The Evans blue dye assay confirmed its ability to reduce allergen-induced vascular permeability, while dye leakage assays highlighted its protective effects on epithelial barriers. In CHO cells, Haridra Khanda inhibited calcium-mediated exocytosis, suggesting its role in histamine release prevention. Guinea pig ileum bioassays further supported its antihistaminic potential. Mast cell stabilization and histamine release inhibition, verified via LC-MS, showcased its direct antihistaminic effects.

LC-qTOF-MS analysis identified active compounds, including flavonoids, contributing to its antioxidant and immunomodulatory roles. Molecular docking revealed strong binding to histamine H1 and Fc epsilon receptors, preventing allergic responses. Drug interaction studies indicated minimal impact on CYP enzymes, ensuring safe co-administration with antihistamines. In murine asthma models, Haridra Khanda reduced airway inflammation, eosinophil infiltration, and IgE levels while suppressing cytokines like IL-4, IL-5, and IL-13, validating its immunomodulatory role. Its safety profile was confirmed via MTT assays, highlighting minimal cytotoxicity.

In conclusion, Haridra Khanda stabilizes mast cells, suppresses histamine, and modulates Th1/Th2 responses, offering a safe, natural, and effective option for managing allergic disorders. These findings underscore its potential for clinical validation.