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BREEDING AND EXPLOITATION OF NATIVE SALMONIDS SPECIES WITH A VIEW TO DIVERSITY THE FISH PRODUCTION AND PRESERVE THE BIODIVERSITY

CREŞTEREA ŞI EXPLOATAREA SPECIILOR DE SALMONIDE AUTOHTONE ÎN SCOPUL DIVERSIFICĂRII PRODUCȚIEI PISCICOLE ŞI A CONSERVĂRII BIODIVERSITĂȚII

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In Romania, the salmon breeding is the second branch of pisciculture as importance, but the obtained production is very small (about 1240 to; ANPA, 2005) and enough limited as bred species (brown trout - Salmo trutta fario, brook trout - Salvelinus fontinalis and rainbow trout - Oncorhynchus mykiss). The brown trout (Salmo trutta fario L.) and the huchen (Hucho hucho L.) represent two species with big economical, biological and culinary value, and to capitalize and promote the Romanian aquatic and endemic potential we consider timely and necessary that these ones to breed in specialized farms, with a view to diversity the fish production and to preserve the biodiversity. In the project, our consortium proposes projection and building of a pilot station for brown trout (Salmo trutta fario L.) and huchen (Hucho hucho L.) breeding in space and environment controlled, hall type, with control possibility of medium parameters. By application of modern and performed fish breeding system it can be promoted new methods, techniques and technologies, which have as final aim the obtaining of some diversity fish productions, and evidently superior given to those obtained in present days in trout farms from Romania.

Key words: brown trout, huchen**,** native salmonids, biodiversity

Introduction

The aspects bind to main ecological problems have today as result the specific spreading area modification for valuable fish species and number increasing or even some native or endemic species disappearance. The brown trout (*Salmo trutta fario*,L.) and the huchen (*Hucho hucho* L.) are the main native and endemic fish species, valuable, from Salmonidae family, which populate the cold

waters from Romania. The brown trout (*Salmo trutta fario,* L.) is part of fish category with special taste of meat, and in our country there is a single mountain trout species, present until glacial period since was adapted to sweet waters (Bud, 2007; Păsărin, 2007). The population and re-population actions of mountain and sub-mountain waters with embryonated roes, larvae, sapling or even salmonids' sires have as effect a non-controlled mixture of populations (Dombi, 2004), with substantial modifications in the new appeared phenotypes. In case of brown trout (*Salmo trutta fario,* L.), this one is adapted to the new biotope and became an ecological form (Walter, 1913; Schindler, 1953; Bauch, 1955; Seppovaara, 1962), thus as concerns the taxonomy exist confusions (Elliott, 1994; Kottelat, 1997), due to classification difficulties of numerous populations distinctive identified, both morphologically and genetically. Biodiversity is present both to genetic level (Vlaic, 2007), among individuals inside populations, and also among species or communities, and to realize the biodiversity preservation, the taxonomic units must be correctly identified.

Despite of considerable progress of researches in the last 20 years, as concerns the knowledge referring to *Hucho* genus, these ones are insufficient (Holcik, 1988), but it is sure the affiliation of this genus to Salmonidae family (Bud, 2007; Pasarin, 2007). The huchen is both important and efficient, in many zones being the unique biological improver of sub-mountain waters (Kulmatychi, 1931 a,b; Ivaska, 1951; Holcik, 1988). Despite of the fact that huchen specific spreading area is limited and the exemplars' number decreased substantially (Decei, 2001), its importance increased and is up to date (Holcik, 1988).

The studies show the bio-improved importance of huchen (Sventina, 1970) to combat the cyprinid invasive species. Besides importance in sport fishing (Bud, 2007) is evident also the culinary value of the huchen (Pasarin, 2007) and implicit the economical one (Papadopol, 1977). As concerns that, some authors (Kulmatychi, 1931 a, b) mentioned the fact that huchen breeding could compete with that of carp one (Holcik et al, 1988). The huchen breeding in specialized farms is practiced successfully in some European countries (Holcik et al, 1988) and the first breeding try is dated from the XIXth century (Slovakia, Czech, Austria etc.) (Bud, 2007). It is an endemic species of the Danube basin, spread in the most many affluent of the Danube (Banarescu, 1961; Papadopol, 1977), on our country territory (Bud, 2007), today can be found only on some water courses and in captivity conditions in some trout farms, where is succeeded the artificial reproduction (Bradisor, 2006, 2007, no published data) and maintenance in captivity conditions (trout farm Prejmer, no published data).

Materials and Methods

In Romania, the salmon breeding, as importance, is the second branch of the pisciculture, but the obtained production is very small (about 1240 t; ANPA, 2006) and enough limited as bred species (brown trout *Salmo trutta fario,* 80,770 t, salvelinus trout, *Salvelinus fontinalis*, 195,911 t and rainbow trout, *Oncorhynchus*

mykiss, 963,873 t)). The Romanian salmon farms practice more and more the hybrids' breeding proceeded from imported embryonated roes, and the interest for native biological material breeding, selection and improvement is practically non-existent (Boaru, 2005).

The brown trout (*Salmo trutta fario* L.) and the huchen (*Hucho hucho* L.) represent two species of great economical and culinary value, and for capitalization and promoting of aquatic and endemic potential of Romania, we consider that is opportune and necessary these ones to be bred in specialized farms in purpose to diversify the fish production.

The bind among the great demand of aquatic products, the costs of aquatic farm functioning, the impact on environment of aquaculture overflows and the desire to increase the production efficiency, continues to lead to promote technologies, methods, techniques and managerial practice (Lazur et al., 1997), and in all aquaculture systems it is important to provide medium parameters adequate for breeding and development of aquatic population (Losordo et al, 1998; Cristea et al., 2002). The most modern and performing fish breeding system is that practiced in halls, in closed spaces, with possibility of fish breeding in controlled environment conditions (Boaru et al, 2005; Voda et al, 2005). The breeding systems, with control of all medium parameters, used by researchers starting with 1960 (Tetzlaff et al, 1990) and in 1979 prof.dr. In-Bae Kim started the construction of a fish breeding system with control of medium parameters to level of a pilot station in the campus of National Fisheries University from Busan, after which this aquaculture system was used on a large scale in bio-productive aim.

In this paper, authors propose projection and building of specialized farms for breeding brown trout (*Salmo trutta fario* L.) and huchen (*Hucho hucho* L.) in space and environment controlled, hall type, with control possibility of medium parameters. By application of the modern and performed fish breeding system it can be promoted new methods, techniques and technologies, which have as final aim the obtaining of some diversity fish productions, and evidently superior given to those obtained in present days in trout farms from Romania.

Results and Discussions

Projection and building at this trout farming presume accomplishing following stages:

1. Obtaining of theoretical and material conditions, fact to presume, first of all, the effecting of hydro-geological studies (making the drillings from wells which provide water source);
2. Follows water samples' collecting and effecting of hydrological and hydro-biological analysis of water source, with debit determination and making of bulletin (dossier) of physical-chemical and biological analysis;
3. In the aim to arrange and prepare the space for breeding in basins (aquaria) of native salmonid species, will be realized a data basis with all data and

information concerning the fish breeding in basins (aquaria) placed in reduced spaces (closed);

4. Analyzed the results of bulletins of water hydro-geological, hydrological and hydro-biological;
5. Established the projection theme for envelope and basins, water supply, treatment and evacuation;
6. The done and edited the execution project of the trout farming
7. Realized trout farming (envelope, basins, water plug, supply installations, water recirculation/treatment/warming installations, water evacuation installations), making functional the trout farming and framing installation verification in projected parameters;
8. Acquisition of the biological material for basins' population from trout farming**,** specialized on species and ages categories.

Conclusions

The suitability of outing in practice of this specialized farm derives from the obtained results, and the novelty, originality and complexity refer to next aspects:

1. Breeding in hall, in basins and controlled medium supposes some solutions, methods, techniques and implicit new breeding and exploitation technologies' application for salmonids;
2. Salmonid arrangements' locating could not be more limited by the zones which provide environment conditions specific for salmon species;
3. If in European countries (Czech, Slovakia, Austria, Germany) the huchen (*Hucho hucho* L.) is bred intensively for fish consumption production, as well for sport fishing, in Romania the subject is new;
4. The trout farms from our country practice more and more the hybrids' breeding, proceeded from imported embryonated roes (with high breeding speed), and the interest for native biological material breeding, selection and improvement is practically no existent;
5. The gustative qualities, the culinary and biological value of brown trout (*Salmo trutta far io*) and of huchen (*Hucho hucho* L.) are very special (Hocik et al, 1988; Bud, 2007; Pasarin, 2007), thus, by their breeding inside the pilot station can be obtained results, which could contribute both to obtain some superior and diverse fish productions, as well to promote some endemic species of Danube basin, and implicit of Romania.

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