

## **A description of maternal effects on egg size and larval performance of medaka (*Oryzias latipes*)**

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The importance of the non-genetic influence between generations is well documented: propagule or egg size can influence early developmental trajectories. In this study we used Medaka (*Oryzias latipes*) to examine how egg size varied with the size (length and weight) and age of mature females, described how egg size varied with the number of eggs produced, and described how daily growth rate of larvae varied as a function of the magnitude of parental investment. We collected eggs from mature females ( $n = 66$ , age 74 to 132 days) and counted and determined their size using digital image analysis. We then incubated eggs and monitored larval growth rates. We found that egg size decreased significantly with both age (days) and mass (grams) of females ( $R^2 = 0.15$ ,  $p < 0.005$ ). Mean egg size was inversely proportional to the number of eggs produced ( $R^2 = 0.58$ ,  $p < 0.005$ ). Larval growth rate was negatively correlated with egg size ( $R^2 = 0.48$ ,  $p < 0.005$ ) however, the mean size of larvae at hatching was positively correlated with egg size ( $R^2 = 0.58$ ,  $p < 0.005$ ). Our results indicate that female Medaka produce eggs with variable sizes based on their age and weight. The negative correlation associated with egg size and number implies a tradeoff in the allocation of maternal resources. Although we document early differences in ontogeny (larval growth rate) as a function of egg size it is not clear how these differences in larval performance may affect evolutionary fitness.