CALIFORNIA STATE SCIENCE FAIR
2004 PROJECT SUMMARY

Name(s)

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Project Number

S1903

Project Title

Fun in the Sun: A Comparison of Fertilization Rates in L. pictus and S. purpuratus When Exposed to Ultraviolet Light

Abstract

Objectives/Goals

This experiment observes the fertilization rates of Sea urchin eggs in the presence of UV light in different amounts of time.The purpose is to determine the percentage rate at which Sea urchin eggs are first able to fertilize in each of the different exposure times.

Methods/Materials

Our method included using a 40-watt UV lamp. We first irradiated eggs and sperm separately for different lengths of time-0, 1, 2, and 5 minutes, about 34 ½ inches away from the UV lamp. Then we fertilized them and counted the percentages of fertilized eggs by using a microscope. For our second experiment, we irradiated sperm for the same lengths of time. Then we fertilized the sperm with unirradiated eggs. We then calculated the percentage of fertilized eggs. For out third experiment, we irradiated eggs for different lengths of time- 0, 5, 10, and 20 minutes. Then we fertilized the eggs with unirradiated sperm. Then we calculated the percentage of fertilized eggs.

Results

For the S.purpuratus experiments:The longer sperm cells are exposed to ultra violet light, the less successful the number of fertilization; eggs are less affected by exposure to UV light; but there was a small decline in the rate of fertilizations. Similar results were found when both gametes were exposed to UV light prior to fertilization.For the L.pictus experiments: The longer sperm cells are exposed to UV light, the less successful the number of fertilization; eggs are less affected by exposure to UV light; but there was a small decline in the rate of fertilizations. Similar results were found when both gametes were exposed to ultra violet light prior to fertilization.The L.pictus species was more sensitive to UV irradiation than the S.purpuratus species. The L.pictus species also showed a decline in fertilization rates as the gametes were exposed to UV light but the percentage of actual eggs that were fertilized was less than the percentage shown by the S.purpuratus species.

Conclusions/Discussion

We can conclude that L.pictus is more sensitive to UV light than S.purpuratus. In general,Sea urchin eggs are scarcely affected by UV light.Also, the sperm are more affected by UV light than eggs.Another study that we would recommend is to observe if the color of a certain Sea urchin species plays a role in ultra violet light protection.The next question we would pose would be #Does the pigment of Sea urchins have impact on ultra violet light protection?#

Summary Statement

We compared the fertilization rates in L. pictus and S. pupuratus when exposed to ultra violet light in different amounts of time

Help Received

Katherine Hemela, and Pam Miller