



**CALIFORNIA STATE SCIENCE FAIR  
2017 PROJECT SUMMARY**

<b>Name(s)</b> <b>Insun Won</b>	<b>Project Number</b> <b>S2318</b>
<b>Project Title</b> <b>Effect of Varying Food Concentrations on Purple Urchin (Strongylocentrotus purpuratus) Larvae Development</b>	
<b>Abstract</b> <b>Objectives/Goals</b> This project was designed to determine the effects of varying concentrations of phytoplankton on the larval arm to body ratio of <i>Strongylocentrotus purpuratus</i> , which is essential for the urchin to stay upright in the water column. It was hypothesized that a smaller concentration of food for the larvae would lead to a larger arm to body ratio, as noted in similar experiments in this organism. <b>Methods/Materials</b> Sea urchins were chemically induced to spawn for this experiment. On the third day post-fertilization, the blastula were thinned out into approximately equal quantities and were placed in treatment groups (food concentration of 0, 1000, 3000, 10000, 30000 cells/mL). The food given was <i>Isochrysis galbana</i> paste. On the 13th day, photos of five randomly selected individuals per treatment were taken. Then, using image analysis, the larval arm and body lengths were measured. <b>Results</b> Generally, there is a negative correlation between the concentration of food and the arm to body ratio of <i>S. purpuratus</i> larvae. Surprisingly, the arm to body ratio of the starved condition was smaller than the ratio for the condition with 1000 cells/mL. The analyzed data showed that there were significant differences between treatments, signifying that an increased quantity of food leads to a smaller ratio. <b>Conclusions/Discussion</b> The results supported my hypothesis that a larger concentration of food would lead to a smaller arm to body length ratio. Knowing the effects of the changing food quantities on the urchin larvae is important when the future of phytoplankton densities and distributions is uncertain.	
<b>Summary Statement</b> As found by the varying arm to body ratios in urchins, I found that urchin larvae have significantly shorter arms when fed greater quantities of food.	
<b>Help Received</b> I received help with spawning urchins with syringes at Cabrillo Marine Aquarium. Dr. Darrow and other aquarium staff helped supervise my project, but I designed and experimented on my own.	