**Crocin modulates IL-4/IL-13 signaling and ameliorates experimentally induced allergic airway asthma in a murine model**

[Haidy Yosri](https://pubmed.ncbi.nlm.nih.gov/?term=Yosri+H&cauthor_id=28738246) [1](https://pubmed.ncbi.nlm.nih.gov/28738246/#affiliation-1) , [Wagdi F Elkashef](https://pubmed.ncbi.nlm.nih.gov/?term=Elkashef+WF&cauthor_id=28738246) [2](https://pubmed.ncbi.nlm.nih.gov/28738246/#affiliation-2) , [Eman Said](https://pubmed.ncbi.nlm.nih.gov/?term=Said+E&cauthor_id=28738246) [3](https://pubmed.ncbi.nlm.nih.gov/28738246/#affiliation-3) , [Nariman M Gameil](https://pubmed.ncbi.nlm.nih.gov/?term=Gameil+NM&cauthor_id=28738246)

**Abstract**

Allergic asthma is a chronic respiratory disease with a prevalent T helper (Th2)-mediated immune reaction. Crocin, the major bioactive constituent of saffron, has been reported in multiple studies to have numerous pharmacological activities, including prominent anti-oxidant activities. In the current study, the anti-asthmatic potential of crocin was evaluated. Adult male Swiss Albino mice were administered 10mg of ovalbumin (OVA) mixed with 1mg of aluminum hydroxide intraperitoneally on days 0 and 7 and were administered crocin (25mg/kg) orally daily for 16days. Asthma progression was associated with significant increase in the lung/body weight index, inflammatory cell counts in bronchoalveolar lavage fluid (BALF), lung total protein content, and serious index of lung permeability, indicating pulmonary edema with accumulation of serous fluids within the lungs. Serum lactate dehydrogenase (LDH) activity and lung malondialdehyde (MDA) content were significantly increased, while lung superoxide dismutase (SOD) activity, reduced glutathione (GSH) levels, and serum and lung catalase activities were significantly decreased. These changes reflect significant pulmonary inflammation with concomitant disturbance of oxidant/antioxidant homeostasis. Moreover, tumor necrosis factor (TNF)-α, interleukin (IL)-4, and IL-13 contents in the lung were also significantly high after OVA sensitization. Crocin treatment significantly alleviated the OVA-induced allergic asthma-associated alterations in inflammatory and oxidative stress biomarkers. Crocin enhanced anti-oxidant defenses, reduced the incidence of oxidative stress, and restored pro-inflammatory cytokines to normal levels. Histopathological analysis showed significant lung improvement in crocin-treated mice. In conclusion, crocin showed a significant protective effect against allergic asthma progression, which was associated with down-regulation of inflammatory cytokine expression and restoration of oxidant/antioxidant homeostasis.

**Keywords:** Allergic asthma; Crocin; Interleukin-13; Interleukin-4; TNF-α.