



Beetle Diversity at Long Beach High School

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DNA Barcoding

Abstract

- Long Island is a unique environment containing a large diversity of organisms.
- Beetles are critical components of most terrestrial ecosystems. They are the most diverse group of animals on the planet.
- We trapped various species of beetles around our school's garden area.
- The main goal of our project is to distinguish each beetle and its appropriate species. Our goal is to better understand beetle diversity in our area.
- BLI protocol will allow us to sequence the COI gene and match that to a reference database to ID the species.

Methods

- Seven species were collected using the pitfall trap and the Japanese beetle traps. Soil was sifted to find beetle larvae
- We were unable to ID the species taxonomically. DNA barcoding was carried out on all of the collected specimens. Two successful barcodes were obtained using BLI protocol.

Results

- BLAST results identified two distinct species:
 1. *Aeloderma brachmana*
 2. *Conoderus lividus*

Phylogenetic Tree



Image 2:
Aeloderma brachmana
Photo Taken By Researchers



Image 1:
This shows that two of the beetles have a common ancestor.



Image 3:
Conoderus lividus
Photo Taken By Researchers

Discussion

Our results are important because we discovered a rare species that is not native to New York or the United States. We found a beetle by the name of *Aeloderma brachmana* which is native to Japan and Eastern Asian countries. We found out that it is a rice pest and it most likely got to the United States through a rice shipment. Potential issues with this beetle is that they may become a pest of agricultural crops in the U.S., specifically rice. This could adversely affect crop production. It may lead to increased pesticide use and therefore adversely affect human health. Because rice is a native grass in the U.S. there may be other adverse effects to native grass species by this introduced insect. It has the potential to become an invasive species. *Conoderus lividus* is native to the U.S. and is considered a pest for peanut plants and other groundnut plants.

References

Litsinger, J.A., et al. "Upland Rice Insect Pests: Their Ecology, Importance and Control." *UPLAND RICE INSECT PESTS: THEIR ECOLOGY, IMPORTANCE, AND CONTROL*, Jan. 1987, pp. 1–41. *IRRI RESEARCH PAPERS*, ag.udel.edu/delpha/6958.pdf.

Barcode of Life Data System www.boldsystems.org/index.php/databases

Raczkowski, J. M., and G. M. Luque. "Colony Founding and Social Parasitism in *Lasius* (Acanthomyops)." *Insectes Sociaux*, vol. 58, no. 2, 2010, pp. 237–244., doi:10.1007/s00040-010-0141-y.