

Abstract

This work deals with the development and basic validation of a method for determination of sucrose, glucose and fructose content in floral nectar. It uses capillary zone electrophoresis with contactless conductivity detection.

The theoretical part describes the functions of carbohydrates in nectar, principles of capillary zone electrophoresis and contactless conductivity detection. There is also a brief overview of applications in the determination of carbohydrates.

In the experimental part, sample injection at the short and at the long end of capillary were tested. In further experiments, the background electrolyte was optimized. The tested concentrations of NaOH were from 10 to 50 mmol l⁻¹. Optimal conditions for the experiments were injection at the short end of the capillary, 40mmol l⁻¹ NaOH as background electrolyte and separation voltage of 15 kV. Then, the repeatability, limit of detection and quantification and recovery of the method with a real sample of nectar were verified. Lactose was used as an internal standard. Relative standard deviation was below 2 %. Limits of detection were below 0.003 mg ml⁻¹ and limits of quantification were below 0.009 mg ml⁻¹. Recovery of the method was 97–105 %. Furthermore, the calibration dependences were measured, from which the concentration of carbohydrates in the sample was determined. The original sample contained 1.204 ± 0.011 mg (n = 3, 0.1 %) of sucrose, 0.341 ± 0.009 mg (n = 3, 0.08 %) of glucose and 0.358 ± 0.008 mg (n = 3, 0.07 %) fructose.

Key words

Capillary electrophoresis, contactless conductivity detection, carbohydrates