EARLY DEVELOPMENT OF STERBEL HYBRIDS *Acipenser ruthenus* x *Huso huso* PRODUCED BY CRYOPRESERVED SPERM

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Introduction

In the present research, hybridization of the sterlet *Acipenser ruthenus* with the beluga *Huso huso* was carried out using cryopreserved sperm to produce the intergeneric hybrids called sterbel. The percentage of fertilization, survival, embryonic and larval development of sterbel hybrids were analyzed. In the present study, the genetic analysis of sterbel hybrids was performed using species-specific markers to confirm interspecific hybridization.

Materials and methods

Sterlet eggs fertilized with cryopreserved beluga semen (E1,E2,E3; experimental groups) or fresh semen collected from sterlets (C1,C2,C3; control groups) were incubated at the Wąsosze fishing farm near Konin, Poland (Figure 1.). During the incubation of fertilized eggs, the analysis of survival and embryonic development were carried out in all experimental and control groups. The body weight and body length of experimental and control group fish were measured beginning from 30 dph (days post hatching). The measurements were conducted on five dates (30, 37, 44, 56, and 89 dph), separately in each of the 11 fish from each group (sterbel – experimental group; sterlet – control group). Genetic verification of sterbel hybrids was conducted based on the two nuclear DNA fragments characteristic for sterlet (247_Arp) and beluga (153_HHp).

Results and discussion

The analysis of embryonic development in the experimental groups of sterbel hybrids showed no developmental differences compared to the control groups. The survival of individuals in the experimental groups E1,E2,E3 was similar compared to the control groups C1,C2,C3. After 110 hours of embryo incubation, the larvae hatched (Figure 2.). The growth analysis of sterbel hybrids was carried out from 30-89 dph, based on the length and body weight (Table 1., Figure 3.) of the fish and the SGR index. This analysis showed faster growth of sterbel hybrids (SGR=10,4%) compared to sterlet from the control group (SGR=9,1%).

Genetic analysis confirmed that the sterbel hybrids inherited the genotypes from sterlet (mother) and beluga (father).

This is the first report that presents the analysis of the growth of sterbel hybrids produced using cryopreserved semen. The proposed research method confirms importance of valuable sturgeon hybrid production using cryopreserved sperm banks.

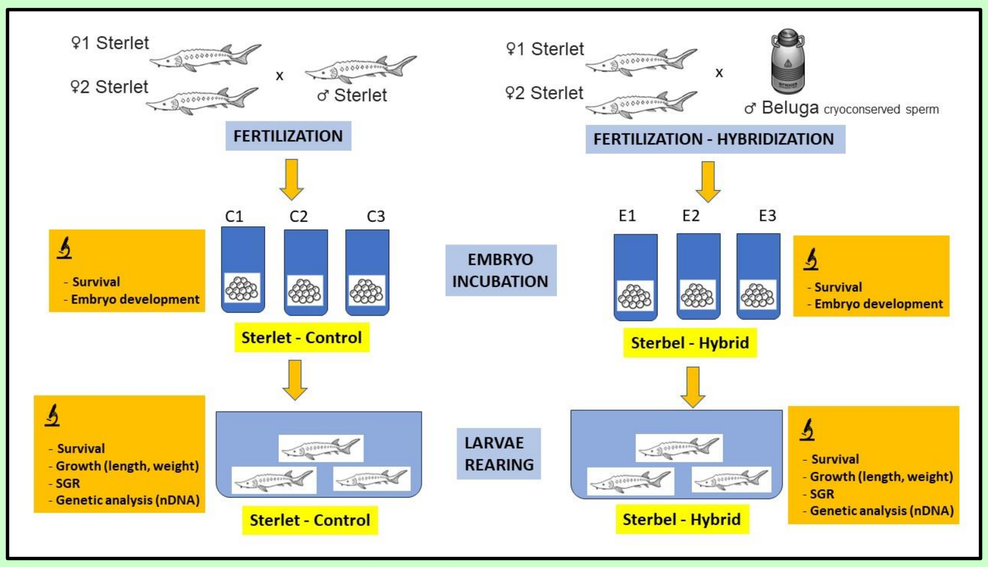

Figure 1. The graphical experimental design.

Table 1. Growth of sterbel hybrids *Acipenser ruthenus* x *Huso huso* produced by cryopreserved sperm compared to sterlet (control group).

Fish age	Length (mm)		Weight (mg)	
in dph	STERBEL	STERLET	STERBEL	STERLET
30	28,6 ± 1,0[a]	21,9 ± 1,6[b]	152 ± 18[a]	63 ± 16[b]
37	30,6 ± 1,9[a]	24,7 ± 0,9[b]	257 ± 56[a]	117 ± 15[b]
44	39,8 ± 2,4[a]	28,9 ± 2,1[b]	416 ± 35[a]	212 ± 61[b]
56	55,1 ± 2,8[a]	44,8 ± 6,3[b]	932 ± 88[a]	535 ± 195[b]
89	147,0 ± 7,5[a]	98,3 ± 10,2[b]	20414 ± 1860[a]	4491 ± 1535[b]

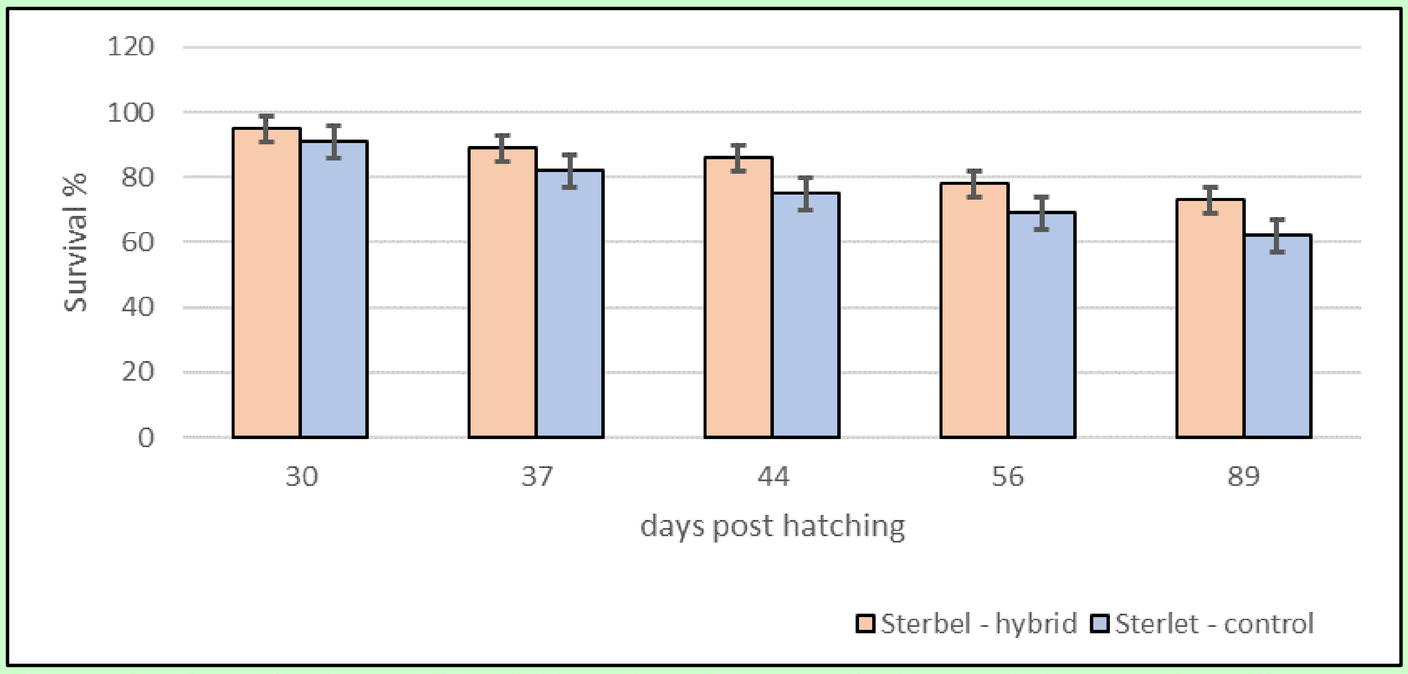

Figure 2. Survival of sterbel hybrid and sterlet control larvae during experimental rearing. Bars represent standard errors.

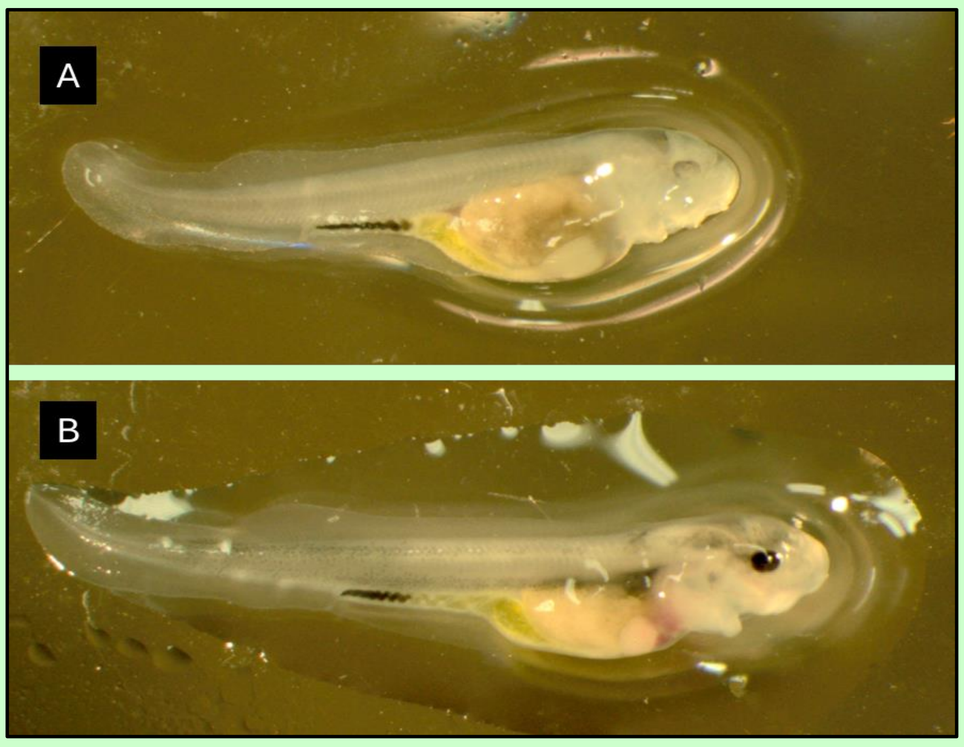

Figure 3. Sterbel hybrid (*A. ruthenus* x *H. husk*) and sterlet (*A. ruthenus*) larvae after yolk sac absorption. A- sterlet; B - sterlet x beluga.

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