

NOTE**Effect of Saffron Extract on Pituitary-Testis Axis in Mice**

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The object of the present study is to assess the efficacy of *C. sativus* in the hormone changes in pituitary-testis axis of mice. Four groups including eight adult male Balb/C mice weighing 30 ± 5 g were used in this study. Normal saline administered as placebo to control group and saffron extract in doses of 25, 50 and 100 mg/kg/48 h were injected intraperitoneally for 20 d to experimental groups. FSH, LH and testosterone in serum samples, were measured by ELISA. In comparison with placebo the level of FSH, LH and testosterone significantly increased in 100 mg/kg saffron treated group, but no significant differences were observed between other treatments and placebo. The results of this study indicate the efficacy of saffron extract in the male reproductive endocrine function and showed that it can modify the reproduction activities.

Key Words: Saffron, Pituitary-testis.

The dried stigmata of *Crocus sativus* L (saffron) is commercially available in superstores. It is popular because of its delicate aroma and attractive colour. It can be used as a food additive too. Saffron also is used in folk medicine for various purposes as aphrodisiac, anti spasmotic¹, antidepressant², antiinflammatory³ and in treating various human disorders such as heart and blood disorders⁴ and neuronal injury⁵. Recently, modern pharmacological studies have demonstrated the extract of *Crocus sativus* has antitumor⁶, antimutagenic activity⁷ and inhibits nucleic acid synthesis in human malignant cells⁸. *C. sativus*' extract consists of many compounds such as α -crocetin, a water soluble carotenoid, crocins (crocin, di-crocin and tri-crocin), picrocrocin and safranal⁹. The protective activity of carotenoid against cancer has been reported by a large number of studies. However, little attention has been given to the physiological effects of *C. sativus* extract on reproductive system⁷. It was of interest to study any possible action of various concentrations of the extract of *Crocus sativus* on male reproductive system of mice.

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This study was carried out on adult male Balb/C mice (30 ± 5 g) from Pasteur Institutes, Karaj, Iran. Animals were randomly divided into four experimental groups (8 mice per group), the control and three experimental groups were housed in Plexiglas cages (40 cm long \times 20 cm high \times 30 cm wide) four per cage, in a regulated environment (25 ± 1 °C; 50-55 % relative humidity; 12 h light/dark cycle), with free access to food and water.

Extract: Air-dried and powdered stigmata of saffron (100 mg) were macerated with 5 mL of normal saline and incubated for 2 h at room temperature. The extract was then, centrifuged at 5000 rpm for 5 min and then upper solution carefully aspirated in a test tube. The dried sediments were weighed. The volume of upper solution should be risen so that 10 mg/mL solution was prepared.

Administration: Extract was injected intraperitoneally every 48 h for a period of 20 d. The day after last injection the animals were mildly anesthetized and blood collection was performed directly from heart.

Statistical analysis: Probability test, as well as one way analysis of variance, followed by Duncan test, were used for statistical evaluation. The p-values less than 0.05 were considered to be statistically significant.

FSH: Analysis of Post-hoc comparisons ($p < 0.05$) showed that there is a significant difference between the 100 mg/kg-treated and placebo-controlled mice. But no significant differences were identified among various treatment groups.

LH: Post-hoc comparisons indicated that the level of LH in 100 mg/kg treated mice discriminated significantly higher than placebo and 25 mg/kg treated mice. Statistical evaluation did not show any significant difference between 50 and 100 mg/kg treated mice.

Testosterone: Intraperitoneal *C. sativus* extract administration also increased significantly the level of testosterone in 100 mg/kg treated group as compared to the placebo control and other experimental groups. No significant differences were identified among various experimental groups (Fig. 1).

The gonadotropin-releasing hormone (GnRH) from the hypothalamus acts on the anterior pituitary to release both the FSH, which stimulates gametogenesis and LH, which stimulates androgen secretion¹⁰. The gonadotropins assessment in this study revealed a concomitantly increase in the sermic level of testosterone with the level of FSH and LH. Thus indicating a possible role of the hypothalamo-pituitary-gonadal axis¹¹. This effect could be probably due to the increase in the release of FSH and LH from the anterior pituitary followed by testosterone increase. The histological evaluation in the *C. sativus* treated animals indicate that the saffron extract probably act by raising testosterone levels. particularly increase the primary spermatocytes number without producing any spermatotoxic effects (data not shown).

Crocus sativus has also been used in traditional medicine as an aphrodisiac. The present study indicates efficacy of saffron extract in Pituitary-testis Axis in mice., The dose of 100 mg/kg/48 h seems to be effective in this activity. Further studies need to show the mechanism(s) of this activity.

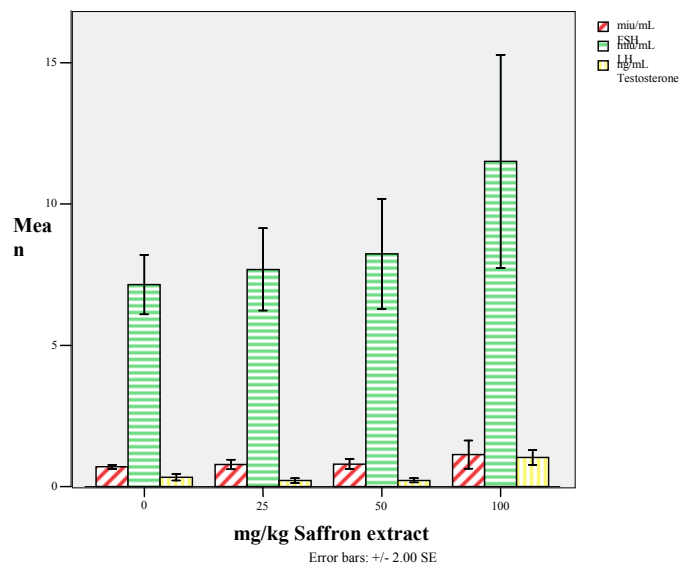


Fig. 1. Effect of saffron extract on FSH, LH and testosterone. Values are mean \pm 2 SE, * $p < 0.05$, compared to the control

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