



CROCUS SATIVUS TEPALS EXTRACT AS A PROMISING TREATMENT FOR OBESITY-RELATED METABOLIC DISORDERS

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Obesity and the associated metabolic complications have become a global health problem for which the usual therapeutic strategies are only of limited effectiveness. To date, saffron (*Crocus sativus* stigmas) has been used primarily in the food, cosmetics and pharmaceutical industries. While numerous studies have confirmed the potential of *Crocus sativus* stigmas to combat obesity, the role of *Crocus sativus* tepals, which are usually wasted during saffron production, as a source of bioactive compounds is still unexplored.

To this end, we investigated the effects of oral administration of an extract of *Crocus sativus* tepals in an animal model of diet-induced obesity. We analysed visceral (VAT) and subcutaneous (SAT) adipose tissue and lipid metabolism in mice fed a 60% fat diet for 14 weeks and orally treated with an extract of *Crocus sativus* tepals for the last 5 weeks of the diet. Energy intake, body mass, triglycerides, systemic insulin sensitivity, adipose tissue histology, insulin signalling and lipid metabolism in VAT and SAT were analysed.

We have demonstrated for the first time that oral administration of an extract of *Crocus sativus* tepals in obese animals results in weight loss, improved systemic insulin sensitivity, lower triglyceride levels and improved lipid peroxidation. Treatment with *Crocus sativus* tepals extract had a suppressive effect on SAT hypertrophy, while it was absent in VAT, suggesting that treatment with *Crocus sativus* tepals extract has differential local effects on adipose tissue development and metabolism. The suppressive effect on hypertrophy of subcutaneous adipocytes was accompanied by reduced inflammation and preserved insulin signalling in this tissue, which most likely contributed to the improved systemic insulin sensitivity.

Considering the results obtained, future pharmaceutical/nutraceutical interventions to improve subcutaneous adipocyte function may help to maintain adequate insulin sensitivity and reduce the risk of developing obesity-related complications.

Keywords: *Crocus sativus*, Adipose Tissue, Obesity, Insulin Sensitivity, Lipid Metabolism

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