

ECHINODERM LAB ACTIVITIES

A. Prey Responses to Sea Stars

1. Collect several species of sea star to use for comparison amongst predators and several species of prey to use for comparison of prey responses. Suitable prey include mussels, barnacles, cockles, snails, limpets, and sea urchins.
2. Place each species of prey animal in a separate container with seawater.
3. Test the reaction of each prey animal to the touch of an arm tip of the sea star predator by gently holding the arm on the prey animal until a response is observed or for 1 minute (which ever occurs first). Describe any defense response observed.
4. Repeat the procedure for each species of sea star with each prey item. Any sea star-prey item combination that consistently fails to elicit a prey response should be eliminated from further testing.
5. Once you have identified those predator-prey combinations that elicit a response, use those combinations to conduct a series of tests to answer the following. Must the sea star make physical contact to elicit the response? Will only a part of the sea star (such as a tube foot) produce the same response as an entire sea star? Will the addition of sea water from a sea star container elicit a response? Is it necessary to have both the prey and the predator under water to elicit a response? What assumptions can you make about the cause of the response?

B. Sea Urchin Grazing Behavior

1. Collect a number of different types of marine macroalgae. Place the same volume of each type of alga in a separate container with seawater (using a graduated cylinder to measure volume). Set up two containers of each type of alga. In one container use plain sea water; in the other container use sea star-conditioned sea water.
2. Place one sea urchin in each container and place in a cool quiet location.
3. After 24 hours, measure and record the volume of alga remaining in each container. Continue measuring and recording the volume of alga remaining in each container until at least one treatment has resulted in a 50% reduction in algal volume. Each time you remove the alga for measurement, replace the seawater in the container.
4. Present your data in a bar graph. Is there a difference in grazing rate amongst the different types of alga? Why might there be a difference in grazing rate? Does the presence of sea star-conditioned water affect grazing rate?