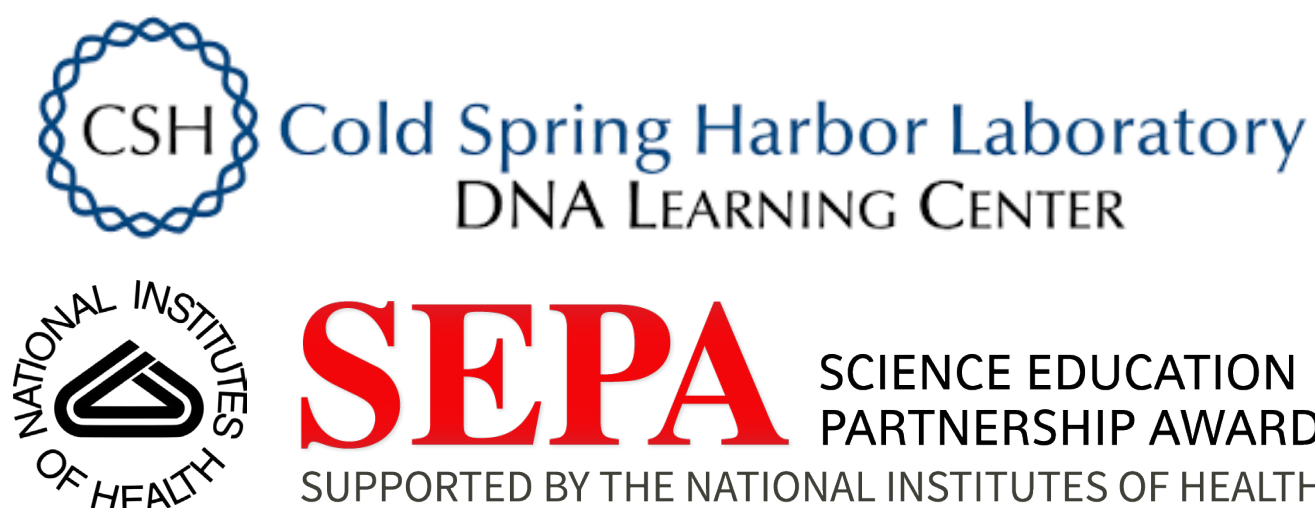


# Ant Biodiversity at the Avalon Nature Preserve

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## Abstract

One of the most abundant animals in the world, ants play a significant role in organic waste decomposition, soil nutrition, plant health, and seed dispersal. The purpose of this study is to determine the distribution of ant biodiversity in a meadow surrounded by forests. A pitfall trap will be used to attract ants. In this study, the authors hypothesize that ant biodiversity will be relatively low in and on the perimeters of the barn, and gradually increase with some proportion to distance as the location gets farther away from the barn.

## Introduction

Ants are involved in a variety of ecologically significant processes, such as soil aeration, seed dispersion, and organic waste decomposition, which help maintain the ecosystem in balance<sup>[1]</sup>. Ant biodiversity is thus related to the status of the ecosystem, attracting much interest from researchers. The purpose of this research is to assess the biodiversity of ants in “natural” locations with low human activity by collecting ants at fixed locations within the Avalon Nature Preserve, a natural conservation area with trails.

## Materials & Methods

### Sample Collection & Preparation

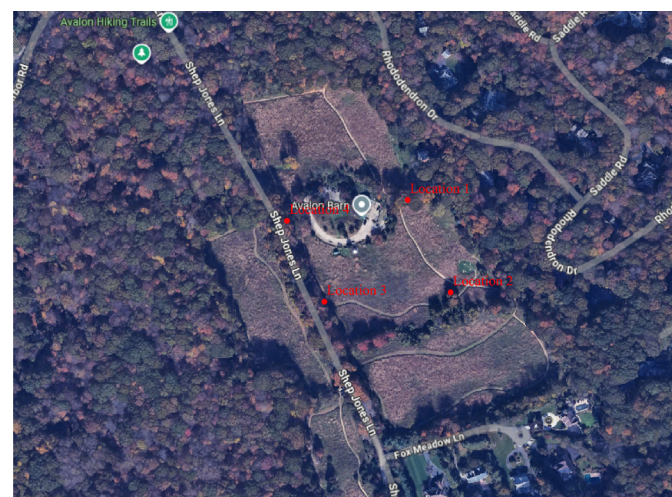


Figure 1. A map of Avalon Park, showing the location of collection sites #1 to #4.

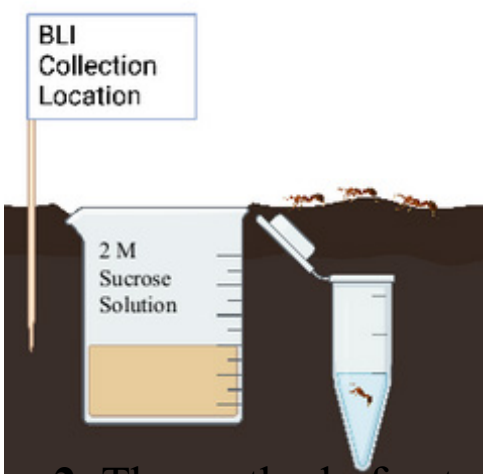


Figure 2. The method of ant collection (pitfall trap)<sup>[2]</sup> adapted from the Natural History Museum. Samples stored in ethanol.

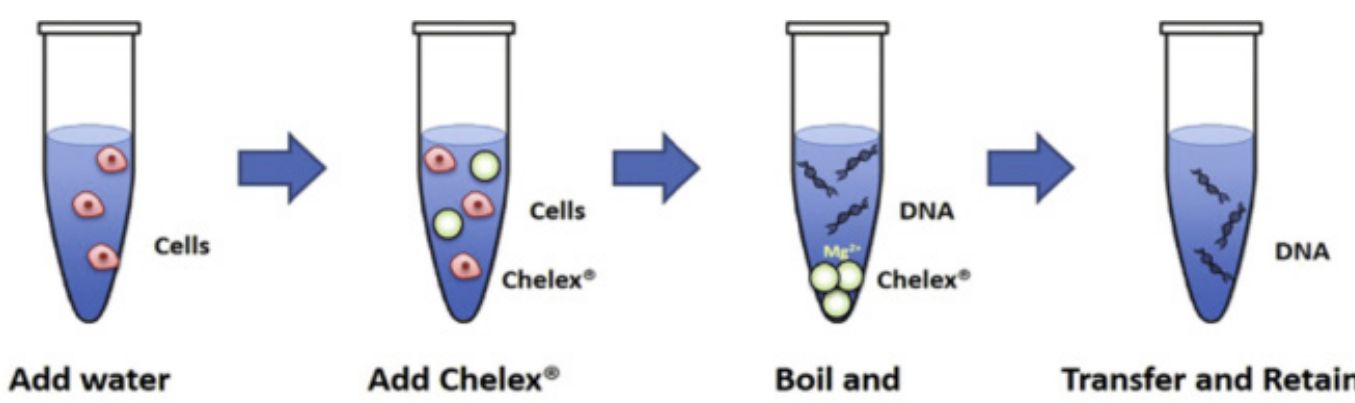


Figure 3. Chelex resin was used for DNA isolation, following protocols as described by CSHL’s “Using DNA Barcodes to Identify and Classify Living Things” booklet. Image from “DNA Isolation by Chelex Method”<sup>[3]</sup>.

### DNA Isolation

### DNA Amplification & Gel Electrophoresis

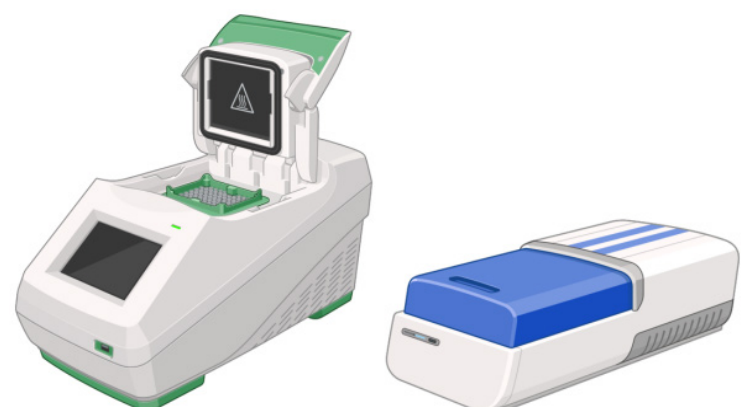
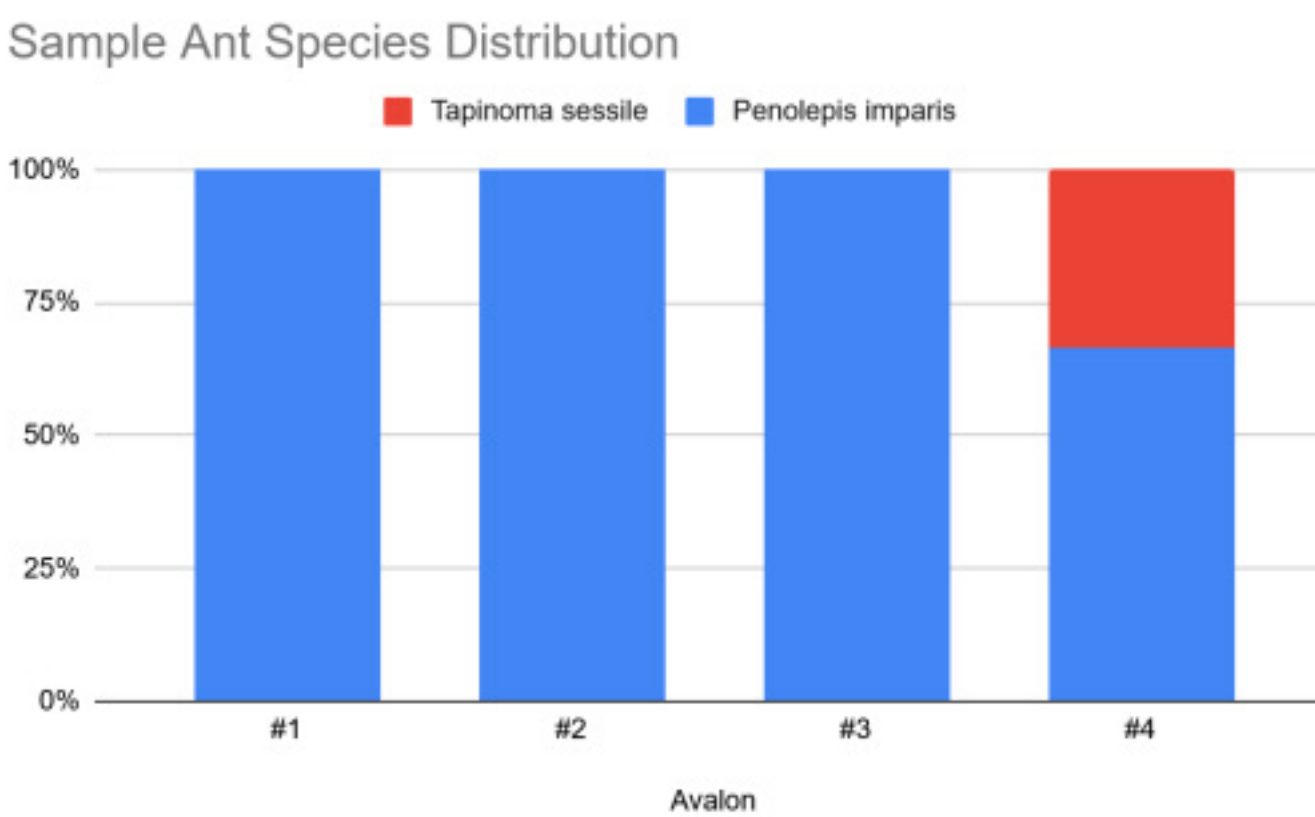
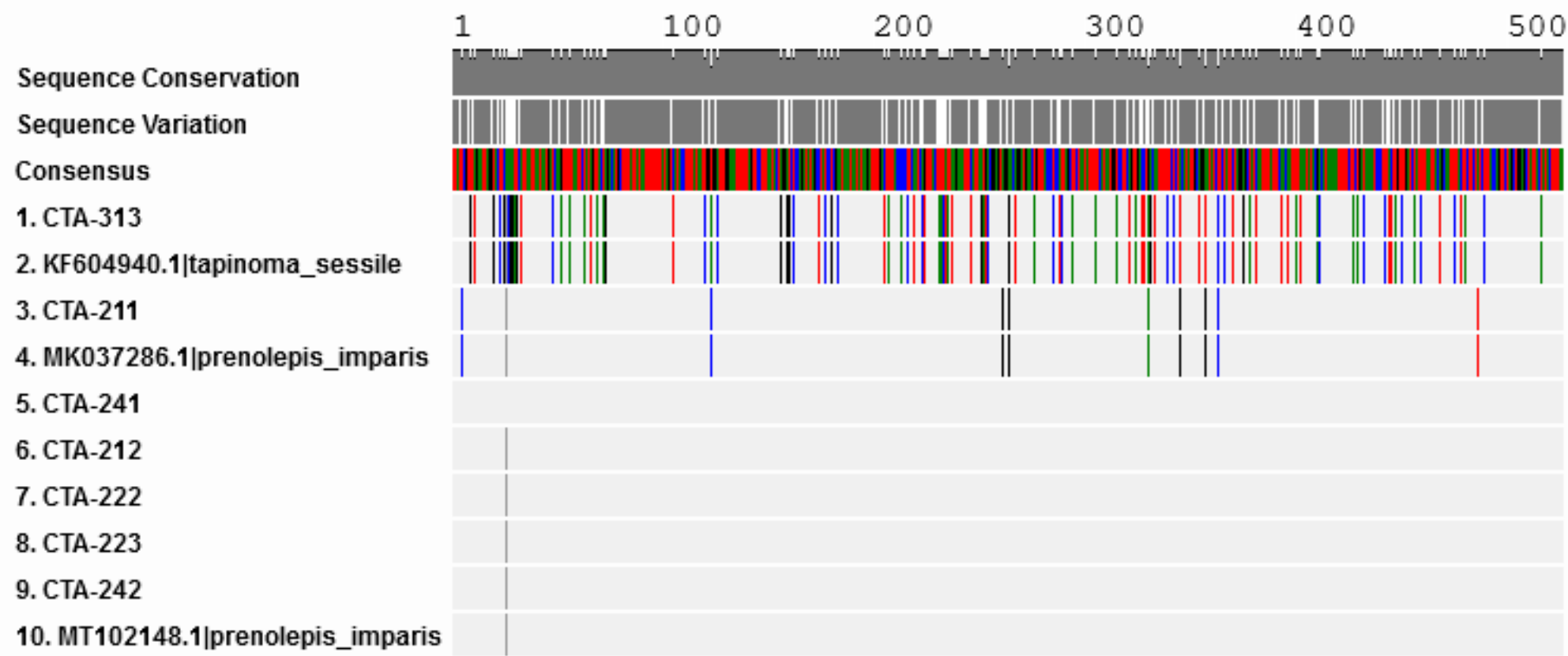


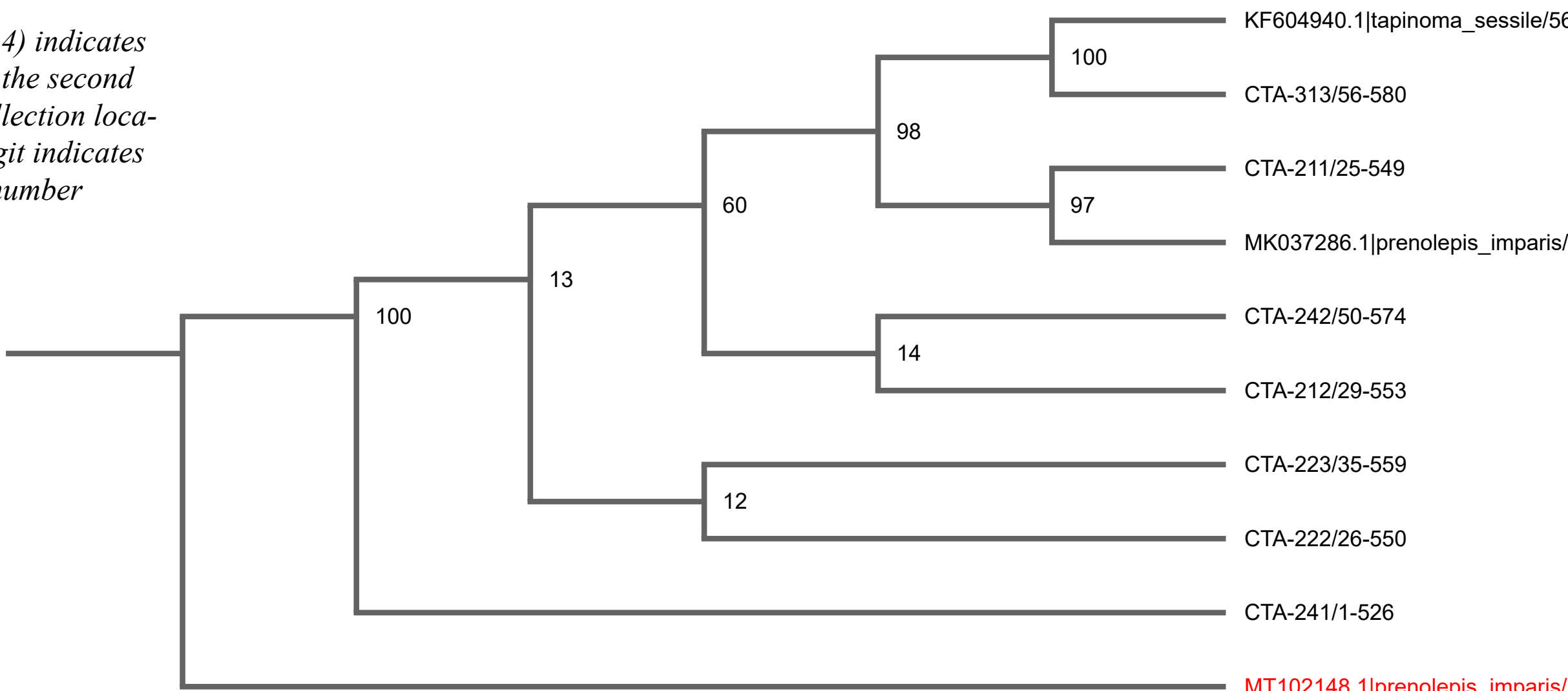
Figure 4. The target gene, CO1, was amplified by PCR with a BioRad thermocycler. The product was ran through gel electrophoresis.

## Results



Code	Species
CTA-211	<i>Prenolepis imparis</i>
CTA-212	<i>Prenolepis imparis</i>
CTA-222	<i>Prenolepis imparis</i>
CTA-223	<i>Prenolepis imparis</i>
CTA-241	<i>Prenolepis imparis</i>
CTA-242	<i>Prenolepis imparis</i>
CTA-313	<i>Tapinoma sessile</i>

The first digit (1-4) indicates collection date, the second digit indicates collection location, the third digit indicates individual number



## References

1. Ants Are Ecologically Beneficial. (n.d.). Yard and Garden. Retrieved May 26, 2024, from <https://yardandgarden.extension.iastate.edu/encyclopedia/ants-are-ecologically-beneficiala>

2. How to make a pitfall trap to catch insects and other minibeasts. (n.d.). Retrieved May 26, 2024, from <https://www.nhm.ac.uk/discover/how-to-make-pitfall-trap-to-catch-insects.html>

3. Gautam, A. (2022). DNA Isolation by Chelex Method. In A. Gautam (Ed.), DNA and RNA Isolation Techniques for Non-Experts (pp. 79–84). Springer International Publishing. [https://doi.org/10.1007/978-3-030-94230-4\\_10](https://doi.org/10.1007/978-3-030-94230-4_10)

## Acknowledgements

This research used materials and thermocyclers from the Office of Educational Programs at Brookhaven National Laboratory. The authors would like to acknowledge the help and support of staff of the Office of Educational Programs at Brookhaven National Laboratory, Cold Spring Harbor DNA Learning Center, and the Stony Brook School.