

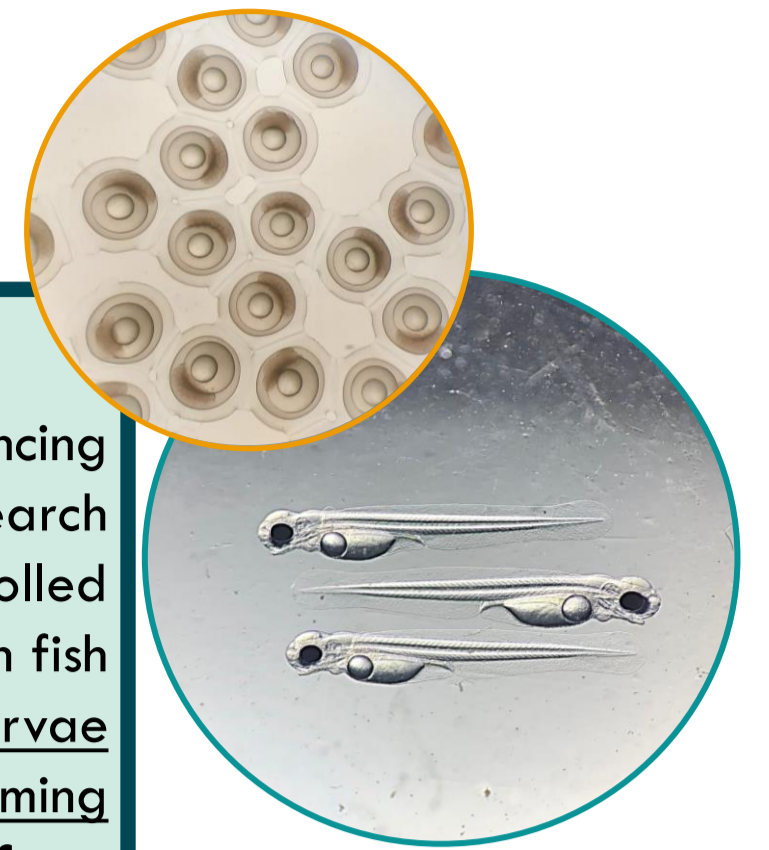
# DO LOW-QUALITY EGGS YIELD LOW-QUALITY LARVAE? THE CASE OF EURASIAN PERCH

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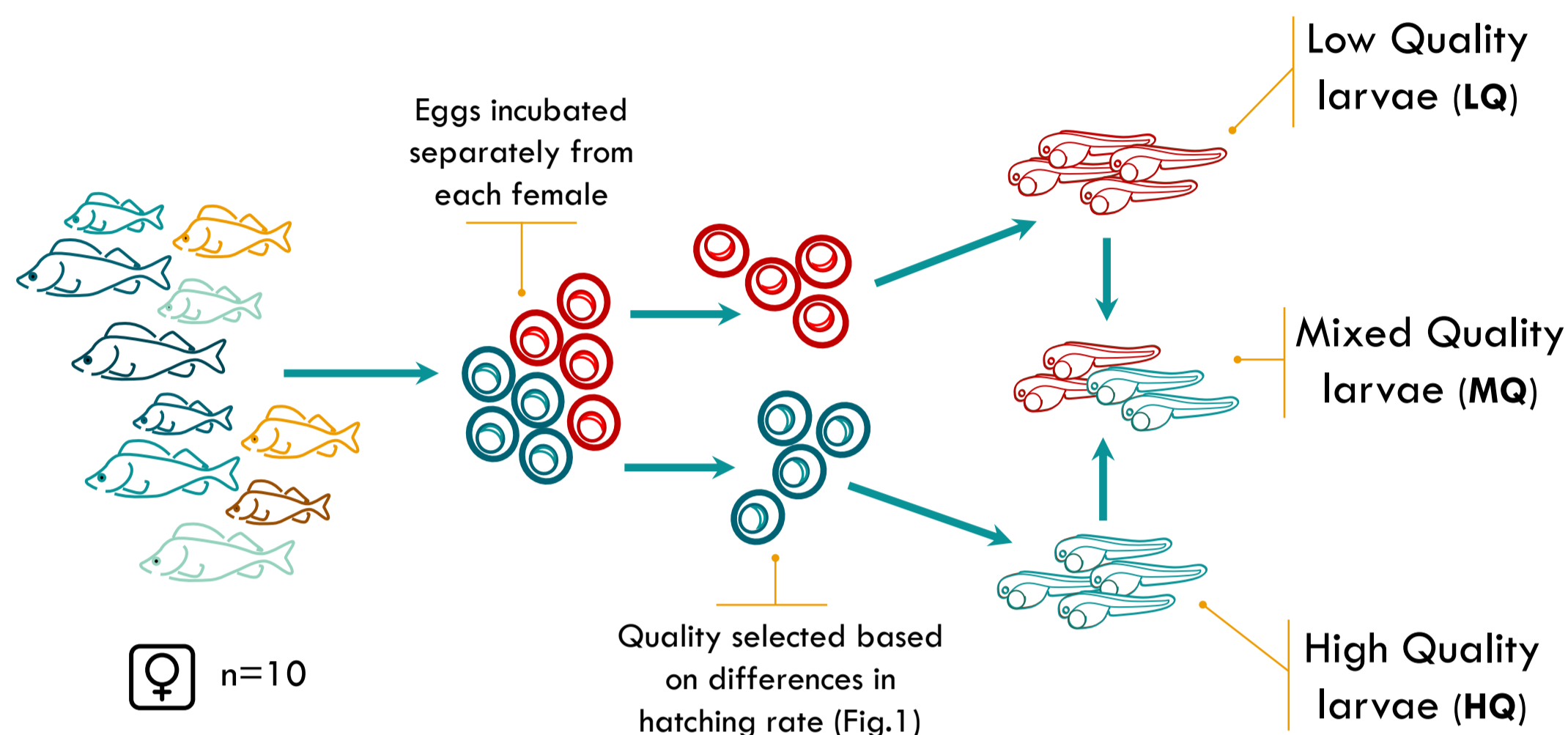
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## Introduction

Since the 1990s, the Eurasian perch (*Perca fluviatilis* L.) has been identified as a significant fish species for enhancing aquaculture diversity in Europe. Although commercial production of this species is already established, ongoing research is still advancing the understanding of its biology, reproduction technologies and larval rearing in controlled environments. It is believed that high quality eggs in fish significantly contribute to better survival and growth rates in fish larvae, positively impacting overall productivity in aquaculture. However, it is still not clear whether the "normal" larvae (the ones not showing any symptoms of developmental abnormalities) coming from various egg quality, are performing differently while cultured. In present study we compared rearing efficiency of Eurasian perch larvae obtained from eggs of high-quality and low-quality either grown group-wise or being mixed.

## Materials and methods

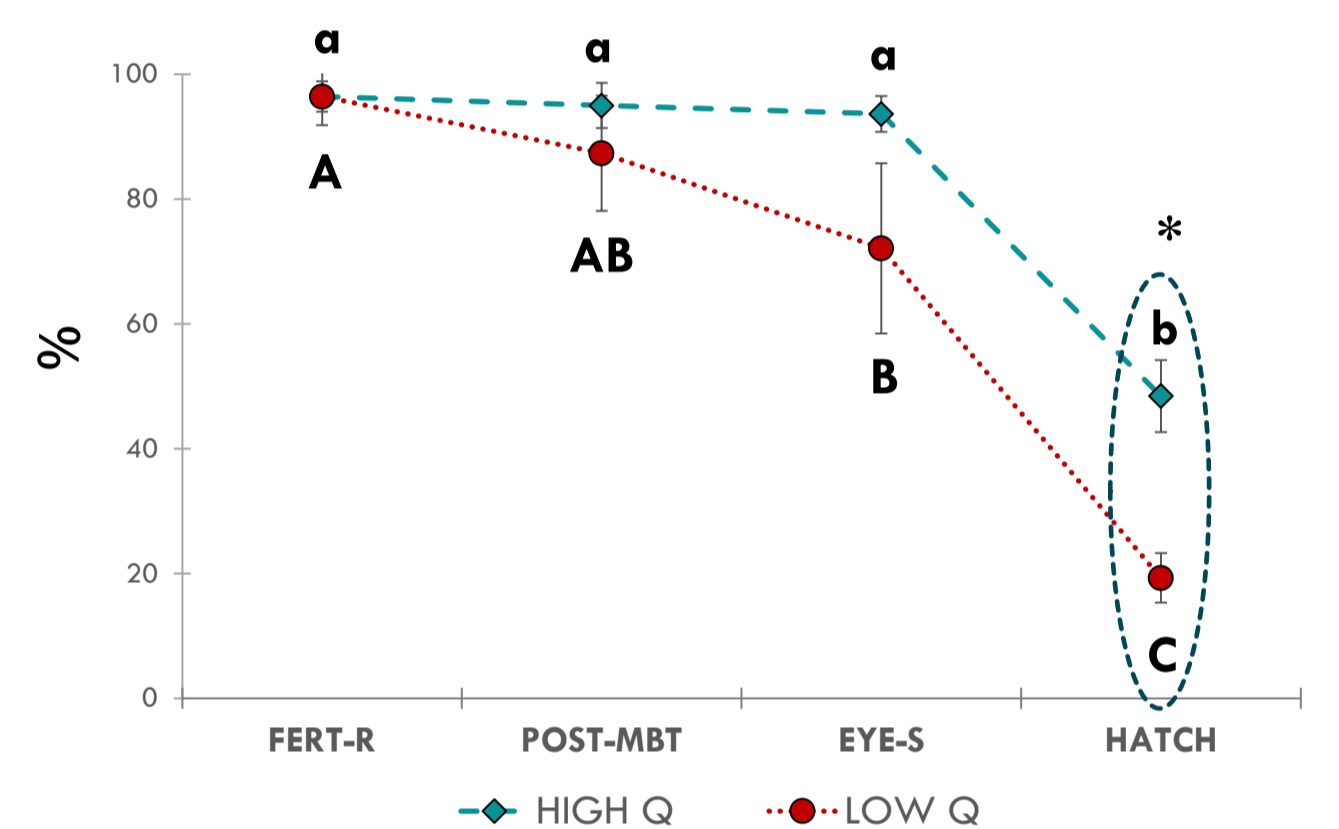


## Zootechnical parameters collected:

- Deformity rate
- Total length (TL, mm)
- Wet body weight (WBW, mg)
- Swim bladder inflation effectiveness (SBIE, %)
- Mortality
- Percentage of eating larvae

## Results

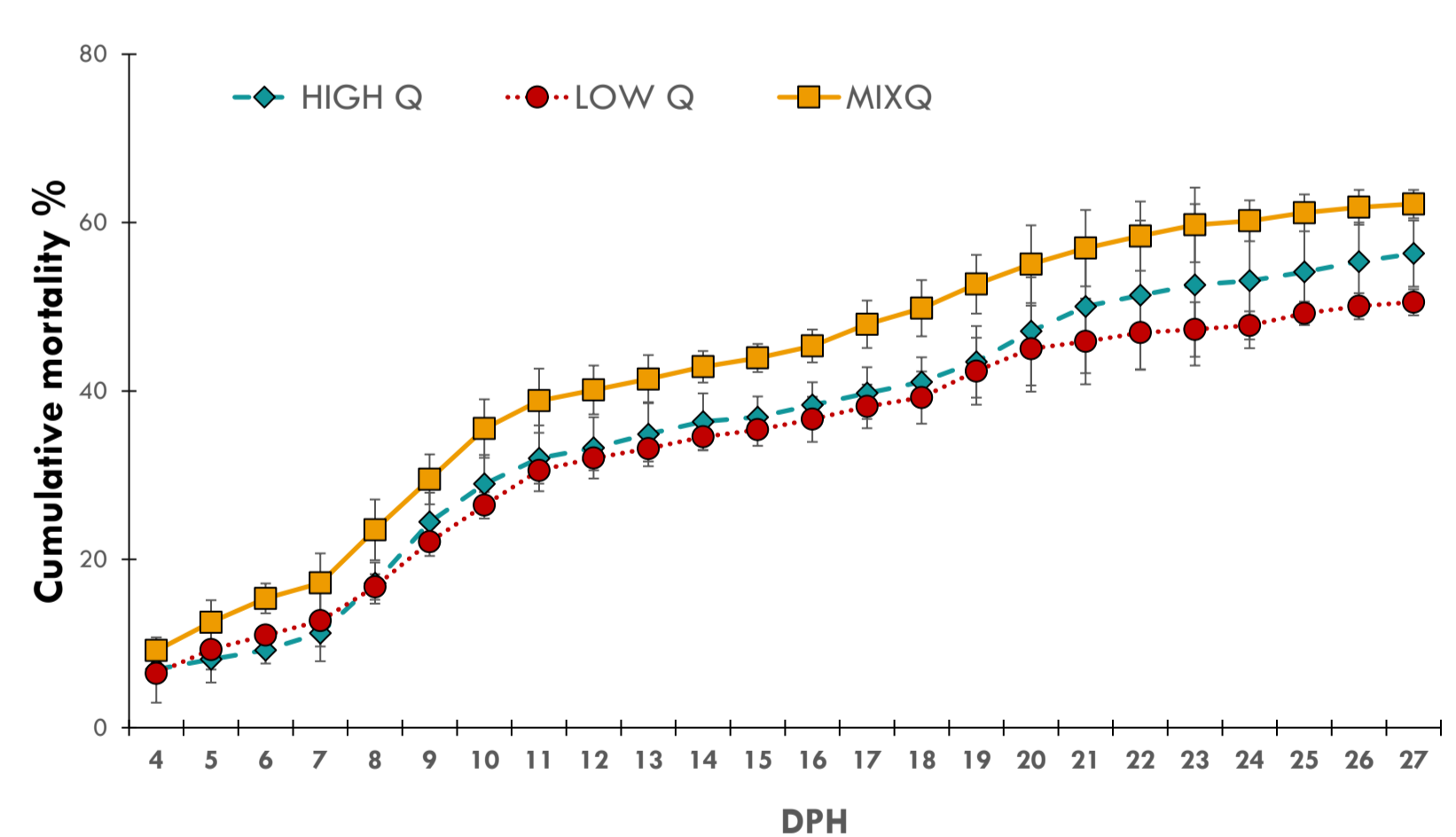
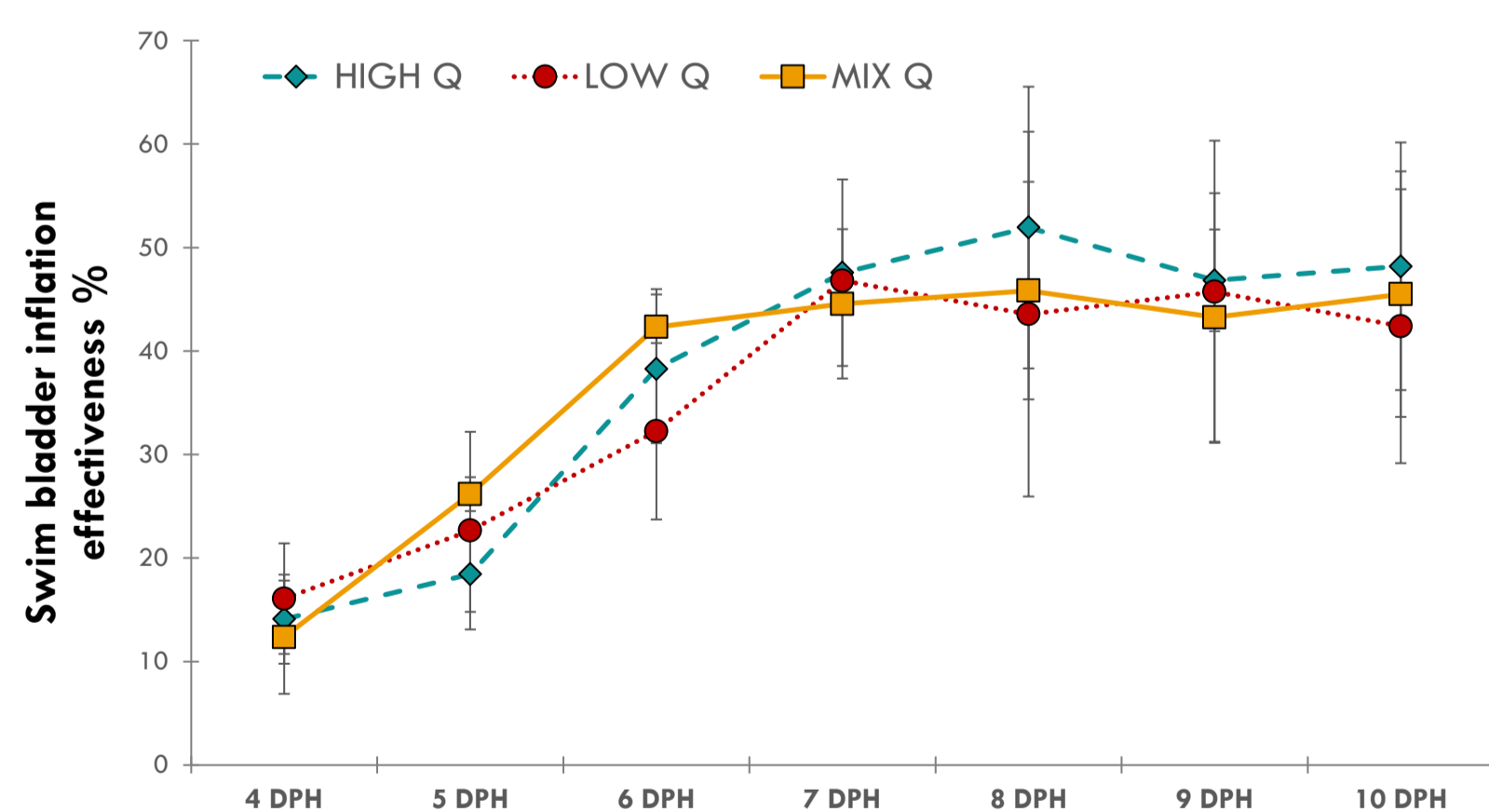
Significant differences ( $p < 0.05$ ) in hatching were observed between HQ and LQ eggs, with hatching rates of  $48.4 \pm 5.7\%$  and  $19.29 \pm 3.9\%$ , respectively. Significant differences were also found between FERT-R and HATCH in HQ group. In LQ group, significant differences were observed between FERT-R, EYE-S, and HATCH (Fig. 1). However, no significant differences ( $p > 0.05$ ) were found during the rearing trial in terms of: TL, WBW, the percentage of eating larvae, SBIE (Fig. 2), and cumulative mortality (Fig. 3) between groups.



**Fig. 1.** Survival of embryos from high and low-quality eggs at different embryonic stages: FERT-R – fertilization rate, POST-MBT – post mid blastula transition, EYE-S – eyed-eye stage, HATCH – hatching, HIGH Q – high quality eggs, LOW Q – low quality eggs. Asterisk – indicate significant differences between the groups. Small letters indicate differences in HIGH Q group and capital letters in LOW Q group ( $p < 0.05$ ).

The obtained data were analysed using two-way ANOVA, and Tukey's post-hoc test ( $p < 0.05$ ). All statistical data were performed using Statistica software by StatSoft.

**Fig. 2.** Swim bladder inflation effectiveness (SBIE, %) of Eurasian perch larvae. DPH – days post hatch. No statistical differences found ( $p > 0.05$ ).

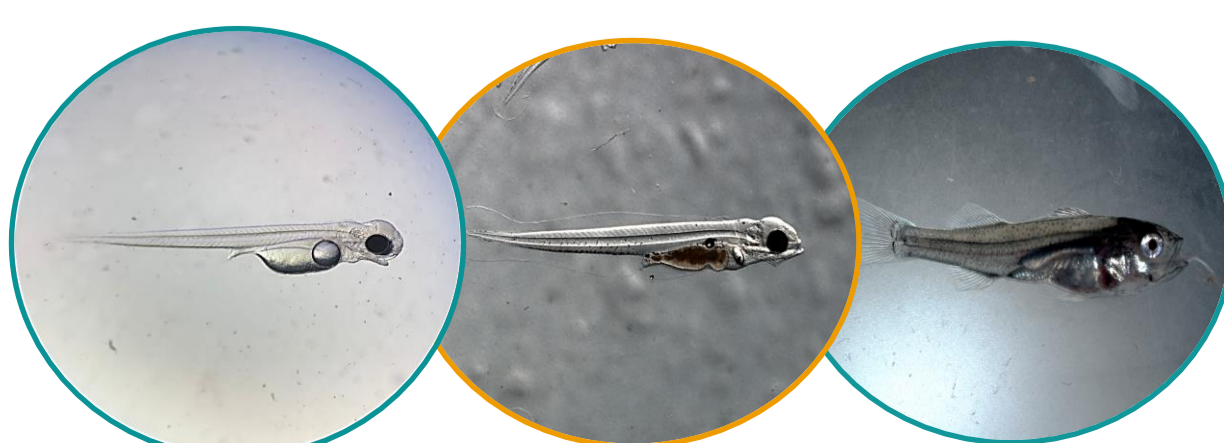


**Fig. 3.** Cumulative mortality (%) of Eurasian perch larvae during rearing trial. No significant differences found ( $p > 0.05$ ).

## Discussion and conclusion

The most widely accepted definition of egg quality is, its potential to produce a viable embryo. In our study we have observed considerable differences in terms of egg quality which resulted in significantly lower hatching rate. However, surprisingly no significant differences were observed in terms of performance of larvae obtained from either HQ or LQ groups. Also, there were no differences in MQ group, what indicates that **larvae obtained from various egg quality were not exhibiting different within-stock interactions.** These results indicate that **European perch larvae which managed to hatch, had the same chance for survival and proper development, regardless of whether they came from eggs of high or low quality.**

While, in fact incubating low quality eggs will bring the breeder a smaller number of larvae (due to higher mortality during embryonic development, which will lead to a lower hatching rate), the remaining individuals can be considered as high quality ones. Therefore, the widely observed within-group variability (typical for Eurasian perch) is stemming from other factors, which still need more attention and should be addressed by a more specific experimental operation.



## Acknowledgment

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