

## **Abstract**

**Objective:** Crocin, a diterpenoid glycoside that has been shown to have many functions, such as anti-inflammatory, anti-oxidative stress, smooth muscle relaxant and anti-allergy. In this study, we evaluated the potential role of crocin on CHOP and Caspase 12 protein levels as proteins involved in the apoptotic pathway in the lung tissue of ovalbumin-sensitized mice.

**Method and Materials:** Mice were divided into 5 groups (10 mice in each group): control group, ovalbumin group (OVA), ovalbumin + crocin 30 group (OVA +Cr30), ovalbumin + crocin 60 group (OVA +Cr60) and And the asthmatic group + dexamethasone (OVA + Dex) . Mice were sensitized by ovalbumin or normal saline and at the end of the study, the rate of inflammation, pathological changes and the expression of Nrf2 and HO-1 genes in the lung tissue of mice were determined.

**Results:** Sensitization with ovalbumin significantly increased the pathological changes and inflammation of the lung tissue compared to the control group. On the other hand, as a result of ovalbumin sensitivity, the expression of Nrf2 gene in lung tissue of mice showed a significant decrease compared to the control group ( $P < 0.001$ ) and the expression of ICAM-1, and VCAM-1 genes in lung tissue showed a significant increase compared to the control group ( $P < 0.01$ ). Intervention with crocin significantly inhibited the amount of pathological changes in the lungs and inflammation due to sensitivity to ovalbumin. In addition, intervention with crocin (especially at high concentrations) significantly increase the expression of Nrf2 and reduced the expression of ICAM-1, VCAM-1 genes.

**Conclusion:** These results showed that crocin suppressed airway inflammation and corrected the expression of Nrf2 and suppressed the expression of IL-17 and NF- $\kappa$ B in the asthmatic model of mice, so crocin may have great potential for asthma treatment.

**Keywords:** Asthma, airway inflammation, mice, Nrf2 , ICAM-1, VCAM-1.