

## Applications - Food analysis

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**Title:** A RAPID ULTRASOUND-ASSISTED DISPERSIVE LIQUID-LIQUID MICROEXTRACTION FOLLOWED BY LIQUID CHROMATOGRAPHY COUPLED TO A MASS SPECTROMETRY FOR DETERMINATION OF ARTEMISININ IN TILAPIA MUSCLE

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### Abstract body

Intensive aquaculture represents stressful conditions for fish and can trigger diseases that negatively affect their performance and survival. Fish production requires greater control, with improved health conditions and food quality, concerned with consuming products free of therapeutic products and synthetic chemicals. The use of active ingredients extracted from plants is an alternative to improve the immune system of these animals, reducing problems with stress and the emergence of diseases. Artemisinin (ART), isolated from the *Artemisia annua* plant, is a promising and potent antimalarial drug that meets the challenge of resistant parasites. ART, an endoperoxide containing sesquiterpene lactone, is the main component responsible for the therapeutic effect. In aquaculture, herbal medicines have recently appeared in the framework of complementary and alternative medicines, because they have relatively lower cost and safety. However, careful may be taken with the application method considering environmental issues, since the administration directly in water causes an accelerated decomposition of compounds,

restricting the additional use of the herbal medicine. Thinking of oral administration, many of these compounds are not completely metabolized by the animal's organism, being eliminated in urine and feces. These residues can accumulate in the soil, undergo leaching, transported to the water sources and contaminate the aquatic compartment. In addition, these compounds may accumulate in medicated fish tissues for the purpose of preventing or treating infections, leading to problems in the consumption of these foods. Therefore, to evaluate the accumulation of residues in fish, an analytical method based on high performance liquid chromatography coupled to ion trap mass spectrometry (LC-MS/MS) was developed to quantify ART in tilapia muscles (*Oreochromis niloticus*). For sample preparation, 1 g of fish and 5 mL of disperser extractor acetonitrile were placed in tubes and vortexed for 1 minute. Then, 2 g of magnesium sulfate and 50 mg of C18 were added for lipid removal and again stirred in the vortex for 1 minute. The tubes were centrifuged at 3000 x g for 5 minutes. For ultrasound-assisted dispersive liquid-liquid microextraction (UA-DLLME), 2 mL of the supernatant were transferred to centrifuge tubes, 2 mL of Milli-Q water was added and 250 µL of toluene, for three times, was added, with a micro syringe. The tubes were left on ultrasound for 1 minute and centrifuged at 3,000 x g for 5 minutes. The supernatant was removed and dried with nitrogen, resuspended in 250 µL of mobile phase, filtered with 0.22 µm nylon filters and injected for LC-MS/MS analysis. The mobile phase, composed of ammonium acetate 10 mmol L-1:acetonitrile, 50:50 (v/v) was used. The proposed method was validated and successfully applied in pharmacokinetics studies. Capes and BNDES (Proc. N°0117020010308).