



# Tree of Heaven Extract Reduces Inflammation and Improves Colonic Tissue in Acetic Acid-Induced Animal Model of Inflammatory Bowel Disease

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## ABSTRACT

**Introduction:** Inflammatory bowel disease is a chronic condition characterized by chronic inflammation of the digestive tract. It has two primary subtypes: ulcerative colitis (UC) and Crohn's disease (CD). While both conditions involve tissue damage, their initial mechanisms and immune system dysregulation differ. Tumor necrosis factor-alpha (TNF- $\alpha$ ) plays a crucial role in both UC and CD, contributing to the pathogenesis of these diseases. This study aimed to investigate the therapeutic potential of the extract from the *Ailanthus altissima* plant (tree of heaven) in treating UC.

**Methods and Materials:** The extract was evaluated for its ferric-reducing capacity, total phenol, and total flavonoid content. Thirty male rats were randomly divided into six groups: a control group, a regular group, a positive control group receiving mesalazine (300 mg/kg), and three treatment groups receiving the *A. altissima* extract at doses of 50, 100, and 200 mg/kg for seven days. All animals, except the standard group, received an infusion of 4% acetic acid into the large intestine. After 48 hours, the animals were euthanized.

**Results:** The results showed that the acetic acid infusion caused severe acute inflammation in the colonic tissue, significantly improved by the *A. altissima* extract at all examined doses in microscopic and macroscopic aspects. TNF- $\alpha$  levels were significantly lower in the mesalazine and 200 mg/kg *A. altissima* extract groups than in the control group.

**Conclusion and Discussion:** The study concluded that the extract of *A. altissima* demonstrated valuable therapeutic effects in treating UC, particularly at 200 mg/kg. The reduction in TNF- $\alpha$  levels, histological data, and macroscopic observations supported the efficacy of the extract. Future studies are recommended to further elucidate the mechanisms of action of this plant extract in treating UC.

**Keywords:** Acetic acid, Ailanthus, Colitis, Inflammatory bowel diseases

