

Gene expression pattern in different tissues of mudskipper (*Boleophthalmus dussumieri*) in normal and benzo(a)pyrene (BaP) exposure condition

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Received date: 2020/06/19
Reception date: 2020/08/20

Abstract

CYP1A gene plays a critical role in main involved enzymes in the xenobiotic metabolism. We conducted an experiment to evaluate the CYP1A gene expression in normal or in benzo(a)pyrene (BaP) exposure condition. Healthy mudskippers (*Boleophthalmus dussumieri*), were sampled from Shif shores in Boushehr city, IRAN. Then we measured the mRNA expression of CYP1A gene in different tissues by RT-PCR method. RT-PCR analysis revealed that liver organ had the maximum gene expression and in kidney, gill, heart, brain, and intestine tissue showed different CYP1A gene expression from 49, 46, 40, 35, 11, and 10% in normal condition respectively. To study the physiological responses of organs, 25 µg/g Bw of Bap was administered to the fish and CYP1A gene expression changes were followed to 24 h after injection. The results showed that CYP1A gene expression were increased extremely and reached 84.4 and 83.2 fold higher than normal condition in kidney and liver respectively. According to the results, liver organ showed the highest response of CYP1A gene expression like other fish species. But, CYP1A gene expression in other organs was higher in comparison with liver organ. The basal expression pattern of genes depends on the species. High level of CYP1A gene expression in this study is due to PAH exposure of mudskipper in natural conditions. In total, the basic expression of the CYP1A gene depends on the species and the ecological conditions of the species. The results showed that the liver was main organ, and other organs (kidneys, intestines, and gills) play an important role in xenobiotic metabolism. The results showed that most changes in gene expression occur in kidney, intestine and gill, so CYP1A gene expression changes in in these tissues could be used as a biomarker.

Keywords: biomarker, *Boleophthalmus dussumieri*, CYP1A gene, Gene expression, mudskipper.