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Subcellular distribution of some purine catabolism enzymes in brown trout (*Salmo trutta*) liver

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Abstract

Background: Subcellular location of purine catabolism enzymes is of great interest in comparative studies due to the significant variability among species [1]. This metabolic pathway reflects in large extent a phylogenetic evolution with the loss of several enzymes in certain species, resulting in differences in the end products that are excreted [2]. Particularly in fishes, some of those enzymes are described as cytosolic for some species and as peroxisomal for others. In relation to purine catabolism enzymes in brown trout liver, published data points that urate oxidase is a peroxisomal enzyme, consistent with findings in other vertebrates [1,2]. **Objective:** This study aims to identify the subcellular location of some purine catabolism enzymes in crude cell fractions of brown trout liver. **Methods:** A centrifugal fractionation technique was applied to obtain crude cell fractions, followed by spectrophotometric measurement of enzyme activities. Assays included xanthine oxidase/xanthine dehydrogenase, allantoinase, and allantoicase, alongside organelle marker enzymes, such as succinate dehydrogenase (mitochondria), arylsulphatase (lysosomes), catalase and D-aminoacid oxidase (peroxisomes) and NADPH cytochrome c reductase (microsomes). **Results:** Xanthine oxidase and allantoicase activities were undetectable in brown trout liver fractions. This observation is consistent with the notion that certain organisms possess the xanthine oxidoreductase enzyme primarily in the xanthine dehydrogenase form or exclusively in this form. Over 85% of xanthine dehydrogenase and allantoinase activities were recovered in the supernatant fraction. **Conclusions:** The paucity of organelle marker enzymes in the cytosolic fraction of brown trout liver suggests that both xanthine dehydrogenase and allantoinase are cytosolic enzymes, with high recovered activities in the supernatant fraction. The absence of allantoicase activity in brown trout supports allantoic acid as the final purine catabolism product in salmonids [2].

Keywords: xanthine oxidase; allantoinase; allantoicase

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