

Research on response to the treatment with hypophysis extract and Ovopel concerning the quality and quantity of spawns and milt in *Cyprinus carpio* Lausitz variety

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Abstract. The experiment aimed to check the response to hormonal treatments in carp aged 5 years and older and higher body weights regarding qualitative and quantitative aspects of gametes. Research has been performed on a population of carp (*Cyprinus carpio*), Lausitz variety in Ariniş fishery complex, Maramures. The biological material was represented by a total number of 10 males with an average weight of 5600 g and 10 females with an average weight of 6300 g belonging to Lausitz variety carp population. We inoculated hypophysis extract and Ovopel, on groups with five individuals for each hormonal product, from each sex. It was found that treatment with Ovopel positively influences both the amount of carp milt and spawns. The fact that the treatment with Ovopel avoids transmission of disease in fish shoals caused by hypophysis extract preparation, but also for the fact it produces more rapid maturation and generates a larger amount of carp milt and spawns, we would recommend its usage in reproduction period for Cyprinidae species.

Key Words: Lausitz breed, maturation time, sample, average weight, spermatozoon.

Introduction. Research has been performed on a population of carp (*Cyprinus carpio*), Lausitz variety in Ariniş fishery complex, Maramures. Because most authors (Grozea et al 2004; Bud et al 2004) communicate issues regarding carp reproduction for 2.5-3.5 kg individuals, we have proposed that the research will be performed on individuals with weights and older ages to see if they can still be used for reproduction with good results.

The experiment aimed to check the response to hormonal treatments in carp aged 5 years and older and higher body weights regarding qualitative and quantitative aspects of gametes. There were highlighted the responses of two sexes in the treatment, establishing the quantity of spawns and milt and their number, by performing spermiograms.

The results highlight that there can be used for reproduction and kept in the selection nucleus carps with weights of 6000 g and over, having the age of five years and above, because the analyzes show great qualitative aspects of gamete material, mirrored in the number of larvae hatched after fertilization.

Material and Method. The biological material was represented by a total number of 10 males with an average weight of 5600 g and 10 females with an average weight of 6300 g belonging to Lausitz variety carp population, grown without the input of other reproduction individuals from other fisheries, for 10 years.

We choosed females and males of older ages and heavy weights which generally are not used in artificial reproduction. After conformation and constitution measurements in both males and females performed 7 days before hormonal treatment, we inoculated hypophysis extract and Ovopel, on groups with five individuals for each hormonal product, from each sex. We observed the hormonal response regarding sexual maturation with the two hormonal products and the quantity and quality of gametes. The

preparation and administration protocol of the two types of hormones is the standard one, according to body weight and the stage of gonads development (Sasca et al 2007). Ovopel treatment in females was applied at a dose of 4 mg/body weight and hypophysis extract was applied in two doses, being achieved 3 mg/kg body weight.

Results and Discussion. The response times of gonadal maturation in both sexes depending of the type of hormone used are reflected in Table 1. It was found that there is a significant time difference of more than two hours in behalf of Ovopel treatment (8.40 to 10.50 h) in females. The faster response time with about two hours can be attributed to faster absorption of Ovopel product compared to hypophysis extract, which gives the possibility in the same time to run a greater number of reproduction individuals on hatchery. During the reproduction period, carp males produce and eliminate almost continually the milt and we applied different hormonal treatment just to check the possibility of harvesting a larger quantity of milt required for fertilization in a short period of time. Following the different recorded time response in males after applied treatment, we observed differences over two hours in behalf of Ovopel treatment in males (7.40 to 9.55 hours).

Table 1

The average and spreading indices for the maturation time (h) of sexual products consecutively to the hormonal treatment - Lausitz variety

<i>Hormonal treatment</i>	<i>Males</i>				<i>Females</i>			
	<i>n</i>	<i>x ± sx</i>	<i>s</i>	<i>V%</i>	<i>n</i>	<i>x ± sx</i>	<i>s</i>	<i>V%</i>
Hypophysis extract	5	9.55 ± 0.56	1.30	13.61	5	10.50 ± 0.44	1.03	9.81
Ovopel	5	7.40 ± 0.46	1.08	14.59	5	8.40 ± 0.51	1.20	14.29

The Table 2 shows viability in seconds after the activation with water of male semen, oscillating in time among 156-195 seconds, similar values to those reported by Voican et al (1981) (180-300 seconds). Density is very high indifferently of male and mobility was evaluated with a maximum score of 5 in all analyzed samples, regardless the hormone type used.

Table 2

The main characteristics of the carp milt

<i>Viability, seconds after activation</i>	<i>Mobility (eval.)</i>	<i>Concentration 10⁹sz./ml.</i>	<i>Abnormalities of spermatozoons (%)</i>				
			<i>Head</i>	<i>Int. p.</i>	<i>Tail</i>	<i>Imatures</i>	<i>Total</i>
190	5	13.85	9	10	10	3	32
156	5	13.40	16	-	8	1	25
167	5	15.73	14	4	7	2	27
195	5	14.15	8	2	4	1	15
187	5	15.80	13	2	3	3	21

Perchec et al (1995) indicate a sperm concentration among 4-30 x 10⁹ sz. mL⁻¹, our observations indicate concentrations in the analyzed samples among 12.2 to 17.30 x 10⁹ sz. mL⁻¹. The share of morphological abnormalities observed in carp milt samples varied among 15-32%, comparable data to Horvath et al (2002) (10-39%).

Most abnormalities are found in the spermatozoons' head which is explained by the structure of fish testes, where tubules, respectively interior walls of lobes are made of Sertoli cells and germ cells located in them.

We observed the differences between the average number of spawns and carp milt, obtained from females and males after two hormonal treatments applied (Table 3).

Table 3

The average and spreading indices for the amount of spawn (g) and milt (ml) collected consecutively to the hormonal treatment with hypophysis extract and Ovopel in Lausitz variety

Hormonal treatment	Males				Females			
	<i>n</i>	$\bar{x} \pm s_x$	<i>s</i>	V%	<i>n</i>	$\bar{x} \pm s_x$	<i>s</i>	V%
Hypophyse extract	5	29.10 ± 2.65	6.20	21.31	5	820 ± 25.85	60.50	7.38
Ovopel	5	40.20 ± 3.06	7.15	17.79	5	1140 ± 31.43	73.55	6.45
Difference/signification			-11.10*				-320**	

*p > 0.05

There were significant differences for carp milt in favor of males treated with Ovopel, as well as the difference is highly statistically significant for the extra 350 g of spawns derived from females treated with Ovopel.

In both cases because the reproduction individuals have basically close differences and lived in the same environment, the only gametes quantitative difference can be attributed only to the type of action of the two treatments applied. To highlight the size and number of spawns we weighted and counted a gram of each female, taken randomly from the quantity of spawns.

For an accurate counting we collected randomly three samples/female observed. The variability number of spawns/gram was between 1100 and 1307 pieces spawns/gram which shows that regardless the applied treatment, their number and size is a genetic characteristic, with slight variations among individuals given by their variability.

Conclusions. At Lausitz carp variety there is a time difference in response about 2.10 hours in males and the same in females, from the time to inoculation to harvesting in behalf of Ovopel product.

Regardless of treatment applied the spermatozoons viability is between 156 and 190 seconds from activation and concentration ranges among 13.40 to 15.80 x 10⁹ sz. mL⁻¹, which shows that the type of hormonal preparation does not influence those extremely important issues for reproduction.

It was found that treatment with Ovopel positively influences both the amount of carp milt and spawns.

The variability number of spawns was between 1100-1307 pieces spawns/gram, which shows that regardless of the treatment applied, their number and size is a genetic characteristic, with slight variations on their variability among individuals.

The fact that the treatment with Ovopel avoids transmission of disease in fish shoals caused by hypophysis extract preparation, but also for the fact it produces more rapid maturation and generates a larger amount of carp milt and spawns, we would recommend its usage in reproduction period for Cyprinidae species.

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