**Safranal of Crocus sativus L. inhibits inducible nitric oxide synthase and attenuates asthma in a mouse model of asthma**

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**Abstract**

The present study involves evaluation of antioxidant potential of Crocus sativus and its main constituents, safranal (SFN) and crocin (CRO), in bronchial epithelial cells, followed antiinflammatory potential of the active constituent safranal, in a murine model of asthma. To investigate the antioxidizing potential of Crocus sativus and its main constituents in bronchial epithelial cells, the stress was induced in these cells by a combination of different cytokines that resulted in an increase in nitric oxide production (NO), induced nitric oxide synthase (iNOS) levels, peroxynitrite ion generation, and cytochrome c release. Treatment with saffron and its constituents safranal and crocin resulted in a decrease of NO, iNOS levels, peroxynitrite ion generation, and prevented cytochrome c release. However, safranal significantly reduced oxidative stress in bronchial epithelial cells via iNOS reduction besides preventing apoptosis in these cells. In the murine model of asthma study, antiinflammatory role of safranal was characterized by increased airway hyper-responsiveness, airway cellular infiltration, and epithelial cell injury. Safranal pretreatment to these allergically inflamed mice lead to a significant decrease in airway hyper-responsiveness and airway cellular infiltration to the lungs. It also reduced iNOS production, bronchial epithelial cell apoptosis, and Th2 type cytokine production in the lungs.

**Keywords:** AHR; Crocus sativus; apoptosis; cytochrome c; cytokine; nitric oxide synthase.