Apr 21st, 10:00 AM - 11:00 AM

Testing the Effects of Food Density on Echinoderm Larval Growth and the Correlation Between Juvenile Biomass and Size

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TESTING THE EFFECTS OF FOOD DENSITY ON ECHINODERM LARVAL GROWTH AND THE CORRELATION BETWEEN JUVENILE BIOMASS AND SIZE

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I tested the hypothesis that juvenile size (surface area) accurately predicts juvenile organic content (biomass) in the sea urchin Arbacia punctulata (Echinodermata). Results of previous experiments with sea urchins suggest that juvenile size and survivorship are directly related to size of the eggs and free-swimming developmental stages (larvae) and the amount of available food (Emlet et al., 1987). To date, there is no published work that tests the hypothesis assumption that a larger juvenile possesses more biomass. If juvenile size does not predict juvenile biomass, then size per se may not be the critical factor predicting juvenile survivorship. Results of research presented last year revealed that when larvae were provided with an unlimited amount of food, juvenile size (surface area) significantly effects the amount of organic content, but there was not a predictive pattern between the two. I have extended this research project to evaluate the influence of a specific diet ration on juvenile size, biomass, and the correlation between these two variables. To date, after 10 weeks of continuous culturing, no larvae reared at the low food density ($5x10^2$ cells per ml) completed development to the juvenile stage. In contrast, 82 larvae in the high food treatment ($5x10^3$ cells per ml) successfully metamorphosed to become juvenile sea urchins. This experiment is ongoing and measurements of juvenile size, biomass, and their correlation are pending.