Simultaneous determination of p-coumaric acid and naringenin in honey using dispersive liquid-liquid microextraction and high performance liquid chromatography

Korbkarn Khukitirat¹, Pongsak Lownmunkong¹, Somyote Sutthivaiyakit², Pakawadee Sutthivaiyakit¹*

¹Department of Chemistry and Center of Excellence for Innovation in Chemistry, Faculty of Science, Kasetsart University, Bangkhen, Bangkok 10900, Thailand
²Department of Chemistry and Center of Excellence for Innovation in Chemistry, Faculty of Science, Ramkhamhaeng University, Bangkok 10240, Thailand
*E-mail: fscipws@ku.ac.th

Abstract: p-Coumaric acid and naringenin have anti-inflammatory and antioxidant benefits. However, they have not been determined in honey from Thailand. A simple, rapid and sensitive dispersive liquid-liquid microextraction (DLLME) followed by HPLC with diode array detection was developed for simultaneous determination of the two compounds. Some important parameters for DLLME were optimized. A mixture of acetonitrile (disperser solvent) and dichloromethane (extraction solvent) was rapidly injected to a sample solution in ammonium acetate (pH=3) by a syringe, thereby forming a cloudy solution. After centrifugation at 4°C, the enriched analytes in the sedimented phase were filtered prior to injection. The separation was performed on a Pursuit® XRS Diphenyl column (150 x 3.0 mm, 3 µm) at 40°C with 0.1% formic acid – methanol gradient as the mobile phase. The detection wavelengths were 291 nm and 311 nm for naringenin and p-coumaric acid, respectively. The flow rate was 0.3 mL min⁻¹. Due to the lack of matrix blank, standard addition was performed in the method development. The lychee honey sample was found to contain 5.50±0.70 µg·g⁻¹ and 4.86±0.55 µg·g⁻¹ for p-coumaric acid and naringenin respectively.

Keywords: Dispersive liquid-liquid microextraction; p-Coumaric acid; Naringenin; Honey from Thailand