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SEZONSKI ZAVISNA EKSPRESIJA CYP1A U
HEPATOPANKREASU OSLIC: A I TRLJE
NA USC: U REK-E BOJANE

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Rezime :

U cilju utvrdivanja efekata zagadivaca sredine na akvaticne ekosisteme, koriste se razliciti biomarkeri. U dosadasnjim istrazivanjima se pokazalo da enzimi faze I biotransformacije, a posebno CYP1A, pripadaju najosetljivijim biomarkerima kod riba. CYP1A je okarakterisan kao najbolji biomarker kod izlaganja riba ksenobiotičnim jedinjenjima. Relativna kolicina proteina CYP1A moze da se odredi imunoloskim metodama, koriscenjem mono- i polispecificna antitela, ELISA te st o m, Western-blot analizom i histoloskim tehnikama. Generalno je ustanovljena korelacija izmedu nivoa **IRNK**, relativne kolicine proteina i enzimatske aktivnosti CYP1A. U ovom radu je korisena metoda Western-blot analize i cilj je bio da se okarakterise prisustvo CYP1A u hepatopankreasu osli ca- *Merluccius merluccius* i trlje- *Mullus barbatus* u toku zime i proleca na uscu reke Bojane. Obe izucavane vrste su od komercijalnog znacaja. Dobijeni rezultati ukazuju na postojanje razlika u proteinskom profilu izmedu ove dve ispitivane vrste, dok unutar vrsta nisu konstatovane ni kvalitativne ni kvantitativne sezonski zavisne razlike. Western-blot analiza sa antitelom na CYP1A je pokazala da je ovaj enzim prisutan u veoma maloj kolicini u hepatopankreasu obe izucavane vrste tokom zime. Medutim, relativna kolicina CYP1A se uvecava kod obe ispitivane vrste u prolece. Indukcija

CYP1A, kao deo odbrambenog sistema riba, ukazuje na prisustvo zagadivaca u vodi i na njihov ekotoksikoloski potencijal. Ovi rezultati se mogu tumaciti kao rani signali upozorenja na stetne efekte zagadivaca. Povecan nivo CYP1A u prolece bi se moglo povezati sa pojacanim antropogenim uticajem na uscu reke Bojane tokom ovog ciklusa.

Key words: CYP1A, ribe, biomarker

SEASONAL DEPENDING EXPRESSION OF CYP1A IN THE
HEPATOPANCREAS OF *Merluccius merluccius* And *Mullus barbatus*
AT THE MOUTH OF THE RIVER BOJANA

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Abstract:

In order to assess effects of environmental pollutants on aquatic ecosystems, different biomarkers may be examined. The phase I biotransformation enzymes, notably CYP1A, definitely belong to the most sensitive fish biomarkers known at present. CYP1A is a well-established biomarker of exposure of fish to xenobiotic compounds. The CYP1A protein levels can be determined immunologically, using mono- or polyclonal antibodies with ELISA, Western-blotting or histochemical techniques. Generally, a good correlation is observed between CYP1A mRNA, protein levels and CYP1A activity. In this work we performed Western-blot analysis and our aim was to characterize the induction of CYP1A in the hepatopancreas of the European hake-*Merluccius merluccius* and Red mullet-*Mullus barbatus* and in winter and spring at the mouth of the river Bojana. Both species are of considerable commercial importance. Whereas interspecies differences in protein profiles were established, no qualitative or quantitative intraspecies or seasonal variations in protein profiles were observed. Western blot analysis with a polyclonal antibody to CYP1A revealed the CYP1A expression in both examined fish species in winter at the very low level. However, the relative concentrations of CYP1A were increased in spring. The apparent initiation of the defense response in fish suggests that the contaminants present in seawater have an ecotoxicological potential. These findings could be interpreted as an early-warning signal for the deleterious effects of the pollutants. The higher level of CYP1A in spring could be connected with increased antiprogenic activity at the mouth of the river Bojana in this part of the year.

Key words: CYP1A, fish, biomarker

