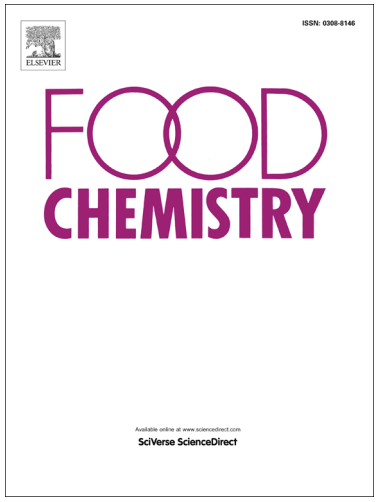

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Development and comparative analysis of single-drop and solid-phase microextraction techniques in the residual determination of 2-phenoxyethanol in fish

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Abstract

Solid-phase microextraction (SPME) and single-drop microextraction (SDME) in headspace mode, were used in the residual determination of the anesthetic 2-phenoxyethanol in fish fillets, to ensure food safety. For the optimization of the methodologies the experimental central composite design (CCD) was used, resulting in accurate evaluations with less amount of analysis. The developed methodologies presented good precision in the evaluated range, o limits of detection (LD) and quantification (LQ) for SDME were 0.2 and 0.62 μg mL^{-1} and for SPME were 0.18 and 0.56 μg mL^{-1}, respectively. In the analyzed samples the determined elimination time of post-anesthesia 2-phenoxyethanol was 12 h for the SDME and 24 h for the SPME, at the anesthesia concentrations evaluated (450 – 1050 μg mL^{-1}). The two techniques presented viability of application for the residual determination of 2-phenoxyethanol in fish, SPME being more sensitive and automated and SDME with lower operation cost.

Keywords: residual analysis, aquaculture, sample preparation, food safety

1. Introduction

Anesthetics are pharmacological compounds often used in fish farming to facilitate management and reduce fish stress (Ross & Ross, 2008). Among anesthetics, 2-phenoxyethanol is one of the most commonly used because it has safe margins of administration and provides lower mortality of animals (Coyle, Durborrow & Tidwell, 2004; Toni et al., 2015). However, these compounds can be accumulated in the fish organism for a certain time, making it