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Multiclass Analysis of Pharmaceuticals in Fish and Shrimp Tissues by High-Performance Liquid Chromatography-Tandem Mass Spectrometry

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Abstract : An efficient, reliable, and sensitive multiclass analytical method has been expanded to simultaneously determine 15 human pharmaceutical residues in fish and shrimp tissue samples by ultra-high-performance liquid chromatography-tandem mass spectrometry. The investigated compounds comprise ten classes, namely analgesic, antibacterial, anticonvulsant, cardiovascular, fluoroquinolones, macrolides, nonsteroidal anti-inflammatory, penicillins, stimulant, and sulfonamide. A simple liquid extraction procedure based on 0.1% formic acid in methanol was developed. Chromatographic conditions were optimized, and mobile phase namely 0.1 % ammonium acetate (A), and acetonitrile (B): 0 – 2 min, 15% B; 2 – 5 min, linear to 95% B; 5 – 10 min, 95% B; and 10 – 12 min was obtained. Limits of detection and quantification ranged from 0.017 to 1.371 µg/kg and 0.051 to 4.113 µg/kg, respectively. Finally, amoxicillin, azithromycin, caffeine, carbamazepine, ciprofloxacin, clarithromycin, diclofenac, erythromycin, furosemide, ibuprofen, ketoprofen, naproxen, sulfamethoxazole, tetracycline, and triclosan were quantifiable in fish and shrimp samples.

Keywords : fish, liquid chromatography, mass spectrometry, pharmaceuticals, shrimp, solid-phase extraction
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