The study of speciation between Cryptogramma brunoniana and Cryptogramma raddeana

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Introduction

- **Ferns**
  - Land plants
  - Reproduce using spores
  - Mostly found in rainforests
  - 30 feet long to 1 inch in size
- **Cryptogramma**
  - Grows on acidic rocks
  - Looks like parsley
  - Dimorphic leaves (sterile and fertile)
  - Brown’s parsley fern and Radde’s parsley fern
  - Occurs in Eastern Asia (China and Russia)
  - Grows on acidic rocks in high elevations

Research Question

- Are C. brunoniana and C. raddeana two different species?

Materials and Methods

- DNA extractions
  - Qiagen Kit
- Polymerase Chain Reaction (PCR)
- Denature (94°C)
  - The splitting of the double helix into two separate strands
- Anneal (50°C)
  - Application of the primers to the desired gene area
- Extension (72°C)
  - Thermus Aquaticus (Taq) applies the dNTPs onto the separated single strands
- Repeat 35X
- Gel
  - 1% agarose gel quantifies the plant DNA
- Sequencing
  - PCR templates and primers were sent to High Throughput Genomics Center in Washington University for sequencing.
  - Sequences of each strands were put together for quality control.
- Phylogeny
  - Analyzed with Maximum Parsimony and Bayesian and put together to create Figure 1.

Discussion

- They are different species because
  - C. brunoniana is in a different clade from C. raddeana (figure 1).
  - C. brunoniana and C. raddeana are morphologically different.

Citations


Jordan S. Metzgar, Robert W. Marcotte, Allyson Wukovich, Roberta G. Walker, BioPrep, University of Fairbanks

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