Biodiversity of Woodlice in Central Park
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Abstract
Woodlice were collected from seven different areas in Central Park to determine the relationship between human activity and species diversity. About 30 woodlouse samples were collected and their DNA was extracted and sequenced in order to determine their species identification. We hypothesized that woodlouse samples extracted from areas with less human disturbance would exhibit more biodiversity than the samples taken from areas with more human disturbance due to woodlice exerting more energy when disturbed. Our results did not support our hypothesis because the biodiversity in both areas was fairly similar.

Table 1. Species Identification of Collected Woodlice. This table contains the scientific and common names of species collected in Central Park as identified by BLAST analysis of the DNA barcode of woodlouse samples, as well as the number of each species collected.

<table>
<thead>
<tr>
<th>Latin Name</th>
<th>Common Name</th>
<th>Invasive/Native</th>
<th>Number of Species</th>
</tr>
</thead>
<tbody>
<tr>
<td>Philoscia muscorum</td>
<td>Striped woodlouse</td>
<td>invasive</td>
<td>11</td>
</tr>
<tr>
<td>Hyloniscus riparius</td>
<td>Woodlouse</td>
<td>invasive</td>
<td>6</td>
</tr>
</tbody>
</table>

Table 2. Simpson’s Biodiversity in Areas with Varying Amounts of Human Disturbance. Woodlouse species were found in Central Park and identified by sequencing. Two different species were found and they were repeated throughout the five different locations in the park. The five locations included under the canopy, by the fence, under a rock, under a bush, and near sunny leaves. Five samples were collected by the fence, which was the location with the most human disturbance. Under the canopy, under a rock, under a bush, and near sunny leaves were the places with the least human disturbance, where 12 samples were collected. Simpson’s Biodiversity (1/D) was calculated to compare biodiversity at areas with more or less human disturbance.

Discussion

- We hypothesized that woodlouse samples extracted from areas with less human disturbance would exhibit more biodiversity than the samples taken from areas with more human disturbance due to woodlice exerting more energy when disturbed.

- Our hypothesis was not supported by Simpson’s biodiversity index which was:
  - 1.9 for areas with more human disturbance and
  - 1.8 for areas with less human disturbance.

- We found fewer samples in the area with less human disturbance.
  - 12 woodlice from areas with limited human disturbance
  - 5 woodlice from areas with more human disturbance.

- Only two woodlouse species were identified:
  - 11 Philoscia muscorum
  - 6 Hyloniscus riparius.

- Increasing the number of samples would improve the reliability of the data of the effects of human disturbance on the samples of woodlouse.

- In the future, it would be beneficial to collect samples from areas with measured human disturbance including:
  - measured amounts of pollution, pesticides, and overcrowdedness.

- Improve biodiversity of woodlouse by:
  - Reducing pesticide, herbicide, and fertilizer use
  - Reducing the clearing of leaves
  - Creating areas in Central Park with limited human disturbance.

Materials and Methods

- 30 samples were collected from different areas of the Bridle Path in Central Park.
- DNA was isolated using chelex and amplified using PCR with invertebrate COI primers.
- Gel electrophoresis to confirm PCR amplification
- 17 were successfully identified
- Sequencing by Azenta
- Sequence analysis through BLAST

References

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