

## QUALITY CONTROL OF SAFFRON AND ITS ADULTERATION BY THIN LAYER CHROMATOGRAPHY

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**Introduction:** Saffron is a spice from *Crocus sativus* L. flowers (Iridaceae). It is the perennial meadow plant that reaches 10-25 cm and grows from bulbs of *C. sativus*. Consists of dried and red stigma. World production of saffron is about 180 tons per year 90% of them are made in Iran and the rest in India, Greece, Morocco, Italy, Spain and other countries. Saffron contains more than 150 volatile and aromatic compounds, mainly terpenes, terpene alcohols and their esters. The bitter taste and iodine or hay aroma are caused by the chemicals components – picrocrocin and safranal. Saffron also has a crocin belonging to the carotenoid group and has an antihypertensive, anticonvulsant, antitussive cytotoxic action, anxiolytic aphrodisiac, antioxidant, antidepressant, antinociceptive, anti-inflammatory and relaxant activity. It also improves memory and learning skills, as well as increases blood flow to the retina and vasculature. Saffron is included in various pharmacopoeias of the world, such as European Pharmacopoeia 2014, Pharmacopoeia of the People's Republic of China 2005, African Pharmacopoeia 2004. Saffron is one of the most expensive spices in the world, and because of this fact saffron is falsified. To date, there are many fake saffron spices on the market. It is because of these fakes that the International Organization for Standardization has established the standard of saffron original. In addition, the use of pure raw materials in medicine is also important.

**Aim:** Comparison of saffron adulteration, identification of differences with saffron.

**Materials and methods:** Saffron stigma; Turmeric (*Curcuma longa*, Turmaric, Indian saffron) – crushed rhizome; *Tagetes minuta* (Imeretian saffron, Zafaran – marginal flowers); *Tulip* “Purple Palette” – stamens; Safflower (*Carthamus tinctorius* L., Saflor, American Saffron) – marginal flowers; *Calendula officinalis* L. – marginal flowers. For the analysis, 3 series of Ukrainian saffron were taken, methanol extraction was performed as suggested by the European Pharmacopoeia Ph. 9.0, chromatography on plates with Merck Millipore R GOG F<sub>254</sub> silica gel, size 20×10 cm in a mixture of solvents: water, 2-propanol, ethyl acetate (10:25:65). After drying, the chromatogram was viewed in daylight, in UV light at 254 nm and in daylight after treatment with the anisaldehyde solution. Further, the experiment with saffron falsification was performed.

The **results obtained** confirmed the hypothesis, because the characteristics of falsifications completely different from the characteristics of pure saffron. The samples of the falsifiable had a flake on the TLC with different colors that differed from saffron, confirming the falsification that was suspected in the visual inspection of the acquired samples. The main difference was the absence of the apocarotinoid crocin in the test specimens except for saffron.

**Conclusions:** The TLC method used allows us to identify the difference between authentic saffron and falsified products and can be used in pharmaceutical practices.

## PROSPECT FOR PHYTOCHEMICAL AND PHARMACOLOGICAL RESEARCH OF FIREWEED FERMENTED RAW MATERIALS

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**Introduction.** *Chamaenerion angustifolium* (Ch. *angustifolium*) or *Epilobium angustifolium*, known in North America as fireweed, in some parts of Canada as great willow herb, and in Britain as