Photochemically induced fluorescence coupled to second-order multivariate calibration as analytical tool for determining imidacloprid in honeybees

Jeria, Yanara

Bazaes, Aliosha

Báez, María E.

Espinoza, Jeannette

Martínez, Jessica

Fuentes, Edwar

© 2016 Elsevier B.V.This paper presents a method for the determination of imidacloprid in honeybees based on the measurement of excitation-emission spectra of photo-induced fluorescence (PIF-EEMs) associated to unfolded partial least squares coupled to residual bilinearization (U-PLS/RBL) algorithm. As a preliminary step, matrix solid phase dispersion (MSPD) using C18 as dispersant, combined on-line with a solid phase extraction (SPE) clean-up on graphitized carbon-amino propyl silica phase was applied to diminish the interferences presents in samples. A previous study on the photochemical induction of fluorescence of imidacloprid in presence of bee matrix was included. The second order advantage achieved with RBL permitted the determination of imidacloprid in the presence of interferences present in samples (unexpected compounds of bees), which also shows photo-induced or native fluorescence. The LOD was 20 µg kg?1 (2.5 ng per bee; four bees treated), which is suitable for detecting i