

## **A description of the optimal salinity to enhance husbandry of medaka (*Oryzias latipes*) eggs**

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Medaka (*Oryzias latipes*) is a widely used model organism for studies of toxicology, genetics, behavior and evolution. However, little information is available regarding the conditions of egg-rearing that maximize the efficiency of a husbandry program for this species. The addition of salt solution is known to enhance survival of some fish larvae but it is not known if this is true for medaka or if the addition of small amounts of salinity ( $\leq 5$  parts per thousand, ppt) may deleteriously affect the competency of eggs. In this study we allocate Medaka eggs ( $n = 68$  to  $96$ ) to three replicated ( $n = 3$ ) salinity treatments (zero ppt, 2.5 ppt, and 5 ppt) to determine the proportion of eggs that hatch, describe the temporal dynamics of hatching, and explore the causes of mortality of eggs. We found that the mean proportion of eggs that hatch to larvae in each of the three treatments is 73% (95% confidence interval: 53 to 93%) and that there was no significant differences in mean number of larvae produced as a proportion of eggs among the treatments ( $p > 0.05$ ). We used a two parameter logistic curve to describe the relationship of the cumulative number of larvae collected as a function of the number of days after eggs were collected (days post hatch, DPH) and found no difference in the curve parameters among the three treatments. There was no difference in the composition of the terminal stage (larvae, fungal infestation, or dead/unfertilized) of eggs in each of the zero ppt and 2.5 ppt treatments ( $\chi^2$ ,  $p < 0.05$ ) however, the composition of eggs in each of the terminal stages of the 5 ppt treatment were variable and were independent of the treatment effect. Based on our results we recommend using a dilute salt solution with a concentration of 5 ppt because hatching rate and larval production are not deleteriously affected by this concentration and, although we did not test it here, previous studies have shown that larval health is increased with this concentration. This work may be applicable to other fish species and provides support for using a concentration of 5 ppt for medaka husbandry.