**P2-14. Intercropping saffron (*Crocus sativus* L.) with cereals, pulses and medicinal plants**

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Saffron (*Crocus sativus* L.) is a valuable plant which is mainly grown in Iran, India and Greece. The life cycle of this plant is short and therefore it does not occupy the land during the whole year, and hence possibility of saffron intercropping with other crops may economically be feasible. To evaluate the potential of intercropping of saffron with other crops, this experiment was conducted in the research field of Faculty Agricultural, Ferdowsi university of Mashhad in 2006-2007. This study arranged as a Randomized Complete Blocks Design (RCBD) with three replications. Treatments were different combinations of saffron with three groups of crops including cereals: Spring and Winter Wheat (*Triticum aestivum*), pulse: Chickpea (*Cicer arietinum*) and Lentil (*Lens culinaris*), and medicinal plants: Ajowan (*Carum copticum*), Black Seeeds (*Nigella sativa*), Flixweld (*Discurinia sophia*), Green Cumin (*Bunium persicum*) and Psylium (*Plantago ovata*) in a row replacement series arrangement. A pure stand of saffron was also included in the treatments for comparison purposes. Results showed that relative advantage of saffron intercropping with other crops in terms of Relative Value Total (RVT) was only shown in saffron intercropping with Black Seeds and Ajowan. These values were 1.56 and 3.29 for intercrop of saffron with Black Seeds and Ajowan, respectively. However, the highest yield of saffron was obtained in pure stand (0.79 kg/ha) and the lowest yield was in mixture with Ajowan (0.01 kg/ha). There was no difference between intercrop treatments in terms of saffron yield. This was also true for number of corms per plant, number of buds per corm and also fresh and dry weight of corms in a 50 cm planted row. Yield of saffron was reduced with increasing irrigation frequency (water needed for companion crops) ($p<0.05$), but there was a positive relationship between RVT and irrigation frequency ($p<0.01$).

**Keywords:** intercropping, irrigation, medicinal plant, RVT, saffron

**P2-15. Determination of phenolic compounds in *Crocus sativus* L. corms in related to dormancy & waking by GC-MS**

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*Crocus sativus* L., cultivated since ancient times as the source of Saffron, is a triploid plant that can be propagated only via its corms which undergo a period of dormancy. Phenolic compounds are the important component in vegetable foods, infusions & tisanes for the beneficial on human health. In this research, first, we hydrolyzed the dormant & waking corms by HCL 2M, extracted by methanol 80%, drying under nitrogen flow &then silylation & injected to GC-MS. Also we determinate the total content of phenolics by Spectrophotometric method, using Folin- sioculteu, Folin-Denis, saturated sodium carbonate. For qualitative analyzes of phenolics, TLC method was used. The effect of different solvents in extraction of phenolics, such as ethanol 50%, 80%, methanol 80%, acetone 80% & water, were investigated. After analyzed samples, the results have been shown that, the concentration of phenolics in dormant corms that we collected in summer & the end of winter corms, waking corms, have been significant & in dormants were higher than the other. The TLC results on Silica have been shown that polyphenols are the most important of phenolics in corms.

**P2-16. Peroxidase: as a marker for dormant and waking stages of saffron growth**

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Saffron (*Crocus sativus* L.) as an important plant growing in dry lands, have many clinical and additive effects so many studies are being done to light on clandestine aspects. Literatures indicate that peroxidase enzyme participates in many different cellular processes such as auxin metabolism, wood formation, cell cement, response to external stresses and so on. In this study, the plant corms in two different months –July and November as dormant and waking stages of saffron growth, sampled and then extracted based on partially purification with DEAE-Sephadex ion-exchange chromatography. Then, peroxidase extract analyzed quantitatively (spectrophotometry) and qualitatively (PAGE electrophoresis). To the end kinetic measurements were done according to different pHs and different substrate concentrations. As a notable result, distinctive differences were seen between peroxidase activity of dormant and waking saffron stages (high activity in waking saffron corms). Kinetic measurements revealed that there are different optimum pH and substrate concentrations for enzyme in two life periods of saffron corms. All the results are in coincide with other documents focused on cell metabolism and enzyme activities in growth periods of plants.

**Keywords:** dormancy, ion-exchange chromatography, peroxidase activity, pH, saffron, waking