Evaluation of the effect of plant extracts in alleviating allergic rhinitis in mice

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Outline

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Abstract

Allergy, a chronic inflammatory disease, is a type of hypersensitivity reaction triggered by an abnormal immune mechanism. It can be understood as an immune response causing stimulatory or harmful effects, often resulting in adverse reactions due to repeated exposure to an external stimulus—an antigen. Allergic rhinitis (AR), mediated by Th2 cells, has an increasing incidence worldwide.This study evaluated the immunomodulatory effects of two natural therapies—essential oil from *Chamaecyparis obtusa* (EOCO) and ethanol extract of *Thymus quinquecostatus* (TQ)—in an ovalbumin (OVA)-induced AR mouse model. In the TQ study, OVA-sensitized mice were treated with TQ ethanol extract at doses of 10 or 100 mg/kg post-OVA stimulation.TQ treatment significantly reduced symptoms like nasal rubbing and sneezing, decreased serum levels of Th1 (TNF-α) and Th2 (IL-4, IL-5, IL-6) cytokines, and lowered total and OVA-specific IgE levels, as well as nasal septum and epithelium thickness.In the EOCO study, BALB/c mice sensitized with OVA were administered 0.01% or 0.1% EOCO intranasally from day 22 to 35, one hour before each OVA challenge. EOCO treatment significantly reduced allergic symptoms, OVA-specific IgE levels, inflammatory cell infiltration in the nasal mucosa, and mucus-producing cells. EOCO also inhibited IL-4, IL-10, and TNF-α production in nasal lavage fluid and splenocytes, and reduced Th2 and Treg-related cytokine expression in the nasal mucosa.In conclusion, both EOCO and TQ exhibited anti-inflammatory and anti-allergic effects in the AR model. By suppressing nasal symptoms and reducing inflammatory mediators, these treatments alleviated both early and late phases of allergic reactions, suggesting their potential for alleviating allergic rhinitis.

Kang, S. H., Kim, D. G., Kim, D. K., Kwon, H. S., Lee, N. Y., Oh, H. J., ... & Jin, J. S. (2023). Effects of Thymus quinquecostatus Celakovski on Allergic Responses in OVA-Induced Allergic Rhinitis Mice. *Applied Sciences*, *13*(22), 12449.

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