

Geochemistry & Ecology of Red Mat Systems (GERMS)
Summer Research Program

Red Layer Microbial Observatory (RLMO)
National Science Foundation
Western Oregon University
Yellowstone National Park



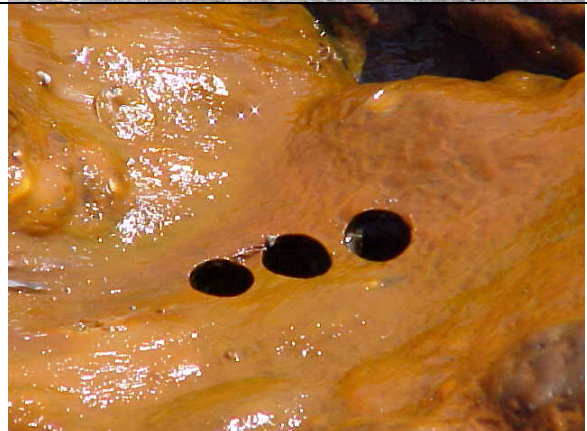
Fairy Mat GERMS Portfolio – Erin Larson, July 2007

SITE DATA AND IMAGES

Fairy Spring was rather shallow - not deep set like Upper Hillside. The hot spring didn't shoot upward very high but there were areas where it shot out rather violently. The thermal water traveled underground before emerging again at the spot that we sampled shown to the left. There was very little vegetation that grew around the pool although there was more present down stream toward Fairy Rods.



The mat was a red-orange color. The temperature was 41.3 °C and the mat pH was between 8 and 9 according to my measurements.



The core at this site was sort of difficult to work with. There were both red and green layers that needed to be separated from the other layers.



The water was 81.8°C and had a pH between 7.4 and 7.7.



ACTIVITY IMAGES

To take the pH of the water and the mat we used two different types of strips. The one used for the pH of the mat had a broader range than the one used for the water. To measure the pH of the water we inserted the strip into an area close to where the water was collected from that was later used to do the water chemistry. To measure the pH of the mat we inserted the strip into the place where the core was removed. In both cases the strip was read immediately.



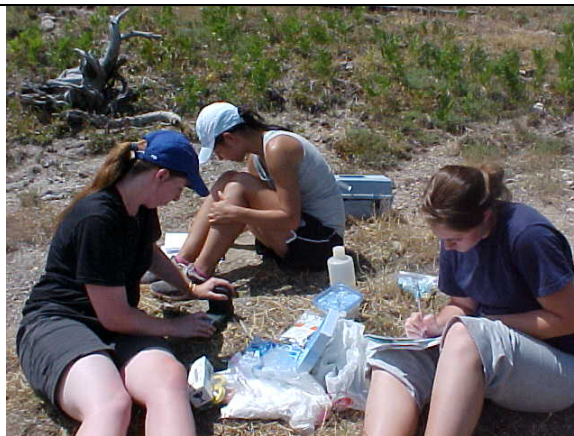
A portable thermometer was used to measure the temperature. The probe was inserted into the water and the temperature recorded. To record the temperature of the mat the probe was inserted into the mat near where the core was removed from, making sure that the probe didn't reach the rock below which would have given an inaccurate reading.



Each core sample had to be dissected apart to separate out the red and green layers. To do this the dissector used forceps and a scalpel to remove the layers that could be disposed of. After the red and green layers were cleaned up they were cut into smaller portions and placed into microcentrifuge tubes and labeled so that they can be easily accessed later for analysis.



Water from the spring was collected to test for the various elements that may be present. To do this a portable spectrometer was used. There was a set of accuvacs that contained different chemicals to check for the various elements listed below. The accuvacs had to be inverted into a small beaker of the water collected and the neck broken which allowed the water to be sucked up into the accuvac. The solutions were mixed and allowed to sit for the allotted amount of time before being inserted into the spectrometer which displayed the amount of each element present.



WATER CHEMISTRY

	Data (mg/L)
Bromine	0.06
Chlorine	0.02
Chromium	0.00
Molybdenum	0.02
Nitrate	1.70
Nitrite	0.003
Sulfate	19.0
Sulfide	0.02
Copper	0.00
Iron	0.04
Manganese	0.10