



**CALIFORNIA STATE SCIENCE FAIR
2011 PROJECT SUMMARY**

Name(s) Michael A. Salmond	Project Number S2211
Project Title An Order of Fry with Salt: A Process for Breeding Freshwater Mollies to Produce Saltwater Fry	
Objectives/Goals Is it possible for freshwater mollies to give birth to fry that are capable of surviving in a saltwater environment?	
Abstract Methods/Materials Establish freshwater 10 gallon tank with pregnant mollies at 78 degrees with daily food. Establish two 2.5 gallon tanks (salt and fresh) for the silver mollies to #birth# in. Over 3 days, add salt to the brackish water tank until it reached the level of 1.007 (magic salinity number-it matches salinity of the mollies amniotic fluid). On Jan 20, I placed one silver molly in brackish tank and one in freshwater birthing tank because they appeared ready to birth fry. Within 24 hours, both had birthed fry over a six hour period. The molly in brackish tank had about 35 fry and the other had about 30 fry in freshwater tank. On Jan 22, I removed adult mollies from birthing tanks and returned them to freshwater tank to avoid any loss of fry through consumption by adults or overcrowding. Every day I fed fry a small amount of First Bites Fish Food and recorded time it took for all fry to eat food. I also recorded daily salinity of brackish tank. After fry had survived for a few days, I began to gradually add salt to brackish tank to increase salinity. I measured salinity using a Hydrometer to record daily levels. I raised salinity level very slowly to avoid stressing fry; some days I would not add any salt. Once each week I cleaned fish tanks by replacing 50% of water, matching salinity reading in saltwater tank. Track fry daily eating until salinity in brackish tank reached 1.023 ppt. At least 3 pregnant mollies, 10 gallon fish tank, 2 2.5 gallon fish tanks, Fish food, Aquarium Salt, Hydrometer, Skewer, Timer, Fresh water, Bucket, Syphon, Measuring spoons, Spare Filters, Water Conditioners, Fish Net	
Results Saltwater fry have survived with no changes in eating habits compared to freshwater fry. In fact, the saltwater fry were more active, robust, and better eaters than the freshwater fry.	
Conclusions/Discussion Freshwater molly birthed fry in brackish environment (1.007 PPT) without harmful effects. Fry survived birthing despite mother being freshwater fish because 1.007 PPT salinity matches mother's amniotic fluid. Saltwater fry thrived in brackish environment while salinity gradually increased to saltwater aquarium level (1.023#1.025PPT) because fry's sodium or potassium ATPase enzymes were never deactivated because fry were never in a freshwater environment.	
Summary Statement To see if it is possible for freshwater mollies to produce fry that can survive in a saltwater environment.	
Help Received Mom helped with maintaining aquariums.	