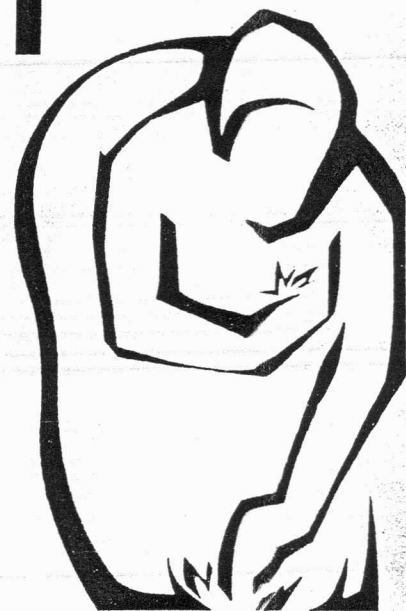


3rd International Symposium on Saffron

FORTHCOMING CHALLENGES
IN CULTIVATION , RESEARCH
AND ECONOMICS



www.saffronsymposium2009.org

**KROKOS, KOZANI, GREECE
20-23 MAY, 2009**

BOOK OF ABSTRACTS



age for two years in, city of Sari, with "moderate and humid" conditions similar to East Europe. Saffron flowers were harvested from three different areas in Khorasan, the most popular saffron production site in the world. To evaluate the impact of style content of saffron and also the physical properties on colour variation patterns during storage, dry saffron samples were produced with three different style contents jointed with stigma and also two physical properties, powder and filament. The data were analyzed using GLM procedure of SAS (2001). Results showed that physical properties of saffron had significant impact on the pattern and quantity of colour changes during the time ($p < .001$). Time of storage had significant impact on colour deterioration patterns ($p < .001$). The reliability of the models with comparison of the real data with the predicted outcomes had been proved. The results demonstrated the colour deterioration was steep at the first months after harvesting and then reached a plateau during the time. The results of this study also proposed valid models for prediction of saffron colour strength for two years after harvesting in the selected climate.

Keywords: colour strength, Iran Sari, modelling, saffron

P4-07. The allelopathic effect of aquatic saffron extract on different weed species

M. Naseri, K. Orooji, Z. Avarseji* and M. Sabet Teimuri
Ferdowsi University of Mashhad, Département of
Agronomy, 00981 Mashhad, Iran
*Zeinab.avarseji@gmail.com

Saffron is one of the most important crops in Central and Southern Khorasan province. Recently weed scientist are more interested in weed management by allelopathy. The main objective of the study was to evaluate allelopathic potential of Saffron (*Crocus sativus* L.) on Mountain Rye (*Secale Montana*), Flixweed (*Descurainia Sophia*) and London Rocket (*Sisymbrium irio*). In order to, an experiment was conducted in the laboratory of faculty of Agriculture in Ferdowsi University of Mashhad. Treatments were different concentrations of corm and coverage aquatic extract (0, 3, 6, 10% m/v) and three weed species. The experiment was based on Completely Randomized Block Design with four replications. The results indicated over ally that the germination percentage was decreased by increasing the concentration of extracts. In S. Montana 20% concentrations and coverage extract had maximum effects on decreasing germination percentage but about D. Sophia corm extract was be most effective. In this weed, increasing concentration from 10 to 20 simulated germination 60% (32 to 92) and no observed predictable trend with increasing concentration. In this case, we had "saw thoos" trend in curve. For S. irio, there is no significant difference between corm and coverage extract but both extracts inhibited germination of seeds in 20 %. Corm and coverage extract decrease rate of germination in D. Sophia and S. Montana but not about S. irio. This study indicated that different Species had various sensivity against allelochemicals and also these results suggest, saffron overly had harmful effects on Weed Species in our

study and saffron had potential that could be use as a hammer for suppression of weeds.

Keywords: allelochemical, aquatic extract, saffron, saw thoos, weed species

P4-08. Modelling of chemical characteristics of saffron stigma during storage for shelf-life estimation

M. Bolandi*, F. Shahidi, N. Sedaghat, R. Farhoosh,
M. Nassiri-Mahallati and H. Mousavi-Nik
*Islamic Azad University, Damghan Branch, Damghan,
Iran
mbolandi@yahoo.co.in

The saffron stigma is the most common form of saffron in international trade market. The way saffron stigma is preserved during storage is a very important factor, which determines the final quality of dried stigmas. In this research, the effect of different storage temperature (20°C, 30°C and 40°C) and water activity (0.32, 0.52 and 0.75) on chemical characteristics of saffron stigma stored in both dark and light for 12 weeks have been studied using spectrophotometry technique. The changes of colouring strength, aroma and bitterness in above mentioned conditions were modelled representing different patterns. The results showed, as the temperature and water activity increased, the reaction rate changed noticeably such that the colouring strength reduction at 40°C and 30°C were 30% and 12%, compared to the sample kept at 20°C in dark, respectively. Also, increasing water activity from 0.32 to 0.52 and 0.75 in dark, the colouring strength reduced 8.5% and 45% respectively. So, the effect of higher water activity on colouring strength reduction was stronger than higher temperature. Furthermore, after 12 weeks of storage, the colouring strength and bitterness decreased whereas the aroma increased. Since the colour deterioration was noticeable compared to other chemical characteristics, the shelf-life was calculated according to colouring strength reduction. The cut-off point was considered as $E^{1\%}_{440nm} = 140$, the least acceptable colouring strength for grade 4 saffron stigma in Iran. According to the models, the shortest shelf-lives of stigma were corresponded to the samples with $a_w = 0.75$ estimated as 2.96 and 3.61 weeks for the samples exposed to light and kept at dark, respectively.

P4-09. Fraud identification of safflower in commercial saffron using RAPD/SCAR method

N. Javanmardi*, A. Bagheri^a, A. Hemati Kakhki^b, A. Sharifi^c and N. Moshtaghi^a
^aCollege of Agriculture, Ferdowsi University of Mashhad, P.O. Box 91775-1163 Mashhad, Iran
^bKhorasan Research Institute for Food Science and Technology, Mashhad, Iran
^cIranian Academic Culture foe Education, Culture & Research-Branch of Mashhad, Mashhad, Iran
*Najme.javanmardi@gmail.com

Saffron (*Crocus sativus* L.) is the most valuable and indigenous crop in Iran. Stigmas of this plant are used as a



pular natural flavouring, colouring and medicine. However, due to high profit, the market suffers fraudulent activities where the saffron stigma is often mixed with safflower petals. The identification of these frauds with conventional and biochemical methods is difficult with low sensitivity; therefore, the employment of molecular markers such as RAPD/SCAR is being considered as a viable solution. In this study, DNA was extracted from dry stigmas of 5 saffron accessions and dry petals of 7 safflower cultivars. RAPD reactions with ten 15-mer random primers resulted in two specific monomorph bands (500 and 700bp) for safflower without any band in saffron. These bands were cloned in suitable vector and sequenced. PCR analysis with specific SCAR primers amplified two specific bands (414 and 589 bp) for safflowers in different combination of saffron stigmas and safflower petals even in low combination (2.5 %). So this method is suitable for identification of safflower petal frauds in commercial saffron stigmas.

Keywords: fraud identification, rapd/scar, safflower, saffron

P4-10. Concentration of polyphenolic compounds and antiradical activity in saffron petals extract

A.Hemati Kakhki*, F. Tajalli, S. Gazerani
and M. Khatami Rad
Khorasan Research Institute for Food Science and
Technology Institute, P.O.Box 91735-139 Mashhad, Iran
*Hemati@kstp.ir

Saffron flower is widely cultivated in Iran that products the dried red stigma with waste. Many compounds and properties of stigma have been considered as volatile agents (safranal), bitter principles (picrocrocin), dye materials (crocin and its glycosidic, crocin) and pharmacologically actives, but characteristics of saffron petal haven't been studied yet. Therefore, the aim of this study was evaluating the radical scavenging activity of methanol extract of the saffron petal and to recover a functional and antiradical compound from this waste and also for environmental treatment. For this purpose, radical scavenging ability of methanolic extract of dried petal is determined with DPPH method. For this trial the effect of 3 different dilutions (100, 200 and 300 µg/L) of saffron petal extracts was used. It was appeared that with rising of concentration and there is a little difference between 100 and 200 concentrations in radical scavenging activity. Also, saffron extract showed better effects in the high concentrations in comparison with ascorbic acid. To determine of polyphenolic compounds amount, 0.2 mL Extract, 1 mL Folin sioculteu indicator and 0.8 mL Na₂CO₃ (7.5%) were mixed and the absorption was measured in 765 nm by spectrophotometer after 30 minutes. An equation was resulted from standard galic acid curve for determination of Polyphenolic Compounds Amount. Regarding to the results of this research, saffron petal can be used as a rich source of functional and antiradical compound and anti-cancer drugs production.

Keywords: antiradical activity, DPPH, polyphenol compounds, radical scavenging activity, saffron petal

P4-11. Effect of saffron's petals water extract on rye (*Secale cereale* L.): seedling growth and establishment

M. Ahmadi, M. Tatari* and R. Abbasi Alikamar
Islamic Azad University of Shirvan, Iran
*mar_tatari@yahoo.com

In order to investigate the effect of saffron water extract on rye (*Secale cereale* L.) seedling growth, an experiment was carried out in 2008 in Dryland Research Station of North Khorasan. Rye seeds were planted in plastic pots and irrigated by 5 level of treatment (0%, 25%, 50%, 75% and 100%) that was made from 5% concentration of saffron petals water extract. The experiment was conducted on the basis of complete randomized design with four replications. The pots were kept at 25°C in germinator and the seedlings height was recorded daily. Results showed that the highest seedlings were obtained from 25% level of concentration which had no significant difference with control (0% level). High concentration level (100%) had significant effects on seedling height and the shortest seedlings were observed in this treatment. The highest and lowest weight of seedling was observed in 25% and 100% level respectively. Growth rate graphs (basis of daily records) confirmed the suppressive effects of high concentration level (100%) especially in the last days of experiment. It seems that the low concentrations of saffron petals water extract promote and the high concentration inhibits the growth of rye seedlings.

Keywords: petal, rye, saffron, seedling growth, water extract

P4-12. Effect of saffron's petals water extract on wheat: seedling growth and establishment

M. Tatari^a*, R. Abbasi Alikamar^a, M. Ahmadi^b
and A. Hosseini^c
^aIslamic Azad University of Shirvan, Shirvan, Iran
^bDryland Research Station of North Khorasan, Shirvan, Iran
^cIranian Academic Center for Education, Culture and Research, Mashhad, Iran
*mar_tatari@yahoo.com

Large amounts of saffron petals are disposed off every year while using them as an organic source can open a new approach on reusing them. In order to investigate the stimulatory or inhibitory effects of saffron's petals on the emergence of wheat, an experiment was conducted on the basis of complete randomized design with four replications in 2008 in Dryland Research Station of North Khorasan. 5% concentration of saffron petals' water extract (50 grams oven dried petals in 1000 ml water) was used to prepare 5 levels of treatment (0%, 25%, 50%, 75% and 100%). These treatments were used to irrigate wheat seeds (20 ml each day), which were planted in plastic pots and