

Genetic Variation and Speciation in Alaskan *Claytonia*

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Picture 1: *C. sarmentosa* found at 12 mile, near Eagle



Picture 2: *C. scammaniana* found at Eagle Summit.

Introduction:

Claytonia L., commonly known as Spring Beauty, is a small flower found all over Alaska. This flower plays an important role in the environment, providing a food source for wildlife and people. However there has been controversy over whether or not certain *Claytonia* flowers are of one species or another. To resolve this, samples of *Claytonia scammaniana*, *C. sarmentosa*, and *C. eschscholtzii* were collected, as well as others. The goal of this project is to create the phylogenetic tree of the *Claytonia* species. We are going to use the genetic markers at103 and sqd1. These loci will then be compared and the species will be determined.

Methods:

- 20 DNA samples: *C. scammaniana*, *C. sarmentosa*, *C. eschscholtzii*, *C. noatakensis**, and *C. porsildii*
- extracted with DNeasy Plant kit
- Genetic markers: at103 and sqd1
- PCR and Sanger sequencing
- Sequences aligned with Sequencher and Mesquite
- DNA Analyzed and trees created with Paup* and RAxML
- *putative new species

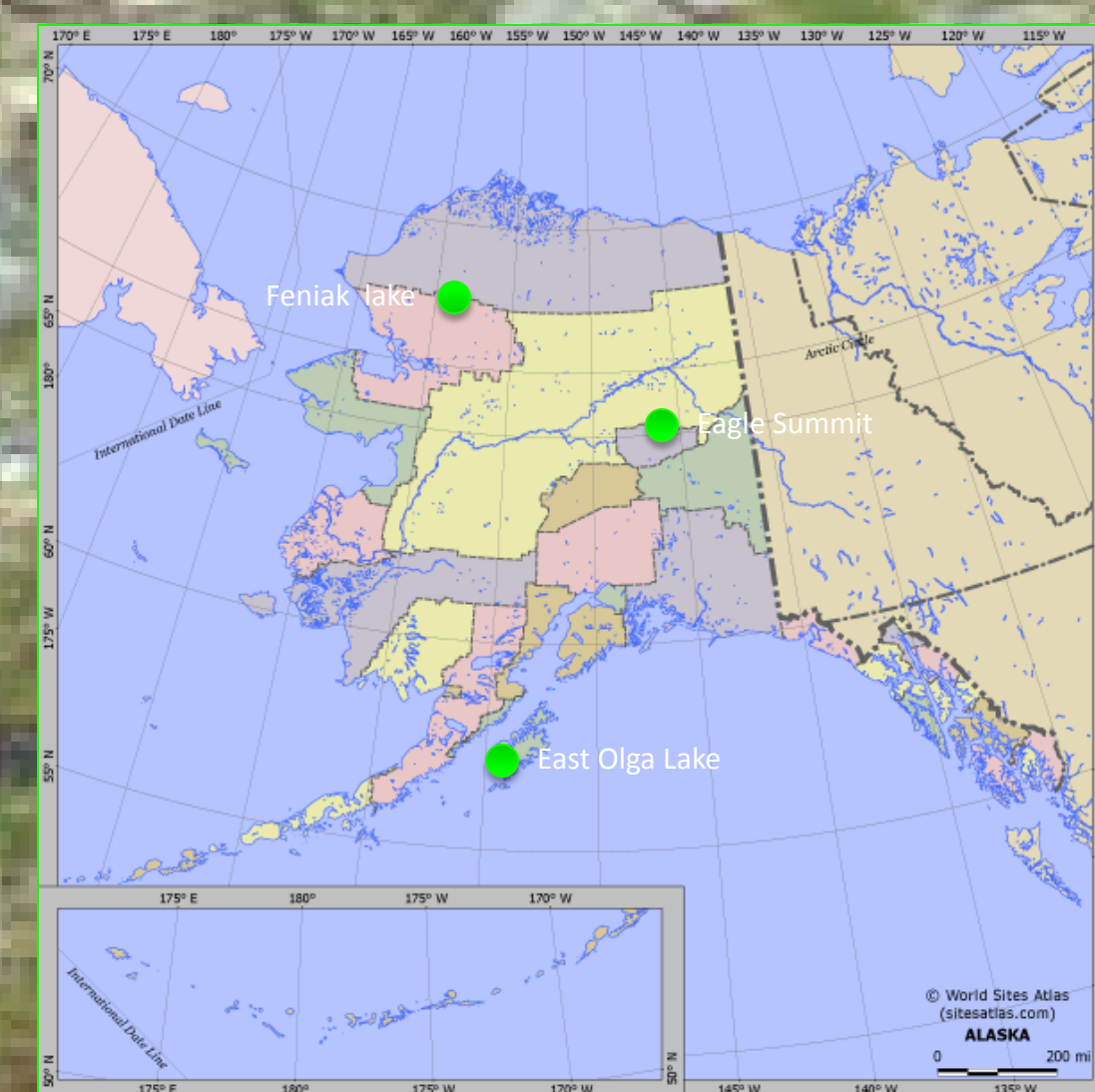
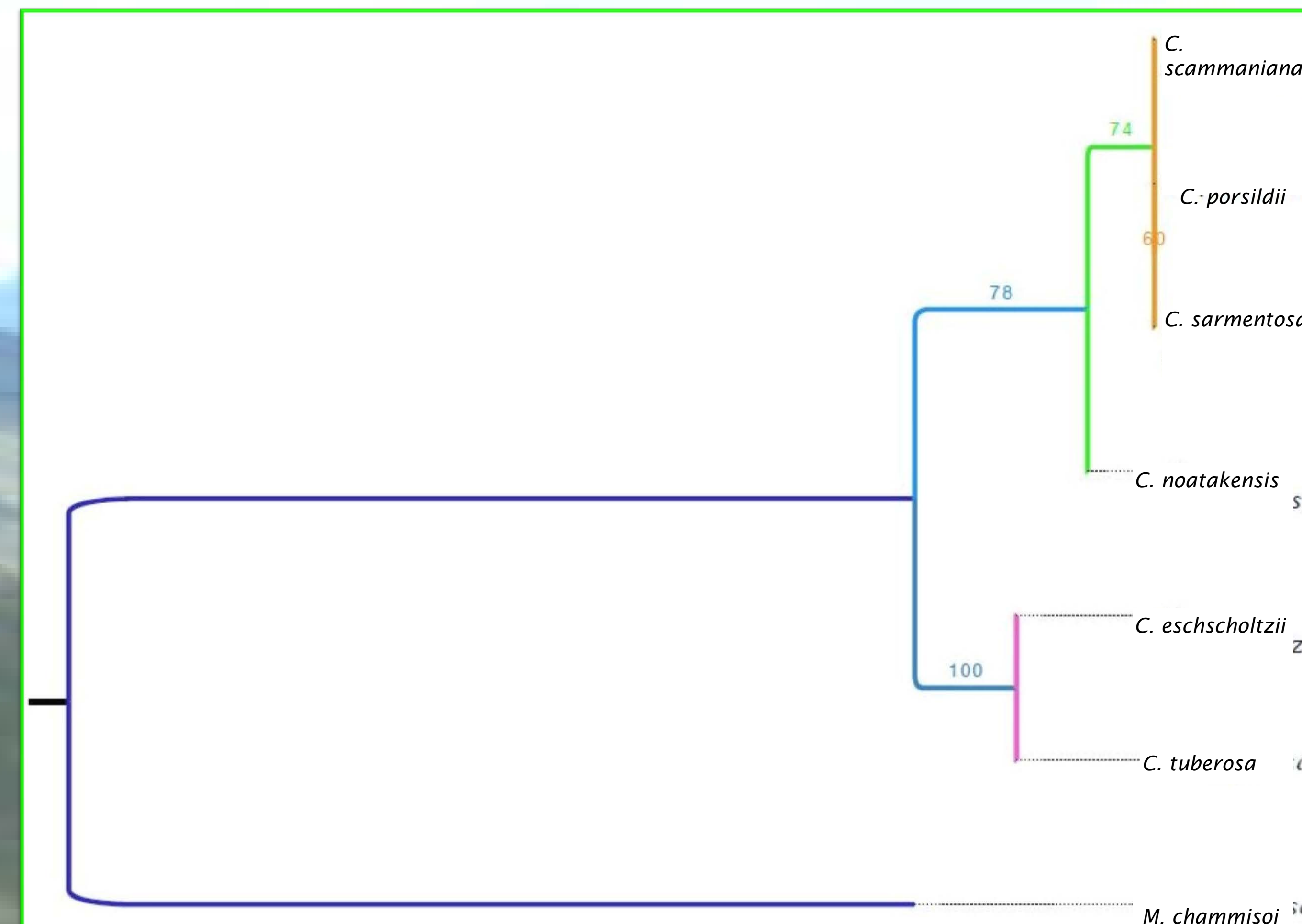


Figure 3: Diagram showing the locations of where our specimens were collected.



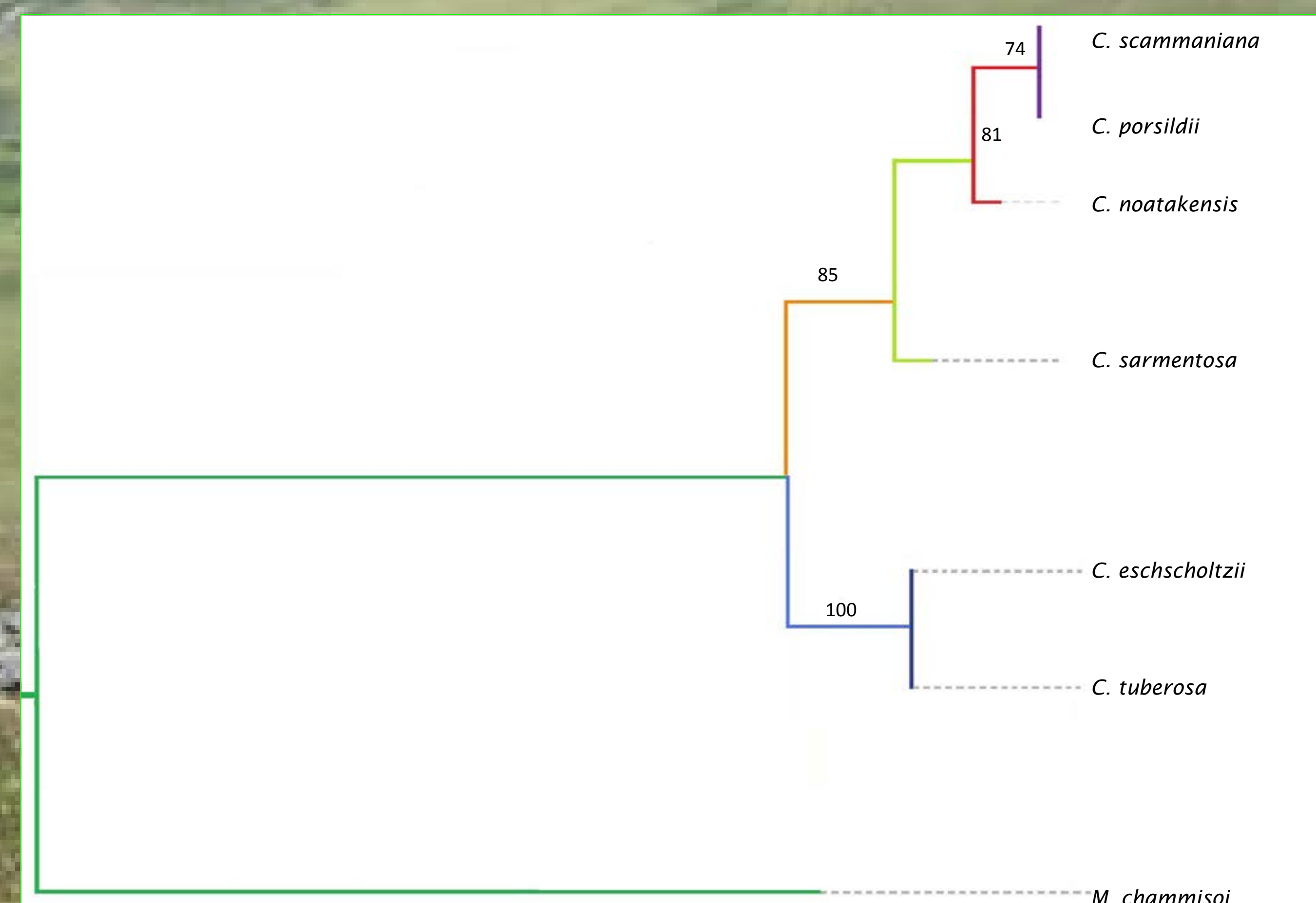
Picture 3: *C. tuberosa* found at 12 mile, near Eagle Summit.



Results:

Figure 1(top middle): Maximum likelihood tree showing bootstrap values - the sequences used in this particular tree were from sqd1 and *Montia chammisoi* was used as the root.

Figure 2(bottom middle): Maximum likelihood tree consisting of the same species but using at103 as the marker. *Montia chammisoi* was also used as the root here



Discussion:

We found that *C. tuberosa* and *C. eschscholtzii* are more closely related to each other than the others. While on the other clade *C. scammaniana*, *C. sarmentosa*, *C. porsildii* and *C. noatakensis** share appear to share a common ancestor. These relationships were reflected in both trees with the different markers, providing further support for these relationships. While the precise relationships between the *C. scammaniana* clade are not as supported and could use further resolution, separation from the clade containing *C. tuberosa* is well supported and provides some resolution within Alaskan species. Further repetition would be able to provide more evidence of this.

