Practical insight in artificial reproduction and larval rearing methods at Research Institute for Fisheries and Aquaculture NARIC HAKI

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Abstract

For a five continuous years now, at the site of NARIC HAKI and in cooperation with H&H Carpio Ltd., Ócsárd, Hungary, the R+D works are focused mainly on the development of sustainable technologies in two most critical issues of pikeperch culture: artificial propagation and larviculture. Methods have been developed and are still under refinement in order to minimize labour and risks in practically important problems of mentioned parts of culture of the given species.

Hormonal preparations for spawning induction recently used at our hatcheries are human chorionic gonadotropin (hCG) and salmon gonadotropin releasing hormone analogue (sGnRHa). Following injection, the stage of final oocyte maturation (FOM) is monitored on a daily basis. Once the female reaches the stage VI of FOM, its genital papilla is being sutured in order to prevent spontaneous ovulation and eggs disposal in the tank. Further on, ovulation is regularly checked every six to four hours, depending on the water temperature (12-14 °C, respectively). Prior to collection of gametes, breeders are anaesthetized in 2-phenoxyethanol solution. Sperm is being collected by catheter in order to prevent the urine contamination. Eggs are fertilised with milt on a dry method with ratio 0.5-1 ml of sperm per 100 g of eggs. Following fertilisation, egg de-adhesion is being done with milk+kaolin method. Eggs
incubation is carried out on 15-16 °C and in order to prevent fungal diseases and premature hatching water oxygen saturation is maintained on 110-120 %.

Larval rearing tank is of cylindro-conical shape enabled with two flow patterns: up-welling and circular. Cylindrical part of the tank is coloured black, while the conical is white. Surface cleaning is being carried out by sprayer with flat fan nozzle. Light source is a dimmable LED string, enabling application of soft light on the water surface. Larval rearing protocol is defined according to two periods: period until the completion of swim bladder inflation (SBI) and period post-completion of swim bladder inflation (post-SBI). During the SBI period up-welling flow is provided to larvae with exclusive feeding with Artemia nauplii. Light regime is kept low, up to 15 lux, with photoperiod 14:10 LD and temperature being constant on 16 °C. During the post-SBI period fish are kept in circular flow pattern with constant light being increased up to 40 lux. Weaning onto inert diet is being carried out during the first week of the post-SB period and performed gradually, thus from the age of three weeks fish are fed with dry feed exclusively. During weaning, temperature is gradually being increased from 16 to 19 °C and kept constant further on. At the age of one month, fish are harvested and sorting of fry is being carried out in the 2-phenoxyethanol solution. Juveniles are reared for further week before transport.

Recently, the technologies are being transferred onto industry level inside the country. Early reports are indicating that the technology is ready to be extended onto commercial level. Institute can offer the training for interested stuff in the mentioned parts of culture. Besides the further refinements of the technologies, our present research is targeting the controlled induction of gonadal maturation with respect to photo-thermal regime and nutrition.