

7-pentoxyresorufin-*O*-depentilase and 7-benzyloxyresorufin-*O*-debenzylase as potential biomarkers of exposure to 17 β -estradiol in Nile tilapia.

¹Franciele Bitencourt, ²Rosa T. S. Frighetto, ²Júlio F. Queiroz, ²Marcos E. Losekann, ²Alfredo J.B. Luiz, ¹Eduardo Alves de Almeida*.

¹Departamento de Química e Ciências Ambientais, IBILCE, UNESP, Av. Cristóvão Colombo 2265, CEP 15054-000, São José do Rio Preto, SP, Brasil.

²EMBRAPA Meio Ambiente, Rodovia SP 340 - Km 127,5 Caixa Postal 69, Jaguariúna - SP - Brasil - CEP: 13820-000.

*Corresponding author: E-mail: ealmeida@ibilce.unesp.br; Phone: ++ 55 17 3221-2508; FAX: ++ 55 17 3221-2356.

Abstract

Several estrogenic compounds have been detected in sewage treatment plants, surface water, groundwater and drinking water in several countries. These compounds can cause serious physiological disturbances in aquatic organisms at very low concentration, thus the development of sensitive biomarkers to diagnose impacted areas are needed. Considering that most hormones are metabolized by different cytochrome P450 isoforms in fishes, in this work we were interested to evaluate how some of these isoforms respond to low concentrations of 17 β -estradiol (5 and 15 μ g/L) for 7 days, by measuring the activities of 7-ethoxyresorufin-*O*-deethylase (EROD), 7-benzyloxyresorufin-*O*-debenzylase (BROD) and 7-penthoxyresorufin-*O*-deethylase (PROD). GST activity was measured as well. EROD and GST activities were unchanged. PROD activity was ~ 6-fold increased in animals exposed to 15 μ g/L of the hormone, while BROD was ~ 4-fold increased after 7 exposure days to 5 and 15 μ g/L, which indicate these enzymes as potential new biomarkers for the presence of 17 β -estradiol at very low concentrations in the aquatic environment.

Keywords: 7-ethoxyresorufin-*O*-deethylase, 7-benzyloxyresorufin-*O*-debenzylase, 7-penthoxyresorufin-*O*-deethylase, 17 β -estradiol, biomarker, tilapia.