

OBSERVATIONS ON TANK SPAWNING OF PIKEPERCH FEMALES WITHOUT MALE COMBINED WITH OVARIAN LAVAGE

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Introduction

The development of pikeperch (*Sander lucioperca*) production has accelerated over the last 20 years, thanks to significant R&D efforts. In addition to traditional pond production, the growth of intensive farming is also striking. The first step is the development of the controlled and programmed reproduction. At present, hatchery breeding using *in vitro* fertilisation (collection and dry fertilisation of the gametes) is the most researched area. In our previous studies, we demonstrated that sperm injected into the ovaries of externally fertilized fish retains its fertilizing ability several hours before induced ovulation. This method can be successfully used in combination with (Müller et al. 2018, 2020) or without hormonal treatment (Gazsi et al. 2021) in case of several species. The aim of our study was to investigate the efficiency of sperm ovarian lavage in case of pikeperch induced spawning in the absence of male. Additionally, in order to assess the appropriate moment for the lavage, we monitored the effect of carp pituitary (CP) suspension on final oocyte maturation and ovulation.

Materials and methods

The pikeperch broodstock was transported from the Nagyatád V95 Ltd fish farm (Nagyatád, Hungary) to the Laboratory of MATE Kaposvár Campus. The fish were sorted by sex (10 females, 4 males) and individual females were separated in 250 l tanks, while male specimens were placed in pairs into two 300 l tanks. The tanks were in same water circuit and the water temperature was maintained between 13.2-14.7°C. Hormone treatment of singular injection of 7 mg/kg CP was administrated intraperitoneally. The maturation stages of oocytes (Zarski et al., 2012) were assessed following biopsy sampling of all females at three different moments - at the same time as hormone treatment (0 h), at 48 h and 70 h post-injection. Clarified oocytes were photographed and oocyte stage was evaluated. Artificial nest substrate (60×70 cm) was inserted for spawning, straight after sperm ovarian lavage. The method of sperm injection was as described by Müller et al. (2020). Briefly, 1 ml sperm per kg of female's body weight was equally divided into two ovarian lobes 75 h after hormone treatment. The timing of sperm injection was determined based on the oocyte stage and previous studies so that the "ovarian storage time" would not exceed 40 h, the time when spermatozoa fertility greatly reduces (Müller et al., 2020).

Results

In total nine fish ovulated and released their eggs. The maturation dynamics of the 9 females showed large individual differences, visible in latency time being at 83h (n=1), 88h (n=1), 95h (n=5), 99h (n=1), 154 h (n=1). Several fish did not ovulate on the artificial substrate but disposed the eggs next to it (n=4). Fertility values measured at 72 h post-fertilisation showed large individual differences in total range 0-84%. There was no correlation between the fertilisation rate and ovulation time (sperm storage time).

Discussion

The ovarian lavage method was successfully used with different siluriform and cypriniform species (Müller et al., 2018, 2020; Gazsi et al., 2021). To the best of our knowledge, this is the first report on the application of this fertilisation method in pikeperch. The outcome of the technique appears to be rather variable, nevertheless, such variability was already described in pikeperch on different issues (Ljubobratović et al., 2017, Zarski et al., 2019; Colchen et al., 2020). Therefore, future studies are required to adapt this method to pikeperch and other perciforms respecting the biology of their gonads.

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