The Effects of Invasive Rubus phoenicolasius and Celastrus orbiculatus on Soil Chemistry in Two Staten Island Urban Forests
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Introduction
The 2800 acres of Staten Island’s Greenbelt parks are the largest remaining forest preserves in New York City. Unfortunately, invasive plant species, introduced either intentionally or unintentionally, pose threats to the ecological health and structure of these urban forests. The mechanisms by which invasive species establish themselves remains unclear but may be related to chemical changes created in the soils around invasive species.

Problems Associated With Invasive Plants
- Reduce biodiversity
- Promote extinctions
- Alter habitats
- Change the structure of the forest
- Interfere with nutrient cycling

Research questions:
- Will soil chemistry of native and invasive plant species differ?
- Will soil chemistry differ between invasive species?

Materials and Methods
- iNaturalist phone app was used to confirm the plant species before soil sampling.
- A soil sampling probe, to a depth of 7 inches, was used to obtain six samples from the soil surrounding each of six wineberry plants and six nearby native plants; and six bittersweet plants and six nearby native plants.
- The soil sampling probe was cleansed between the sampling of each species with a cloth dampened with water, followed by a vigorous spray, inside and outside, with 70% alcohol.
- The six soil samples from each plant species were placed in a labeled plastic storage bag and mixed gently by hand agitation.
- All soil samples were stored in a refrigerator until tested.
- The LaMotte soil test kit was used to analyze the soil around each plant for pH, K, P, N.

Discussion/Conclusions
- Soil K was higher in the oriental bittersweet category. Oriental bittersweet may exert a difference on soil K between itself and nearby native and invasive plants.
- The wineberry soils were more alkaline than their nearby native plants, although it was not a significant difference (p= 0.248425).
- All soils in the four categories showed depletion of P and N; therefore, it might not have been possible to determine the effects of plant invasions.
- Since only mature plants were included in this study, the impacts of plant invasions may have lessened over time.
- It is possible that factors other than changes in soil chemistry facilitate the success of invasive species.

References:
1. Morgen, Masovaida, (2020) Staten Island’s parks are one of New York City’s best kept secrets. lonelyplanet.com