**Introduction:**
- *Cryptogramma acrostichoides* is a species of fern found in boreal climates. It only grows on acidic rock. This species can best be identified by its dimorphic leaves and similarity to parsley.
- Sky Islands isolate populations of many different species, *C. acrostichoides* being among them. The majority of *C. acrostichoides* isolated on sky islands are the populations found within the southwestern United States.
- The project is testing whether the populations found within the southwestern United States and the northwestern populations are undergoing speciation.

**Methods:**
- DNA Extraction
  - Qiagen Kit
- PCR
  - Denaturing (94°C) - This is taking the DNA strands apart.
  - Annealing (50°C) - This applies primers to the strands in order to isolate the gene sequence needed.
  - Extension (72°C) - TAQ uses the old strands to make a new helix.
- Electrophoresis
  - A 1% agarose gel was filled with PCR product and then 80-90 volts was shot through it for 30-45 minutes. This evaluated which PCR product had the best DNA.
- Sanger Sequencing
  - The PCR product was sent to the High Throughput Genomics Center for sequencing.

**Results/Discussion:**
- The results that we received are highly supportive of our goal on figuring out if *C. acrostichoides* is undergoing speciation.
- The northern and southern populations of *C. acrostichoides* have been separated into two clades based off the number of mutations found present within the plants.
- The thicker branches are highly supported by the combined PAUP and Bayesian statistics. They are shorter though, which indicates that the species is only beginning to undergo speciation.
- There is not yet proof of morphological (physical) changes within the plants. Jordan Metzgar (my mentor) will look into the issue of whether there are any morphological differences within the southern and northern populations of *C. acrostichoides*.

**Figure and Tables:**
This graph represents the PCR test results with the strongest bands (reactions).

![PCR Test Results](http://commons.wikimedia.org/wiki/File:Cryptogramma_acrostichoides_5862.JPG)

Created using the combined PAUP and Bayesian statistics.

**Conclusion:**
There is strong statistical support that the southern and northern *C. acrostichoides* populations are undergoing speciation. Further investigation is required though.

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**Citations:**