A COMPARATIVE STUDY ON THE ACTIVITY OF ALANIN-AMINOTRANSFERASE IN *HYPOPHTHALMICHTHYS MOLITRIX* AND *ARISTICHTHYS NOBILIS*

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Key words: *Aristichthys nobilis*, *Hypophthalmichthys molitrix*, alanin-aminotransferase

Abstract: The present paper represents a comparative study on the activity of one aminotransferase - alanin-aminotransferase, in the digestive tube of *Hypophthalmichthys molitrix* (silver carp) and *Aristichthys nobilis* (bighead carp). The enzymatic activity has been determined colorimetrically, with 2, 4 - dinitrophenyl hydrazine, the results obtained being expressed as UE / g / min. It was observed that, comparatively with the alanin-aminotransferase activity recorded in silver carp, in the case of bighead carp, the values recorded are much lower.

INTRODUCTION

In the reactions of fish adaptation to conditions of controlled intensive growth, a special part is played by the gastro-intestinal tractus and by its enzymes, known as assuring the digestion of food. The activity of the digestive enzymes reflects, to a considerable extent, the alimentary behavior of fish, known as capable of adapting themselves to the modification of the alimentary regime within non-stressing limits, which is of special importance in the intensive growing of such organisms (ARTENIE, 1990; ARTENIE *et al*., 1995).

The data provided by the literature of the field indicate a striking dynamics of the alanin-aminotransferase as a function of tissue, category of age and season selected for investigation. In this respect, some researches have evidenced the existence of a positive correlation between the activity of alanin-aminotransferase and tissues' growing intensity, the enzymatic activity being more intense in the early stages of individual development, which may be explained by the intense growing rhythm of the period, based on an intense proteic synthesis (proteic anabolism) (MĂRGĂRINT *et al*., 1980; MISĂILĂ *et al*., 1990).

The authors' own investigations have been devoted to the activity of intestinal alanin-aminotransferase, followed in two culture, 2 year-old cyprinids species, namely bighead carp (*Aristichthys nobilis*) and silver carp (*Hypophthalmichthys molitrix*) from the Ezăreni accumulation (the district of Jassy).

MATERIALS AND METHOD

For the experiments, samples have been collected from the median region of the digestive tube (between the esophagus and the duodenum) from 20, two year-old individuals belonging to the *Aristichthys nobilis* (bighead cap) and *Hypophthalmichthys molitrix* (silver carp) species.

For each individual in part, the intestinal content has been removed through scraping, three parallel dosings being made each time, the data presented representing the average value of these repetitions.

The activity of alanin-aminotransferase has been determined colorimetrically, with 2, 4 - dinitrophenyl hydrazine, the results obtained being expressed as UE / g / min. (COJOCARU, 2005).

RESULTS AND DISSCUSION

The experimental data obtained from the determination of alanin-aminotransferase activity in the silver carp have evidenced a quite ample variation of the enzymatic activity from one individual to another, the minimum value recorded being of 0.958 - 1.016 UE / g / min., while, in the next ones, the values recorded were between 0.361 - 0.641 UE / g / min. (Fig. 1).

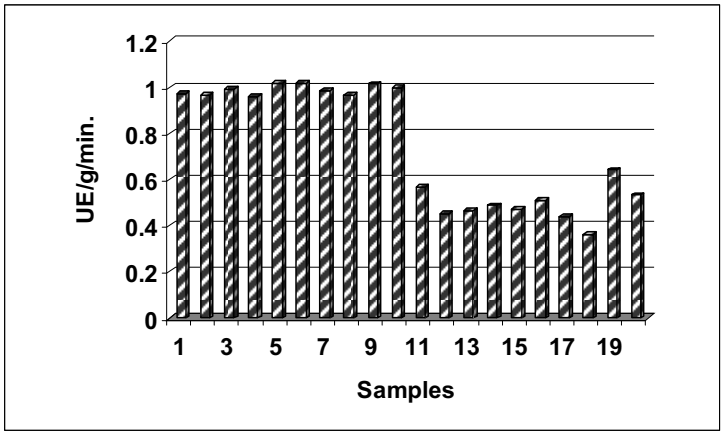

Fig.1. Activity of intestinal alanin-aminotransferase at *Hypophthalmichthys molitrix*

Utilization of the average values of the standard deviation permitted calculation of the inferior and superior limit of the confidence intervals, on the basis of the critical value t (α, n-1) given by α = 0.05 and n-1 degrees of freedom - i.e., with a probability of 95%.

As shown in Figure 2, the confidence intervals of the enzymatic activity take vary narrow values for all individuals taken into study.

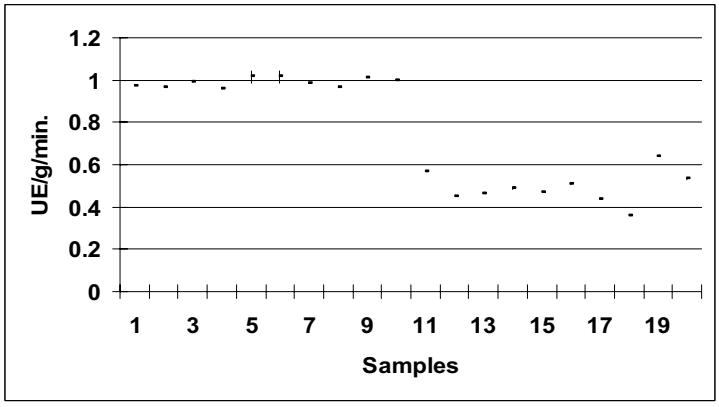

Fig.2. Confidence intervals of intestinal alanin-aminotransferase at *Hypophthalmichthys molitrix*

In the bighead carp, the activity of alanin-aminotransferase in the digestive tube evidences quite pronounced inter-individual variations. Thus, if the maximum value recorded in individual 1 is of 0.763 UE / g / min., while the minimum one is of 0.172 UE / g / min., in most of the other ones, the enzyme records an average value situated in the 0.342 - 0.461 UE / g / min.

However, comparatively with the enzymatic activity recorded in silver carp, in the case of bighead carp, the values recorded are much lower (Fig. 3).

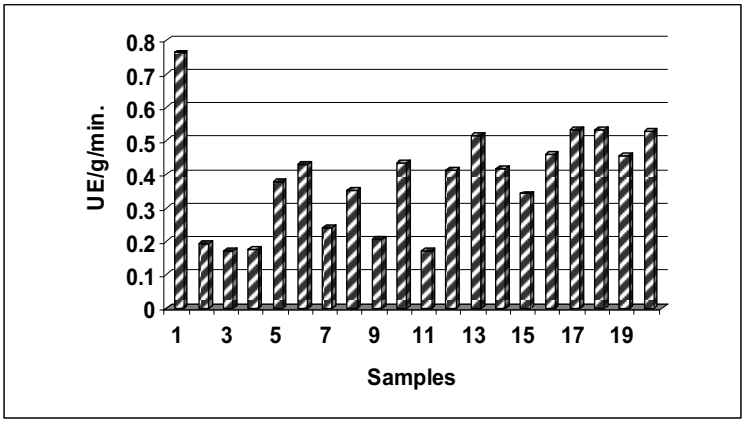

Fig.3. Activity of intestinal alanin-aminotransferase
at *Aristichthys nobilis*

Analysis of the graph plotting the limits of the confidence intervals of alanin-aminotransferase' s activity evidences extremely narrow intervals, the only exception being individual 19, in which the limits of the interval had been somehow larger (0.426 - 0.483 UE / g / min.), which evidences that the results obtained have a very low degree of error (Fig. 4).

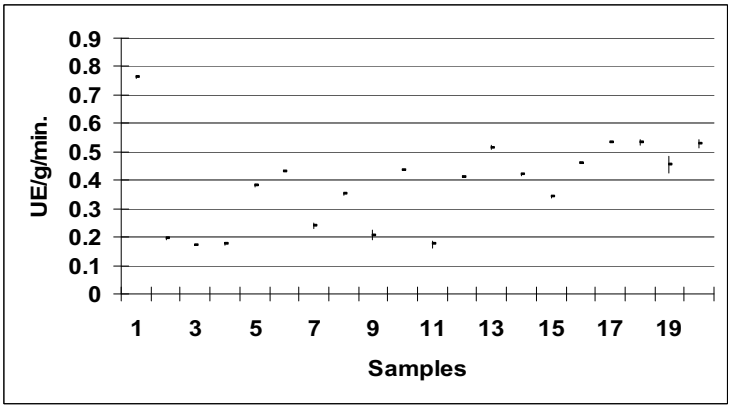

Fig.4. Confidence intervals of intestinal alanin-aminotransferase
at *Aristichthys nobilis*

In order to check the possible differences or similarities occurring between the activity of alanin-aminotransferase from the digestive tube in the two species under study, the Anova test - the unifactorial model, with an equal number of observations in the cell, has been applied (FOWLER *et al*., 2000); also, a comparative graphical representation of the enzymatic activity has been drawn (Fig. 5).

Starting from the experimental results obtained, the null (H_0) and the alternative (H_1) hypothesis of the test have been formulated.

As the calculated value of the factor (27.182) is much higher comparatively with the critical value (4.098), the null hypothesis is to be rejected and the alternative one is accepted,

which may lead to the conclusion that the alanin-aminotransferase activity records significant differences between the two species.

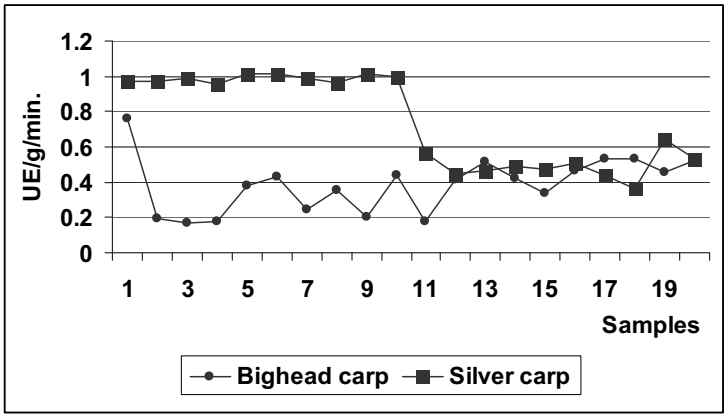

Fig.5. Alanin-aminotransferase activity in *Aristichthys nobilis* and *Hypophtalmichthys molitrix*

CONCLUSIONS

The experimental data obtained for alanin-aminotransferase, in *Hypophthalmichthys molitrix*, evidence a quite ample variation of the enzymatic activity from one individual to another. The minimum value recorded is of 0.361 UE / g / min., while the maximum one - 1.016 UE / g / min. In *Aristichthys nobilis*, the activity of alanin-aminotransferase follows the same curve, the maximum value recorded in individual 1 being of 0.763 UE / g / min., while the minimum one was of 0.172 UE / g / min.; in most of the other individuals, the enzyme evidenced an average value, situated in the 0.342 - 0.461 UE / g / min. range.

The limits of the confidence intervals of alanin-aminotransferase activity in the digestive tube are extremely reduced, for both species under study.

A comparison between the calculated and the critical values of the factors evidenced considerable differences between the activity of alanin-aminotransferase in the digestive tube between the two species of culture cyprinids.

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