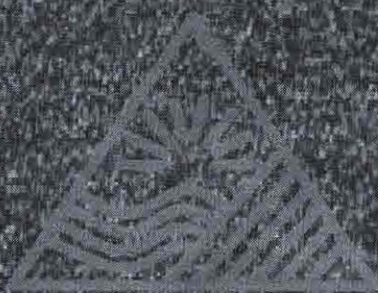


35th INTERNATIONAL SYMPOSIUM
on
ENVIRONMENTAL ANALYTICAL CHEMISTRY
BOOK OF ABSTRACTS



GDAŃSK, 22-26 June 2008

ANALYSIS OF FLAVONOIDS FROM KIWI FRUITS BY LIQUID CHROMATOGRAPHY COUPLED WITH DIODE-ARRAY DETECTOR AND ELECTROSPRAY MASS SPECTROMETRY

Sheła GORINSTEIN², Jacek NAMIEŚNIK¹, Andrzej WASIK¹

¹Department of Analytical Chemistry, Chemical Faculty, Gdańsk University of Technology, Narutowicz 11/12, 80-952 Gdańsk, Poland; ²Department of Medicinal Chemistry, School of Pharmacy The Hebrew University-Hadassah Medical School, P.O.B. 12065, Jerusalem 91120, Israel

The flavonoids are among the most widely occurring groups of plant secondary metabolites and one of the most diverse groups both structurally and functionally.

Flavonoids are polyphenolic compounds with antioxidant properties [1] and several studies have shown that a high intake of flavonoids is correlated to a decrease in heart disease, and other biological effects of this class of compounds have been described in several *in vivo* and *in vitro* studies [2,3].

Mass spectrometry (MS) is among the powerful techniques for the elucidation of flavonoids structure. During the past decade, electrospray ionisation (ESI) MS has emerged as a highly useful methodology for direct coupling with liquid phase separation techniques such as chromatography and electrophoresis [4]. The utility of high performance liquid chromatography (HPLC) separations was greatly enhanced by mass spectrometric detection, which allowed the confidently identification of the substances in plant materials. Liquid chromatography coupled to mass spectrometry (LC/MS) can give information on sugar and acyl moieties in flavonoids which not revealed by the UV spectrum without the need to isolate and hydrolyse the compounds [5].

A high-performance liquid chromatography (HPLC) method with photo-diode array (DAD) detection and mass spectrometry (MS) was developed to separate and quantify flavonoids in cabbage leaves and kiwi.

This method is based on the separation of flavonoid glycosides present in the methanolic extracts from fruits using high performance liquid chromatography (HPLC) followed by detection with electrospray ionization mass spectrometry (ESI/MS). Chromatographic separation of the analytes of interest was achieved on a LiChroCART C-18 250x4 column with detection in negative ion mode. Calibration graphs were obtained by determining the area between external standard of each major compound. Analyses were performed with a HP1100 LC from Agilent, equipped with an automatic injector. MS was performed using a VL quadrupole mass spectrometer (Agilent) equipped with electrospray ionization (ESI) ion source (nitrogen flow rate 10 L/min). Mobile phases consisted of 0.25% formic acid in water (A) and 0.25% formic acid in methanol (B). Separation was carried out under the following conditions: gradients starting at 5% B to 100% B in 55 min. The column was equilibrated for 10 min prior to each analysis. Flow rate was 1.0 mL/min and injection volume was 50 µL. Drying nitrogen was heated to 300°C. Peaks were identified on the basis of comparison of retention times, UV-VIS, and MS spectra with standards.

References:

- [1]. Rice-Evans C.A., Miller N.J., Panaga G., Trends Plant Sci., Volume: 2, (1997), pp. 152-159
- [2]. Rice-Evans C.A., Miller N.J., Panaga G., Free Rad. Biol. Med., Volume: 20, (1996), pp. 933-956
- [3]. Lien E.J., Ren S., Bui H., Wang R., Free Rad. Biol. Med., Volume: 26, (1999), pp. 285-294
- [4]. Niessen W.M.A., Tinke A.P., J. Chromatogr. A, Volume: 703, (1995), pp. 37-57
- [5]. Stobiecki M., Phytochemistry, Volume: 54, (2000), pp. 237-256