Effect of a different mobile phase on LC–ESI–MS/MS performance for the identification and quantitation of polar and nonpolar heterocyclic amines in cooked chicken

ABSTRACT

An accurate and sensitive liquid chromatography-electrospray ionisation/multi stage mass spectrometry (LC–ESI–MS/MS) method has been developed for the characterization and quantitation of nine heterocyclic amine (HCA) compounds. We were identified 2-Amino-3-methyl-3H-imidazo[4,5-F]quinoline (IQ), 2-Amino-3-methyl-3H-imidazo[4,5-f]quinoxaline (IQx), 2-Amino-3,4-dimethyl-3H-imidazo[4,5-f]quinoline (MeIQ), 2-Amino-3,8-dimethylimidazo[4,5-f]quinoxaline (MeIQx), 2-Amino-3,7,8-trimethyl-3H-imidazo[4,5-f]quinoxaline (7,8-DiMeIQx), 2-Amino-1-methyl-6-phenylimidazo[4,5-b]pyridine as polar molecules, and they were eluted accordingly at the beginning of the analysis. However, Norharman, Harman and AαC were identified as a non-polar molecules and were eluted last. The excellent selectivity and sensitivity achieved by the selected reaction monitoring mode permitted satisfactory quantitation and confirmation of the injected HCA compounds with limit of detection and quantitation ranges from 0.17 to 1.44 pg and 0.53 to 4.57 pg, respectively. The recoveries ranged from 74 to 108%, with an interday and intraday precision of 1.6–1.9% and 0.1–0.9%, respectively. The method was successfully applied to identify and quantify the studied HCAs in fried and grilled chicken.

Keyword: Heterocyclic amines; LC–ESI–MS; MS; Method performance; Method validation; Fried and grilled chicken; Carcinogenic compounds