

In animal husbandry the domestication process brings many benefits, including the availability of products of animal origin throughout the year. In the case of fish the border between domesticated and non-domesticated species can not be determined clearly. However, it is known that farmed fish grow faster and have lower response to stress. Yet, some features that are evident in the domestication process and considered as value in culture conditions, from the sustainable aquaculture (restitution and restocking) point of view could be highly undesirable (like for example: the loss of part of the genetic variation and changes in behavior). It is alarming and adverse because, in most cases, restocking operations based on the fry produced by the spawning of farmed fish stocks. Therefore, identification of features resulting from the domestication process of different fish species is important, both for the aquaculture and ecology and also for continuity of the population in their natural environment.

To date number of information about domestication process and its effects in fish is very limited. It is not known, which particular traits observed during the research on finfishes larviculture are resulting from the domestication and which are the effect of the adaptation capabilities of species stemming from its biological properties. Conducted studies suggest that only a few features such as for example length or sensitivity to stress, vary with the level of domestication of fish.

The aim of the project is to verify whether the level of domestication in perch (*Perca fluviatilis* L.) larvae affect the biological traits, gene expression profile and/or kinetics of activity of digestive enzymes. In this way, efforts will be undertaken aiming at indication of potential biomarkers of the domestication level in this species.

Realization of the project will allow to verify the following two hypotheses: (1) domestication level has an impact on disclosure of biological traits, gene expression profile and activity of digestive enzymes during larval development; (2) the general adaptability to the controlled conditions of perch larvae on higher level of domestication is better than those on lower level of domestication.

Aim of the project is to be achieved by carrying out precise biological, molecular and enzymatic analysis in perch larvae at different levels of domestication. The project will be divided into two 'working packages' (WP). During the first one, the larvae from wild spawners - W and the domesticated ones - D, will be reared (separately) according to standardized rearing protocols. This will allow to analyze revealing the biological traits, changes in the gene expression profile and the dynamics of the activity of digestive enzymes throughout the larval period. During the second WP the reaction of W and D perch larvae for selected "stressors" (rapid temperature change, too early weaning to dry feed and the weaning to dry feed with a reduced and standard protein content) will be examined. To achieve the goal of the second WP detailed analyzes of biological traits, changes in the gene expression profile and the dynamics of digestive enzymes activity, will be also carried out. Analysis of all these characteristics will determine whether, in fact, among them are those that show up depending on the level of domestication process in larvae.

In the literature, there are still no data about, how the process of domestication affect fish larvae. It is not known which analyzed features are the result of the domestication process, and which are merely the result of the adaptability of individuals. That is why all obtained data about the domestication of the fish larvae will have very valuable and innovative contribution, to still insufficiently known, the process of domestication of fish.

Innovative approach in planned project and to obtain reliable data, will be guaranteed by the application of modern scientific methods in conjunction with precise observations of larvae biology. Besides obtained data will be an important contribution to the literature on perch. A study of the impact of the domestication process on the larvae traits will be an entirely new element of biological knowledge, not only in perch, but also in other freshwater fish species, because such comprehensive analysis of larval development was never carried on.