Effectiveness of different cleanup sorbents for the determination of avermectins in fish by liquid chromatography tandem mass spectrometry.

ABSTRACT

An effectiveness and comparative study of cleanup sorbents used in dispersive solid phase extraction (DSPE) for the determination of avermectins, including emamectin (EMA), abamectin (ABA), doramectin (DOR), moxidectin (MOX), and ivermectin (IVE), was performed. Three different types of cleanup sorbents, alumina (Al), primary and secondary amine (PSA) and octadecyl (C18), were used to remove the matrix interference in fish samples. Homogenised fish samples were extracted with acetonitrile, magnesium sulphate anhydrous and sodium chloride. The cleanup sorbents were separately applied to the supernatant during the DSPE procedure; the mixtures were shaken and centrifuged, and the supernatant was dried. The extracts were reconstituted with acetonitrile/water and quantified by liquid chromatography tandem mass spectrometry with electrospray ionisation in the positive mode with two product ions that were monitored by selected reaction monitoring. The performance of each cleanup sorbent was observed for its accuracy and precision in a spiked blank sample at a concentration of 5 μg kg−1. The combination of the cleanup sorbents PSA and C18 was found to be the most effective in the cleanup of the fish samples. In the validation tests, the detection limit was in the range of 0.3 μg kg−1 to 0.4 μg kg−1, and the quantitation limit for all avermectins was 1 μg kg−1 in the linearity range of 1–15 μg kg−1. The recoveries of avermectins were 91.9–102.5%, with a relative standard deviation lower than 19%.

Keyword: Determination of avermectins; Fish; Liquid chromatography-tandem mass spectrometry.