The Biodiversity of Myriapods in Westchester County, NY

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Abstract

- Myriapods are invertebrates in the subphylum Myriapoda
- They aid in soil enrichment by decomposing organic matter, often welcomed by gardeners
- This study aims to assess Myriapod species diversity in Westchester County, New York
- Identification methods included field guides, iNaturalist, and DNA Barcoding
- Thirty samples were identified with field guides and logged into iNaturalist
- DNA Barcoding was used to verify identifications, revealing two species in total

Introduction

- Myriapods encompass roughly 13,000 species across four classes: *Chilopoda* (centipedes), *Diplopoda* (millipedes), *Pauropoda*, and *Symphyla*
- These classes fulfill distinct roles in their ecosystems
- Millipedes serving as decomposers, aiding in the nutrient cycle
- Centipedes act as carnivores, regulating insect populations
- Myriapods contribute to soil enrichment through organic matter decomposition
- Despite their ecological importance, there's limited understanding of myriapod biodiversity, motivating studies like this one in Westchester County, New York
- Focused on millipedes and centipedes, the study aims to illuminate their presence in the Westchester County, NY, contributing to broader knowledge of myriapods' ecological impact

Materials & Methods

•Thirty Myriapod samples were collected in January and February 2024, with 17 from Rye Brook, New York, and 13 from New Rochelle, New York.

•Samples were found in dirt, beneath broken tree bark, overturned rocks, moist soil, and dead leaves.

•Identification involved stereoscope observation and pictures taken under stereoscope, uploading images to iNaturalist, comparison with field guides like BugGuide and the Ohio Field Guide, and assistance from Dr. Hennen.

•DNA extraction and amplification were performed using COI primers at the Regeneron DNA Learning Center, followed by gel electrophoresis and sequencing.

•Results were analyzed using DNA subway/BLAST and compared with field guide and iNaturalist identifications.

Table 1. Myriapod species found in Rye Brook and New Rochelle

Rye Brook	New Rochelle
2.1 *Cylindroiulus punctatus*	3.1 *Cylindroiulus punctatus*
2.2 *Armadillidium nasatum*	3.2 *Lithobius melanops*

Figure 2.1

Figure 2.2

Figure 3.1

Figure 3.2

Results

- DNA Barcoding results were inconclusive for most collected specimens
- Identification relied on Dr. Hennen's expertise and resources like BugGuide and the Ohio Field Guide

Tables & Figures

Figure 1. The map of Westchester county, NY, and the locations of collection (Rye Brook and New Rochelle

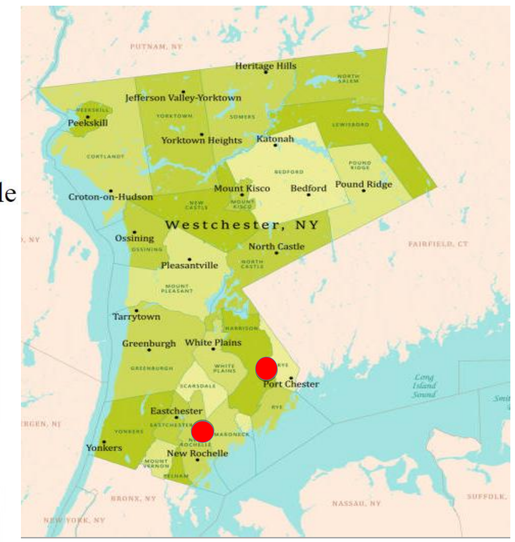

Table 2. Myriapod species found in Rye Brook and New Rochelle

Collection Site	DNA Barcoding Identification Success	Species Identified
Rye Brook	2 *out of* 17	*Cylindroiulus punctatus*, *Armadillidium nasatum*
New Rochelle	6 *out of* 13	*Cylindroiulus punctatus*, *Lithobius melanops*

Discussion

Goal: Evaluate Myriapod biodiversity in Westchester County

- Collected high volume of *Cylindroiulus punctatus*
- Remaining results inconclusive, limiting assessment
- Implication of *Cylindroiulus punctatus* as most abundant species, potentially inaccurate due to lack of data
- Lack of data possibly due to improper PCR procedures
- Guts removal for DNA extraction not feasible due to Myriapod size (0.5mm-2mm)
- Only 8 out of 30 our specimens were successfully identified to species in DNA subway/BLAST
- iNaturalist identification: Blunt-tailed Snake Millipede, Furry Snake Millipede, Common Pill Woodlouse, Barrel Millipedes
  - Majority of collection comprised of millipedes, suggesting their abundance in Westchester county in winter months.
- Field guides indicate common species: *C.caeruleocinctus, C. punctatus, Ophyiulus pilosus*
  - One centipede found: *Lithobius melanops*
- Six specimens of *Cylindroiulus punctatus* confirmed through BLAST, along with one *Lithobius melanops* and *Armadillidium nasatum*

•Limitation: Lack of Westchester-specific field guide

•Continued research crucial for understanding myriapod abundance and role as decomposers in Westchester ecosystem

References

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