

NORTHWEST NAZARENE UNIVERSITY

## Abstract

**Bioinformatics and DNA barcoding is a** process used to identify plants, animals, and fungi. DNA barcoding in plants utilizes a key variable region in the genome, the RuBisCo large subunit (RbcL) on Chloroplast DNA. Once the DNA is extracted, Polymerase Chain Reaction (PCR) amplifies that region and that sample is sent off for sequencing. Bioinformatics and DNA barcoding helps taxonomists determine the sequence of the RbcL gene as well as obtain a unique barcode that can be used to identify plants.



### **Background Information**

There are about 400,000 known plant species in the world. Nearly all coniferous plants have been identified, however one-fifth of all vascular plants and an unknown amount of algae remains unnamed.



DNA barcoding and bioinformatics lets scientist identify the species. DNA barcodes are cataloged on the Barcode of Life Database (BOLD), as well as Basic Local Alignment Search Tool (BLAST), which helps analyze, store, and publish records. Using the DNA sequence extracted and these databases we could verify the names of the sample species



## **Goals:**

- Master the processes of Polymerase Chain Reaction, DNA barcoding and bioinformatics
- Determine whether the *Carolina* genomic protocol or the Wizard genomic protocol is more efficient
- Use the processes mentioned above to identify campus plant biodiversity.



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Figure 3-Data Table including DNA barcodes and names for the RbcL gene of the plants

# **Bioinformatics in**



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*blina* genomic protocol was more efficient than the enomic protocol.

s DNA wasn't extracted using one protocol, the sufficient to extract the DNA.

gene varied enough across species to identify

of plants were identified across the Northwest University campus.

not identified as the DNA was not extracted ully from it. There was a waxy layer on the leaf, xtraction difficult.

## usion

barcoding with the use of RuBisCo large subunit Chloroplast gene was highly successful.

barcodes could be with previous 23S rRNA 16S rRNA ons on the BLAST \_16S rRNA s allowing us to Chloroplast genome in a liverwort (121,024 bp) lant species. 🚬 — tBNA Trp esearch can help t Nazarene RUBISCO (large subunit) identify more **t**RNA<sup>T</sup> campus.

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apman. 2009. Numbers of Living Species in nd the World.2nd edition. Australian Government, of the Environment, Water, Heritage and the Arts. ustralia.

rcode Generator

w DNA barcoding can boost quality control for nt products. 2015.

## wledgments

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