|  |  |  |
| --- | --- | --- |
|  |  | |
|  | * Materials:(A) 30 gallon Fish Tank (3)- These are obviously used to house the experiment and all growth of life. These are filled with pond water to provide an already healthy community. These must also have hoods with lights. * (B) 20 gpm Pump (3)- Provides circulation for the tank to allow food, micro-bacteria, and to prevent all sediment from sinking to the bottom. Some have variable air bubble amounts that can be blown into the water. * (C) Weighted Thermometer (3)- Used to monitor temperature of all of the tanks to determine any change that isn�t intentional. * (D) Water Heater (1)- To control the temperature of the tank that is being tested for succession in adverse temperatures. It must have variable specific settings. * (E) Microscope- Used to check status of life and activity of microorganisms. You need slides and cover slips as well. * (F) PH Test Kit- To test changes in pH on a day to day basis. That is, the percent of Hydrogen ions in the water at any given time. * (G) Digital Scale- To mass the sediment and any other life in the tank to determine if there is any significant change. * (H) Aquatic Plant (9)- A small, cheap aquatic plant to provide food and succession at a larger scale than a bacterial level. 3 should be put in each take at the beginning of each test. * Procedure(1) Assemble each tank with a suction mounted pump, a hood with a light, three aquatic plants and a thermometer. (2) Place one tank outside and the other two inside. (3) Place the water heater in one of the indoor tanks. (4) Fill each tank to the top (thirty gallons). (5) Turn the temperature up to 80 degrees on the heated tank. Also, turn the light in the tank on during the day and off during the night. (6) On the second indoor tank, simply turn the light on and leave it on constantly day and night. (7) Leave the light off on the outdoor tank. (8) Turn the pumps on in all of the tanks to wherever half power is on your particular pump. (9) For two weeks log temperature, pH, and record any significant changes in the tank. (10) Draw final conclusions on the status of the tanks and whether or not the environmental change had any effect on growth of the aquatic plants and the growth of the micro-bacteria. (11) Empty all of the tanks and spray them out. (12) After they have dried, refill them and repeat the procedure several times in order to determine what is succeeding most frequently and for what reasons. * Data   **Journal**  2/1/00- All tanks are running and appear to be exactly the same. The temperature in the heated tank is slowly rising but should have little effect today.  2/2/00- The heated tank is showing the slow death of the plant. Leaves are strewn across the bottom and the pH is dropping. The other two tanks look fairly normal, with little sediment.  2/6/00- The heated tank has a great deal of sediment on the bottom of the tank and very little plant life left. There is a thin green, nerve-like substance growing in the tank. Bacterial activity is nil. The outdoor tank is thriving with life and the plants are doing very well. The fully lighted indoor tank has some sediment and plant death, but very little.  2/8/00- There is no plant left in the heated tank. The pH is dropping rapidly, and the "nerve mat" is growing very slowly on the walls. The lighted tank has a small piece of floating algae on the top that differs in structure entirely from the bottom dwelling algae that is now growing in the outdoor tank. About a quarter of the plants have died in the lighted tank and none have died in the outdoor tank.  **Nerve Mat in the heated tank shown above**  2/12/00- The mats in the heated tank are all that is left in the heated tank. Bacteria and other microorganisms are nowhere to be found. The pH has dropped severely as the temperature stays constant. The floating piece of algae in the lighted indoor tank has grown across the entire surface and all of the plants beneath it are dead. The light is not passing through the algae so all photosynthetic life is dead. There are still some microorganisms however. The outdoor tank may have actually had the aquatic plants grow. There is algae growing on the bottom, but it does not seem to interfere with the growth of the floating plants.    **The "mats of death" in the lighted tank shown above**  2/14/00- The mats are thin but spread out in the heated tank. It would be my conclusion that this species obviously thrives in warm water in low pH. There is almost no bacterial life left in the tank. The lighted tank has no plant left. The algae cover has obviously prevented the plants from photosynthesizing and has lowered the dissolved oxygen greatly. The microorganisms are still around, possibly feeding off the algae mats. The outdoor control tank, free of any restraints, has thriving plants, microorganisms, and algae all together. There is very little sediment in the bottom of the tank, so few things must have died.  **Healthy outdoor tank with lush reproducing plant life shown above.** | |
|  | |