

**COMPARATIVE STUDY ON THE HORMONAL
STIMULATION STERLET (*ACIPENSER RUTHENUS*,
LINNAEUS, 1758) USING CARP HYPOPHYSIS AND
ARTIFICIAL HORMONE TYPE NERESTIN 5-5A**

**STUDIUL COMPARATIV PRIVIND STIMULAREA
HORMONALA LA CEGA (*ACIPENSER RUTHENUS*
LINNAEUS, 1758) UTILIZÂND HIPOFIZĂ DE CRAP ȘI
HORMON ARTIFICIAL TIP NERESTIN 5-5A**

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Starting from the particular sturgeon reproductive biology, propagation of technology through artificial comprises a number of phases required including: selection, parking broodstocks cell maturation and sexual stimulation in order fertilized their conditions provided. To stimulate the process of sexual maturation of the sexual elements for sterlet could be hypophysis and also analogue gonadotropic hormone type Nerestin 5. Literature attesting to the use of sterlet dry hypophysis treated with acetone (Maria Caloianu-Iordăchel, 1973) and employing successful hormone analogue found as LHRHa (N.Patrichi and collaborators, 1989-unpublished data). Advantages and disadvantages of using hypophysis or gonadotropic hormone analogue fhdghghNerestin 5 are very important and decisive for modern aquaculture the century XXI century

Keywords: starlet, NERESTIN, sexual maturation

Introduction

The first researches in our country regarding the spawning of sturgeons were started from 1955 (Manea&Mihai) in the Danube Delta and then in the Litcov where were obtained sterlet larvae for the first time.

After the 90's, researches on artificial spawning of sturgeon have been taken by the team of researchers from the Centre for Research, Design for Fisheries, Fisheries and Fish Industrialization Galați.

This paper aims to compare results obtained from hormonal stimulation of *Acipenser ruthenus* using carp's hypophysis and artificial hormone type Nerestin 5.

Materials and Methods

After harvesting the biological material for reproduction and bringing it to the station to make some essential measurements (Table no.1) for the following technological processes.

For the experiment carried out at sturgeon' station two female and six male fish from the Danube were elected (Cotu Piscicii-Galați area).

Table 1.

Biometric data on the broodstock from the experimental group

No.	Gender	Total length (cm)	Body weight (kg)
1	♀	67	1,69
2	♀	66	2,00
1	♂	50	0,710
2	♂	57	0,770
3	♂	55	0,775
4	♂	52	0,635
5	♂	54	0,785
6	♂	52	0,690

In our experiment in order to stimulate ovulation and spermatation were used following hormonal preparations: hypophysis of carp and Nerestin 5A, commercial product by type LHRH from Russia.

Injections are made in the dorsal muscles of the anterior bodypart; males are injected later than females (5-6 hours). Hormonal injections are administered with a syringe of 1.0 -3.0 cm³ with needles of 23-25 gauge and 3.2 cm long, with blocks of transparent plastic. If a number of broodstock are stimulated to spawn, proper dosage is calculated and placed; each syringe is labeled in accordance with the selected fish.

Nerestin 5A is a hormonal preparation of LHRH, made of Russian manufacture. It is part of a wider range of products designed exclusively for fish and 5A - variant is created especially for sturgeon. Although we do not know and we could not find the exact composition of the preparation, considering the mode of action it seems to be a concentrated LHRH. The product is presented in liquid form in vials of 20 ml., containing 100 doses (0.2 ml. / kg. of bodyweight). Since directions for use and data supplied by the manufacturer (verbal information), it appears that the preparation contains a small amount of anesthetic.

Table 2.

Doses of exogenous hormone used in artificial reproduction of the species
Acipenser ruthenus, Linne 1758

Hormone used	Female	Male
Hypophysis of carp (mg./kg. bodyweight)	2,0 -4,5	2,0
Nerestin 5A (ml./kg bodyweight)	0,1 – 0,4	0,1-0,2

Depending on water temperature and physiological state of broodstock, these quantities can be corrected more or less.

Results and Discussion

For artificial reproduction of the species *Acipenser ruthenus*, the spawn are induced with exogenous hormonal injections to ovulate (females) or spermatation (males). Typically, it used natural hormones by extraction in physiological saline, purified or synthetic solution.

After calculations, according to the bodyweight (1.69 kg) the first female of the experimental lot (♀ 1) was injected a dose of 0,340 ml Nerestin 5A, the first injection of 0,068 ml and the second 0,272 ml; for the second female was used 3 mg injected of carp hypophysis also in two portions.

The reproductive females have had a period of 33 hours for maturation ♀₁, respectively 34 hours ♀₂ at a water temperature of 14 ° C.

The two females from the breeding lot have had 90% percentage of eggs collection (♀₁-3 portions) and 83% (♀₂-1 portion) according to table no. 3.

Table 3

Female	Number of portions	Total quantity (g)	Quantity / portion (g)	Percentage of eggs collection (%)
♀ ₁	3 portions	228	P ₁ – 106; P ₂ – 61; P ₃ – 61.	90
♀ ₂	1 portion	249	P ₁ - 150	83

Males and females have been injected, the first three female with Nerestin 5A (1 ♂, 2 ♂, ♂ 4) and the next three exemplars with hypophysary extract (3 ♂, 5 ♂, ♂ 6), according to the calculations made.

Table 4

Males from experimental broodstock showed the following quantitative and qualitative characteristics

No crt.	Males	Quantity (ml)	Viability %
1	♂ ₁	10	90
2	♂ ₂	15	80
3	♂ ₃	0	0
4	♂ ₄	10	70
5	♂ ₅	20	80
6	♂ ₆	5	50

There were some negative results concerning the male of experimental lot (♂₃ has not give sperm) as can be seen in Table 4.

Following the calculations carried out there it has established the following percentage of fertilization for the two females of the experimental lot: ♀₁ - 85% and ♀₂ - 70%. Also, the percentage of fertilization depends on the success of injections, respectively the degree of ovum preparation and not least by the exogenous hormone used. Time of fecundation for *Acipenser ruthenus* species is 3-5 minutes, during which time to intervene with a gentle shaking of the eggs.

Conclusions

Depending on the stage of maturation, both males and females behave differently to hormonal stimulation, having good or less good results in the process of artificial reproduction. Conclusions are listed in Table no. 5.

Table.5

Differences observed regarding the use of two types of exogenous hormones

Nr crt.	Nerestin 5 A	Hypophysary extract
1	It is a sterile substance; no request antibiotic treatment	It is completely nonsterile and antibiotic treatment requested
2	Presents important work and is convenient to apply the dose in ml / kg.	Not presents important work. Ultimately depends on individual differentiation stage of biological material: sex, age, size, quality required and many other factors. Dosing require additional recalculation: mg hypophysis in the form of suspension in ml correlated with fish weight.
3	Losses due the store are no	Suspension of hypophysis is not to be stored

	more than 5% per year	even in refrigerated conditions. Hypophysis by drying is not recommended to be stored more than a year, this leading to loss of capacity assets.
4	Does not contain adjacent substances and therefore no producing other types of reactions.	Contains a complex of adjacent substances and hormones over necessary which produce another types of reactions.
5	Preparation is not difficult. The probability to meet promptly the requirements any time.	It can be extracted through the slaughter of biological material immediately after the catch.
6	Much cheaper than hypophysis with production of 20-30%	Following the operation of hypophysis extraction, the consequence is a higher price.
7	It is available for use.	The specialists must prepare the dose of hypophysis suspension before each injection.
8	It is not an hormone preparation	It is an hormone preparation

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