

Overt or Undercover? Investigating the Invasive Species of Beetles on Long Island

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Abstract

Our goal was to analyze the biodiversity of beetles in Valley Stream State Park to identify native and non-native species using DNA Barcoding. PCR was performed on viable samples to amplify DNA to be barcoded via DNA Subway. After barcoding, it was concluded that only two distinct species of beetles were collected, many of the remaining species being different variations of woodlice.

Introduction





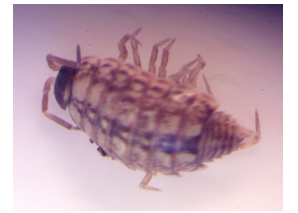

Beetles are the largest group of animals on earth, with more than 350,000 species. It is important to document species of beetles due to an increase in invasive species that may harm the environment. We set out to measure the diversity in the population of beetles in Valley Stream State Park in terms of non-native and/or invasive species. It was inferred that the population of non-native and invasive species would outnumber the population of native species.

Materials & Methods

- 21 Samples were collected at Valley Stream State Park with a quadrat, pitfall trap, and bark beetle trap
- DNA was extracted from samples, and PCR and gel electrophoresis were conducted
- The CO1-gene of viable samples were sequenced and identified through DNA Barcoding

Results

- 2 native beetle species were identified: *Melanotus communis* (common wireworm) and *Agriotes oblongicollis* (click beetle). *Melanotus communis* are soil-dwelling larvae of *agriotes oblongicollis*.
- 9 samples of *Philoscia muscorum* (common striped woodlouse), 1 sample of *Porcellio scaber* (common rough woodlouse), and 1 sample of *Oniscus asellus* (common woodlouse) were identified upon DNA Barcoding.
- 1 sample of *Parcoblatta uhleriana*, also known as Uhler's wood cockroach, was collected.

Sample Number	Species (Best BLAST Match)	Number Found	Specimen Photo
PKN-003	Porcellio scaber (common rough woodlouse)	1	
PKN-004	Oniscus asellus (common woodlouse)	1	
PKN-009	Melanotus communis (wireworm)	2	
PKN-011	Agriotes oblongicollis (click beetle)	1	
PKN-019	Philoscia muscorum (common striped woodlouse)	9	
PKN-020	Parcoblatta uhleriana (Uhler's wood cockroach)	1	

Discussion

- 11 samples were identified as woodlice, all of which are native to Europe, but have spread globally. 3 species native to the U.S. were identified.
- These species pose no threat to humans, but some may be regarded as pests.
- Collection errors: Many samples were perceived as beetles due to their hard shells. Many were later identified as woodlice, a type of crustacean arthropod.
- Future research may aim to collect a wider abundance and variety of samples, with a focus on the morphological definition of a beetle.

Acknowledgements

Thank you to Brittany Johnson for guiding us through our research process and welcoming us into the DNA Learning Center. We would also like to thank Jason Williams for sharing his knowledge and experience with us. Finally, thank you to the CSH Laboratory and SEPA for making this event possible.

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Figure 1. Log Habitat

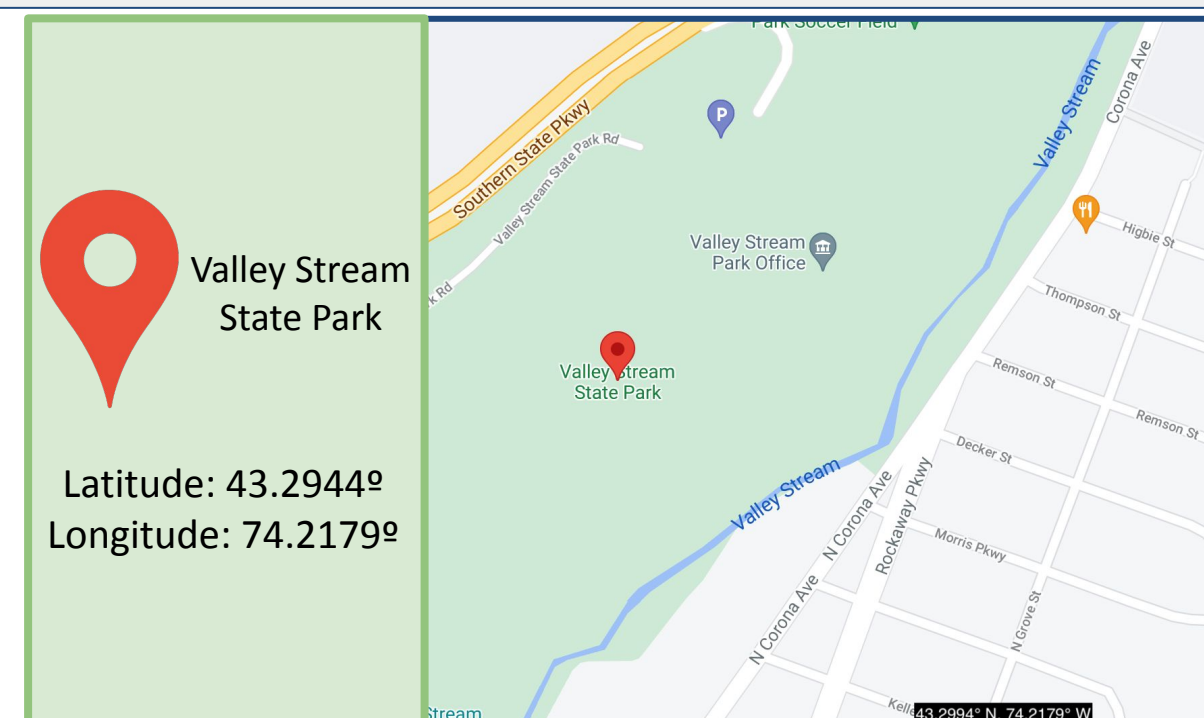


Figure 2. Map of Valley Stream State Park



Figure 3. Leaf Habitat