

Biodiversity of Wantagh Park

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Abstract

Our team collected different species of invertebrates from two locations in Wantagh Park to investigate how variations in human activity levels impacted the biodiversity of invertebrates. We studied one area near a playground where there is heavy foot traffic and another area that is surrounded by water where there is minimal human interaction. Two types of traps were set up at each location to collect samples. DNA was then extracted from the invertebrates and the *COI* gene was amplified to identify each sample species. The number of different species between the two areas was then compared. We hypothesized that a higher rate of biodiversity will be found near the water because less human interference will allow more species to thrive and grow and found that there was no impact on biodiversity from human interaction.

Results

We found that human interference did not impact biodiversity, both areas showed high levels of species diversity. We found that samples 2, 16, and 17 were all Alaskan fire ants (*Myrmica americana*). Sample 4 is a common pill ant (*Armadillidium vulgare*). Sample 5 was found to be a pavement ant (*Tetramorium caespitum*). This ant is in the same sub-family as the fire ant. Sample 6 was found to be a true bug (*Hemiptera*). Sample 20 was found to be a yellow-striped army worm (*Spodoptera ornithogalli*). We found biodiversity within Wantagh Park, however there was no impact from human interaction.

Discussion

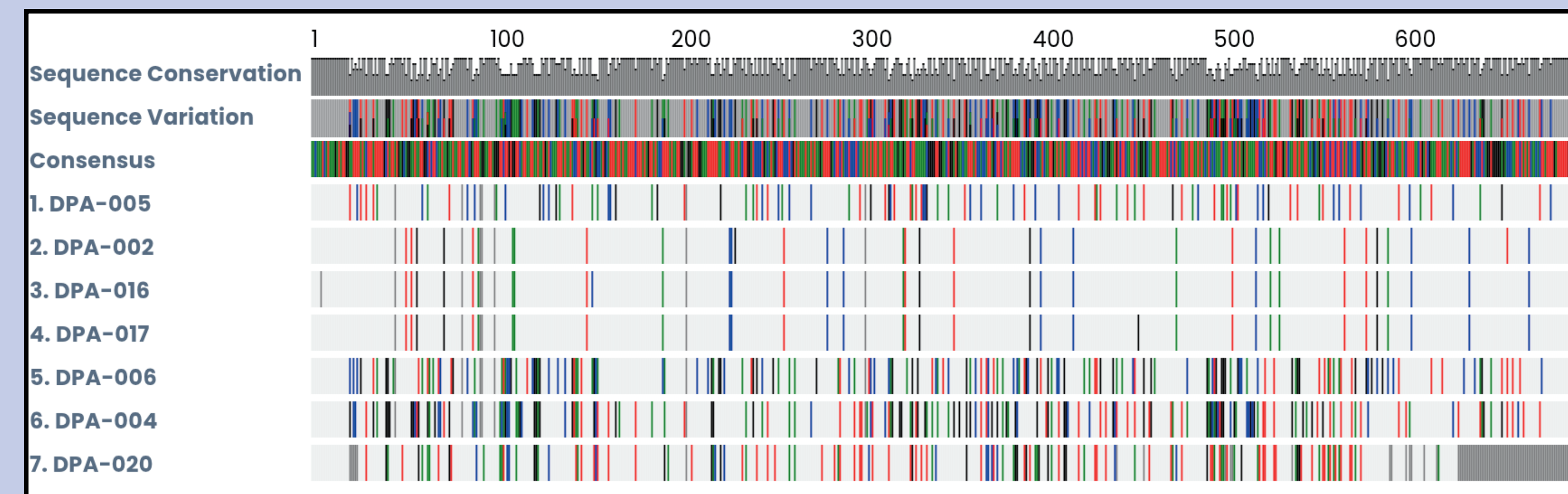
The results above respond to our previous hypothesis, proving it to be incorrect. These findings mean that there is no impact of human activity on biodiversity of the area. Consequently there is an even distribution of biodiversity throughout Wantagh Park. Moving forward, another experiment should be conducted on the biodiversity in the area. This should be conducted without the limitations and difficulties presented throughout the experimentation process of this study. New adaptations that can be studied include a conduction of this experiment in which the research is not limited to the autumnal season, is able to be carried out over a longer course of time, and/or with a larger amount of available resources including more chelex, test tubes, water baths and centrifuges.

Introduction

Wantagh Park has a wide range of locations varying from grassy areas and playgrounds on one end to a creek along the other. Moreover, there are many types of invertebrates in the park, such as ants, spotted lantern flies, and spiders. We hypothesized the different levels of human activity will impact the biodiversity of invertebrate species in the park due to environmental disturbances, such as residue and garbage people leave which may attract or repel certain species. Likewise, we chose to study the effect of human activity because insects are a primary food source for many species, serving as decomposers. Consequently, because there are insufficient information about the ways human activity affects insect biodiversity (Messner, n.d., 2021), contrasting the playground and the waterfront park areas provides a relationship between invertebrate species and human interactions where it is crucial to acknowledge the relation they have between each other. Furthermore, we chose these two locations as we did because one is in a location with heavy human foot traffic, and the other area experiences less human activity. The location of the park was chosen because it preserves the environment, and most invertebrates live in environments where there is no infrastructure. With human-built infrastructure in the area, such as pavements, playgrounds, lamps, gazebos, parking lots, and restrooms, the biodiversity is impacted by the removal of its natural habitats.

Materials & Methods

We collected invertebrates that vary to investigate how variations in human activity levels impact the biodiversity of invertebrates. We studied one area near a playground where there was heavy foot traffic and another area that is surrounded by water where there was minimal human interaction. Furthermore, we used the app iNaturalist to document the different invertebrates. Then, with the sample of different invertebrates collected, we inserted each sample into a tube containing chelex and then grounded the samples. The tubes were then heated in a water bath for 10 minutes to facilitate the DNA extraction. Next, the tubes were placed in a centrifuge to separate the contents to create a pellet. The liquid portion containing the DNA was transferred to new tubes, which were placed in a thermal cycler for DNA amplification. Then, we used a sample from each of these tubes for analysis through gel electrophoresis. When the gels confirmed the *COI* gene had been amplified, the corresponding samples were then sent off for sequencing. Moreover, for data analysis, we used DNA Subway to identify our samples to common insects.



References

Messner, Ella. *Dropping like Flies: Human Threats to Insects and the Desperate Need for More Data* – NU Sci Magazine. <https://nuscimagazine.com/dropping-like-flies-human-threats-to-insects-and-the-desperate-need-for-more-data/>. Accessed 20 Oct. 2025.

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