

Submitted to 7<sup>th</sup> Joint meeting of AFERP, ASP, GA, PSE & SIF, Natural products with pharmaceutical, nutraceutical, cosmetic and agrochemical interest, August 3-8, 2008, Athens, GREECE.

## Geographical origin of Saffron spice by Mid-Infrared Spectroscopy (MIR)

*E.G. Anastasakj, C.D. Kanakis, C.S. Pappas, P.A. Tarantilis, M.G. Polissiou\**  
*Labotatory of Chemistry, Agricultural University of Athens, 75 Iera Odos Street, 118 55 Athens, Greece*

Saffron is the commercial name for the dried stigmas of *Crocus sativus* L. flower. The main saffron producing countries are Greece, Spain, Italy and Iran. The price of this spice strongly depends on its country of origin. For this reason the geographical origin discrimination is crucial.

Near-Infrared (NIR) Spectroscopy has been reported in the literature [1] for the geographical discrimination of saffron. However, due to the fact that NIR absorptions reflect overtones and combination bands of fundamental transitions, NIR spectra are much less distinct than Mid-Infrared (MIR) spectra. MIR absorption bands are generally well resolved and can be related to defined vibrational transitions [2].

Sixty six saffron samples from the four main saffron producing counties were used. Each sample was extracted by diethyl ether using ultrasound. The extracts were concentrated under vacuum.

MIR spectra were obtained using ZnSe crystal windows on a Nicolet 6700 Fourier Transform Infrared (FT-IR) spectrometer. Concentrated sample was placed on a ZnSe disk, air-dried and its spectrum was collected. A library was created using the average spectra of each country of the above samples by the use of the OMNIC software (ver. 7.3).

Using the above software, the unknown spectra were compared with the spectra from the created library in the spectroscopic region 1800-900 cm<sup>-1</sup>. Then, the similarity was calculated by software automatically. A similarity value of 100, indicates a perfect match. The closer the value is to 100, the better the match. The unknown samples have better similarity value with the average spectrum of their geographical origin.

### References

1. Zalacain, A. et al. (2005) J. Agric. Food Chem. 53:9337-9341.
2. Tarantilis, P.A. et al. (2008) Food Chemistry accepted manuscript doi : 10.1016/j.foodchem.2008.03.020