



OUT-OF-SEASON SPAWNING OF THREATENED WEATHERFISH MISGURNUS FOSSILIS (L. 1758) USING COMMERCIAL PREPARATIONS CONTAINING GnRH ANALOGUES

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Introduction:

Weatherfish is the stenotopic fish species dwelling rivers in the Central Europe. Although, weatherfish has no economic value, it is a significant element of the local water ecosystems. In Poland, weatherfish is listed as a threatened species due to the antropogenic degradation of its natural habitat and unfavourable environmental changes. Suggested active protection includes development of efficient techniques of controlled reproduction and fry rearing for the restocking. The study on the efficacy of GnRH analogues in out-of-season weatherfish reproduction is precisely embedded in the range of actions adressed to maintaining of faunistic biodiversity of water ecosystems in Poland.

Methods:

In total, 31 specimens (17 females and 14 males) of 19.5 ± 2.1 length and 30.2 ± 8.6 g weight were caught in November 2006 by means of electrofishing or trap net from Sątopy-Samulewo artificial water body (former polder) (NE Poland), transported to the laboratory and placed in the tanks supplied with the tap water. Water temperature in the tanks was 8°C and did not vary from the water temperature in Sątopy-Samulewo. During the next 44 days, fish were stimulated by the gradual change of photoperiod (from 10L:14D to 15L:9D) and increase of temperature up to 19°C. Then, weatherfish were selected by sex and divided into three experimental groups: fish stimulated by the intraperitoneal injection of Ovopel (mGnRH) (6 females and 5 males), Ovaprim (sGnRH) (6 females and 5 males) and left without any treatment - control group (5 females and 4 males). Collected groups of eggs were fertilized with the mixed sperm obtained from males. Sperm motility was assessed subjectively under light microscope (magnification 500×). Fertilized eggs were incubated on Petri dishes in water of temperature 20.0 ± 0.1 °C, pH 7.7 and oxygen saturation over 80%. Survival rates were evaluated 24 hr after fertilization and soon after

hatching. Moreover, the morphological development of the hatched fish was examined. Results were analyzed with the test of significance of structure coefficients, non-parametric Mann-Whitney and chi² tests using Statistica 9.1 software.

Results:

The eggs from 83% of females and the sperm from all the males were obtained 12 hours after Ovopel injection. The relative weight of the eggs ranged from 3.2 to 7.8% of the female body weight and was significantly higher than eggs provided in the course of Ovaprim stimulation ($p < 0.05$). The time of latency strongly varied in the case of Ovaprim stimulated fish. After Ovaprim treatment ovulation was induced in all the females, however the ovulation time ranged from 36 to 42 hours. The sperm was obtained from 80% of males 24 to 36 hours after Ovaprim injection. The mean motility of the sperm from mGnRH stimulated males was 68% (± 12 SD) and from those stimulated with sGnRH 77% (± 8 SD). A small amount of the sperm was obtained from the only one male from the control group. Sperm motility was estimated as about 65% and was not significantly different from stimulated groups. However, the mean percentage of alive and normally developed larvae in the control group (4.5%) was significantly lower ($p < 0.001$) from Ovopel (72%) and Ovaprim (14.2%) stimulated groups.

Conclusion:

Ovopel was the most efficient GnRH analogue applied for the stimulation of weatherfish reproduction due to the best synchronization of the ovulation, the highest percentage of spermiation, the biggest relative weight of the obtained eggs and the highest larvae survival. Our study proved that the procedure of out-of-season reproduction stimulated by GnRH analogues is efficient and may increase the chance of success of weatherfish reintroduction in Polish waters.