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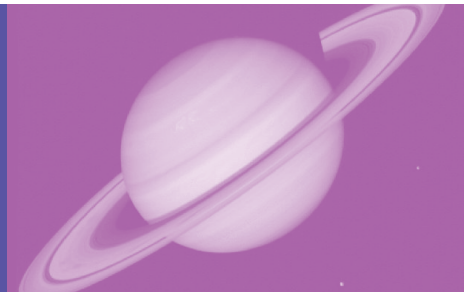

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Editorial

The purpose of the *Science and Technology Undergraduate Research Notes (SATURN) Journal* is to provide a venue for publication of undergraduate research. This research may include any novel findings of note while providing an opportunity for undergraduates to experience dissemination of their findings to the scientific community. Our goal is for the *SATURN Journal* to serve as both an educational and research tool. Each publication in this issue of the *SATURN Journal* has been reviewed by the professor for the course and by an outside scientist.

Worthwhile data from embedded research in laboratory course curricula can be disseminated to the world community. By contributing their own novel findings for the greater good, students can be engaged in science through embedded research pedagogy more than through conventional pedagogy, and a source of large scale cataloging information can be developed by many students contributing novel data.

The *SATURN J.* Tree Survey pedagogy is an ongoing, cost competitive method of including embedded research in a non-majors science course, and has been successfully implemented at SCCC since the Spring Semester of 2012. It easily fits into the curriculum of contemporary *Principles of Biology* non-major science courses. Also, it has evolved into an instructed, crowd sourcing method for research that can readily be adopted by other institutions. This pedagogy has the capacity to provide valuable and long term undergraduate research experience nationwide.

The *SATURN J.* began its' first issue with students from a Principles of Biology class at Suffolk County Community College (SCCC) in New York contributing their findings from a research project embedded in the laboratory curriculum. Specimens of each tree found on residential properties were brought to class. The species of each tree was identified by using a traditional dichotomous key. Students collaborated in groups to develop hypotheses based on the locations of the properties where the trees were found, the distribution of species, circumferences of trunks and population densities. The students followed the instructions for authors at the web site for the *SATURN Journal* (www.saturnjournal.org), and submitted their manuscripts to their instructor who acted as a peer reviewer. Those students whose manuscripts were accepted upon revision received a grade of 'A' and were given extra credit for the revision and publication. This has been a cost effective exercise that has resulted in enthusiastic student engagement, and is building a catalogue of the distribution of tree species on residential properties in Suffolk County, New York. There was also a publication in this issue by a group of students who were enrolled in a statistics course. They compared the growth rates of different cultivars of the American Elm (*Ulmus Americana L.*) planted on campus at SCCC.

In the second issue of the *SATURN Journal* there was a continuation of student publications pertaining to the embedded research project analyzing tree species distribution. Students found it helpful to compare their findings to the findings of student investigators who have published previously in the *SATURN Journal*, which resulted in citations of previously published students.
The second issue also contained publications from a research project embedded in a microbiology course from which students reported their findings from tests of the antimicrobial properties of spices.

In the third issue of *SATURN J.* there was continuation of research projects that produced publications in the previous journals. New publications compared findings to a larger battery of previously identified trees. Students used the web site from the United Stated Geological Survey (www.usgs.gov) to report the latitude and longitude of properties included in the studies. Additional web based tools

used by students included online dichotomous keys such as vTree at Virginia Tech located in Blacksburg, Virginia (http://dendro.cnre.vt.edu/dendrology/idit.htm).

The fourth issue of *SATURN J.* included an article published by students at Molloy College regarding sweeteners and inflammation in macrophages, three additional articles from the microbiology course at SCCC, and a continuation of the *SATURN J.* tree survey. In addition, the abstracts from the 2014 Northeast Regional Sigma Xi Conference held at SUNY Old Westbury were presented.

In this fifth issue of the *SATURN Journal* we are happy to present an additional article from the microbiology course at SCCC that compares soil bacterial communities on Long Island, and multiple articles that continue the *SATURN J.* Tree Survey.

We encourage instructors to have their students participate in the *SATURN Journal*. The publications in the journal are a source of embedded research project designs that instructors may include in their curricula. The journal serves as a venue for dissemination of student research and a source for students to compare their work to the work of others. Instructors are welcome to design additional projects from which their students can submit manuscripts.

Louis Roccanova, Ph.D.
Editor in Chief
SATURN Journal

Non-Native Tree Species Outnumber Native Tree Species found on Four Residential Properties in Deer Park, East North Port, Amityville, and Bay Shore in Long Island, New York

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Keywords: Dichotomous key, Long Island, Native trees, Non-native trees, Suffolk County

Abstract: A total of fifty tree samples were gathered from four residential properties in different parts of Suffolk County in Long Island, New York. Sampling locations included nine samples collected from Amityville, twenty-five samples collected from East Northport, six samples collected from Deer Park, and ten samples collected from Bay Shore. By using dichotomous keys, each tree species was identified based on the tree's specific characteristics such as but not limited to size, shape, texture, color, leaf structure. The tree species where divided in two categories, native species and non-native to the North Eastern United States, by using outside internet web pages and the cellular application "Leafsnap". A total of nineteen non-native tree species to North Eastern America were identified while ten native tree species to North Eastern America were identified. Findings suggest that the planting of non-native tree species on residential properties outnumbers the planting of native tree species.

Introduction: Long Island is home to many species of trees that are both native and non-native to this region. A native tree is defined as a tree that arrived, established, and survived in a specific region without the use of direct or indirect assistance from humans (Morse et al. 2015). A non-native tree requires assistance from humans in order to successfully arrive, establish, and survive in a specific region (Morse et al. 2015). According to The Virginia Department of Forestry (2015), there are many reasons why identifying trees can be helpful to one's community and the environment. Tree species may provide information regarding the soil the tree is growing in or the climate conditions of a specific area. Being able to identify and distinguish native and non-native trees is important. Native trees have adapted and evolved in an environment for an extended period of time with the competing species, predators and diseases of a given area. This creates ecological balance within the environment. Non-native trees tend to alter habits in an ecosystem and push native trees and animals. They have not adapted and evolved with the native species of a given area for an extended period of time and may therefore dominate an area (Morse et al. 2015). In this study, a total of fifty branches were collected from different trees, with a total of twenty-nine different species identified, from residential properties in Deer Park, Amityville, East Northport, and Bay Shore.

Methods: In order to conduct this experiment, branches from each tree on four residential properties in Long Island were gathered. Information regarding the location at which each tree sample was found including town, latitude and longitude coordinates and elevation of the property were identified by using the website veloroutes.org. This data was then verified using the website usgs.gov. A total of fifty tree samples were collected from four areas of Suffolk County: Deer Park, East North Port, Bay Shore, and Amityville. After the samples were gathered and brought into the laboratory, a series of Dichotomous keys were used to identify the types of trees found. The "Tree Finder Booklet" (Watts 1998) was first used to identify the species of the trees collected. In order to verify the trees that were classified and to classify the trees that could not be classified using the "Tree Finder Booklet" by Watts (1998), "A Field Guide to Eastern Trees" (Petrides 1998) and the smart phone application "Leafsnap"

(Columbia University, University of Maryland, Smithsonian Institution 2011) were utilized. Internet sources were used to determine whether or not the tree species collected were in fact native or non-native to the North Eastern United States.

Results: Based on the data collected, on four residential properties on Long Island, trees not native to North Eastern America outnumber trees native to North Eastern America. Of fifty tree samples collected from four residential properties, only nineteen were native species while the remaining thirty-one were non-native species. In other words, this means that of the total twenty-nine different tree species identified, nineteen non-native tree species were found and the remaining ten tree species were found to be native.

Table 1: Property Locations used for Sample Collection

Deer Park, New York	Amityville, New York	East Northport, New York	Bay Shore, New York
Latitude: 40.7716340 Longitude: -73.3423930	Latitude: 40.6928670 Longitude: -73.4041763	Latitude: 40.8728140 Longitude: -73.2888890	Latitude: 40.7756290 Longitude: -73.2640869
Elevation: 82 feet 25 meters	Elevation: 42 feet 13 meters	Elevation: 154 feet 47 meters	Elevation: 101 feet 31 meters

Table 1 provides information pertaining to the four locations by which the tree samples were collected, identified, and compared in order to conduct this experiment.

Table 2: Identification of Samples found on East North Port Property

Common Name	Scientific Name	Quantity on Property	Native vs. Non-Native
Northern Red Oak	*Quercus rubra*	4	Native
Norway Maple	*Acer platanoides*	5	Non-Native
London planetree	*Platanus × acerifolia*	1	Non-Native
Downy Oak	*Quercus pubescens*	5	Non-Native
Arborvitae	*Thuja*	6	Native
Common Lilac	*Syringa*	2	Non-Native
Dog Wood	*Cornus*	1	Native
Judas Tree	*Cercis siliquastrum*	1	Non-Native

Table 2 provides information involving the species of trees found on a residential property in East North Port, the scientific name of the tree species found, the quantity of samples collected of each tree species, and whether the trees collected were native or non-native to the North Eastern United States. According to the results, it was found that of the twenty-five tree samples collected at this location, eleven of the samples were found to be native to North Eastern United States while fourteen of the samples were found to be non-native to North Eastern United States.

Table 3: Identification of Samples found on Bay Shore Property

Common Name	Scientific Name	Quantity on Property	Native vs. Non-Native
Box Elder Maple	*Acer negundo*	1	Native
Eastern Red Cedar	*Juniperus virginiana*	1	Native
Weeping Willow	*Salix babylonica*	1	Non-Native
Scotch Elm	*Ulmus glabra*	1	Non-Native
Tree of Heaven	*Ailanthus altissima*	1	Non-Native
European Larch	*Larix decidua*	1	Non-Native
Japanese White Pine	*Pinus parviflora*	1	Non-Native
Green Hawthorn	*crataegus*	1	Native
Silver Maple	*Acer saccharinum*	1	Native
Japanese Maple	*Acer palmatum*	1	Non-Native

According to the results, it was found that of the ten tree samples collected at this location, four of the samples were found to be native to North Eastern United States while six of the samples were found to be non-native to North Eastern United States.

Table 4: Identification of Samples found on Deer Park Property

Common Name	Scientific Name	Quantity on Property	Native vs. Non-Native
Norway Maple	*Acer platanoides*	1	Non-Native
Japanese Maple	*Acer palmatum*	1	Non-Native
Black Pine	*Pinus nigra*	1	Non-Native
Cherry Plum	*Prunus cerasifera*	1	Non-Native
Japanese Snowbell	*Styrax japonicus*	1	Non-Native
American Sycamore	*Plantanuc occidentialis*	1	Native

According to the results, it was found that of the six tree samples collected at this location, only one sample was found to be native to North Eastern United States while five of the samples were found to be non-native to North Eastern United States.

Table 5: Identification of Samples found on Amityville Property

Common Name	Scientific Name	Quantity of Samples	Native vs. Non-Native
Back Locus	*Robinia pseudoacacia*	1	Native
Phoenicean Juniper	*Juniperus phoenicea*	1	Non-Native
English yew	*Taxus baccata*	1	Non-Native
Aleppo pine	*Pinus halepensis*	1	Non-Native
London planetree	*Platanus × acerifolia*	1	Non-Native
Sycamore maple	*Acer pseudoplatanus*	1	Non-Native
European silver fir	*Abies alba*	1	Non-Native
American Red Oak	Quercus rubra	1	Native
Balsam Fir	*Abies balsamea*	1	Native

According to the results, it was found that of the nine tree samples collected at this location, three of the samples were found to be native to North Eastern United States while six of the samples were found to be non-native to North Eastern United States.

Discussion: Unless specifically noted, the information below is derived from the "Leafsnap" application (Columbia University, University of Maryland, Smithsonian Institution 2011).

Out of the twenty-five tree samples that were gathered from East North Port, eleven samples were native to Long Island while fourteen tree samples were non-native. The Norway Maple *(Acer platanoides)* originates from Europe; the London Plane (*Platanus × acerifolia)* is native to Spain and is a hybrid made from the American sycamore (*Platanus occidentalis*) and the Oriental plane (*Platanus orientalis*) (SelecTree-), the Common Lilac (*Syringa)* originates from the Persian Empire to Europe, and the Judas Tree (*Cercis siliquastrum)* originates from the Mediterranean (Salyards 2015).

Similarly, out of the ten tree samples that were gathered from a residential property in Bay Shore, only four tree species were found to be native to Long Island while six tree species were found to be non-native to North Eastern America. Trees that were found to be non-native to this area include Weeping Willow (*Salix babylonica)* as it originates from China, Scotch Elm (*Ulmus glabra)* as it originates from Europe, European Larch (*Larix decidua)* as it originates from Northern Europe, Tree of Heaven (*Ailanthus altissima*) as it originates from China, Japanese White Pine (*Pinus parviflora)* as it originates from Korea, and Japanese Maple (*Acer palmatum)* as it originates from Japan, Korea, and China.

The trend of non-native tree species outweighing the native tree species that are found on residential properties in Long Island continues as five of the six samples of tree species found on a property in Deer Park were identified as non-native to the area. For instance, Norway Maple *(Acer platanoides)* originates from Europe, Japanese Maple (*Acer palmatum)* originates from Japan, Korea, and China, Black Pine (*Pinus nigra)* originates from the Mediterranean, Cherry Plum (*Prunus cerasifera),* and Japanese Snowbell (*Styrax japonicas).*

Lastly, on a residential property in Amityville, three tree species were identified as native while six tree species were identified as non-native. The non-native trees on this property were identified as Phoenicean Juniper *(Juniperus phoenicea),* which originates in the Costal Mediterranean (Farjon 2013), English Yew *(Taxus baccata),* which originates in Britain (2015), Aleppo Pine *(Pinus halepensis),* which originates in Asia, Europe, and Africa (European Union 2014), London Plane (*Platanus × acerifolia),* which originates from London and is a hybrid made from the American sycamore (*Platanus occidentalis*) and the Oriental plane (*Platanus orientalis*) (SelecTree-), Sycamore Maple (*Acer pseudoplatanus),* which originates from Europe, and European silver fir (*Abies alba),* which originates from Mountainous regions of Europe.

Conclusion:

Among the fifty different tree species that were identified on the various Suffolk County locations, it has been found that the number of non-native tree species found on residential properties on Long Island appear to be greater than native tree species of Long Island found on these properties. European native trees, such as the Scotch Elm and the Norway Maple, and Japanese native tree species, such as the Japanese Maple and the Japanese White Pine, were more commonly found than trees that were native to Long Island and the United States, such as tree species that included Dogwood and the American Red Oak. Other non-native trees species that were commonly found in the Long Island area include the Weeping willow, a Chinese native tree species, the Juniperus Phoenicia and the Black Pine, Mediterranean native tree species, were also commonly found. In addition, the Platanus X hispanica mill tree species was found to be a cross bred of two different tree species, the American Sycamore and the Oriental Plane.

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Comparative Characterization and Analysis of Soil Bacterial Communities on Long Island, N.Y.

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Keywords: Soil, Bacteria, Antibiotic, Colony Morphology, Cell Morphology, Bacilli

Abstract

The purpose of this study was to determine if there are differences between the naturally occurring bacterial communities found in soil samples from western and eastern Long Island, N.Y. Soil samples were taken from distinct geographic locations, Brentwood and Hampton Bays. Serial dilution and gram staining were performed in order to analyze colony morphology and cell morphology. Soil testing was also performed to gather information about each soil sample's specific pH. Both Brentwood and Hampton Bays had colonies specific to their unique location and soil type. A colony surveyed from the Brentwood sample was found to be producing an antibiotic substance. Single bacilli were commonly observed in both samples.

Introduction

Soil is the naturally occurring loose mineral and organic matter that makes up the earth's outer surface (Paul, 2007). Life abounds in soil, with an exceptionally high density of living organisms (Singh *et al*., 2012). Variant life forms such as bacteria, fungi, protozoa, and nematodes colonize soil and add to its ecological diversity (Singh *et al*., 2012). Microorganisms are critical to soil quality and health. They are responsible for processes such as organic matter decomposition, carbon cycling, and nitrogen cycling. This enables plants to better uptake the necessary nutrients and sustain a broad ecologically healthy food web (Shah *et al*., 2011). Bacteria comprise the most abundant life group found in soil. Factors such as soil type, pH, organic matter content, and moisture content influence the type of bacteria present based on geographical location (Abdulkadir *et al*., 2012). Bacteria have evolved to survive in soil, which can at times be a variable environment. For example, the wide spread soil bacteria, genus *Bacillus* can produce endospore to resist long periods of desiccation and limited access to vital nutrients to ensure survival (Singh *et al*., 2012). Ecological interactions also take place in soil and can lead to competition between the microbes present. When various bacterial communities use the same substrate and nutrient sources competition for survival is prevalent (Singh et al., 2012). For this reason soil microbes commonly produce antibiotic metabolites to inhibit the growth of other species nearby. The genus *Bacillus* can produce many different types of antibiotics. For example, *Bacillus licheniformis* produces the antibiotic bacitracin which is effective against gram positive bacteria. The genus *Streptomyces* is another soil dwelling bacteria that produces numerous antibacterial substances that are used in medicine today (Abdulkadir *et al*., 2012). Due to the high frequency of prokaryotic genetic variability, new antibiotic substances are always needed to treat pathogenic microbes that have become resistant to known treatments and this is one of the reasons soil ecology and microbial populations are important to study and understand (Tyc *et al.*, 2014)

The purpose of this study was to determine colony morphology and cell morphology of the bacterial species present in different geographical locations on Long Island, N.Y. Two soil samples were surveyed to see if any differences existed in soil bacterial populations of western and eastern Long Island. Soil was collected from Brentwood and Hampton Bays, N.Y. Brentwood is inland and the area sampled from was dry and near a large population of rose bushes. Conversely, Hampton Bays is between two bodies of high saline concentration bay water. The soil was sampled from a shady, wet

area with tree and clover growth.

Methods and Materials

Two soil samples were collected using sterile Petri dishes from both Hampton Bays (Sample 1) and Brentwood (Sample 2). The Hampton Bays sample, representing eastern Long Island, was collected from a shady open field (Latitude 40° 51’ 35.00” N, Longitude 72° 31’ 4.00” W). The soil collected was observed to be sandy, moist, and easily clumped. The Brentwood soil sample, representing western Long Island, was collected near rose bushes (Latitude 40° 46’ 49.00” N, Longitude 73° 15’ 24.39” W). The soil was observed to be dense, earthy, and dry. Both soil samples were collected in March 2015.

The soil samples were then diluted, using the serial dilution method, up to 1:10,000 (Harley, 2014). The four levels of dilution, 1:10, 1:100, 1:1,000, and 1:10,000, were then inoculated onto Trypic Soy Agar (TSA) and MacConkey Agar plates. The plates from each sample were then incubated at 30°C for 24 hours. After incubation, the bacterial growth on the plates was examined. The colony morphology was observed and noted. Gram staining was performed using the isolated colonies found on the plates. Endospore staining was also performed for the specific colony seen to have endospore within its vegetative cells.

Further soil testing was performed to gather information specific about each sample using the Rapitest Soil Test Kit. Using the included test materials, the soil pH was evaluated. The Brentwood soil was found to be alkaline, dark green in color, indicating a pH of 7.5. Conversely, the Hampton Bays soil was found to be slightly acidic, yellow-green in color, indicating a pH of 6.5 to 7.0.

Results

Colony 3 (Figure 1) was from the Hampton Bays sample diluted to 1:1,000 on TSA. The colony was filamentous and flat in elevation, with growth within the agar as well. After gram staining it was observed that the colony was made up of gram positive streptobacilli (Figure 1a). The chains observed were very long, made up of at least chains of eight. Colony 9 (Figure 2) was obtained from the Brentwood sample diluted to 1:1,000 on TSA. The colony was filamentous and flat in elevation. Its growth near colony 13 was observed to be inhibited. Gram staining showed the colony to be made up of gram positive streptobacilli (Figure 2a). The chains observed were very long. Colony 4 (Figure 3) was from the Hampton Bays sample diluted to 1:1,000 on TSA. The colony was whitish with a dull surface. The entire colony was round with irregular margins. Gram staining of this colony showed gram positive bacillus (Figure 3a). Mostly single cells and a few diplobacilli were seen. Endospore staining showed numerous endospores within the vegetative cells throughout the sample (Figure 3b). Colony 5 (Figure 4) was obtained from the Hampton Bays sample diluted to 1:100 on TSA. The colony was observed as bright yellow pinpoint, with convex elevation. After gram staining, the cells were seen to be gram negative bacillus (Figure 4a). Mostly single cells and diplobacilli were seen. The cells were long and thin.

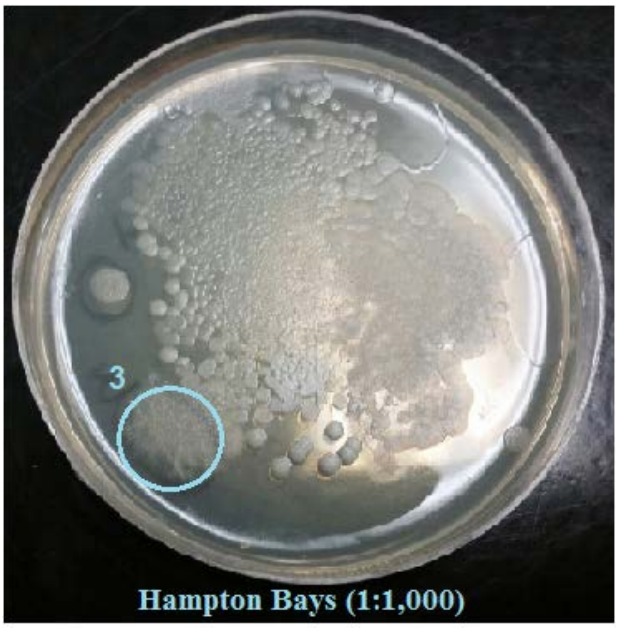

Figure 1: Hampton Bays Sample, Colony 3 (1:1,000).

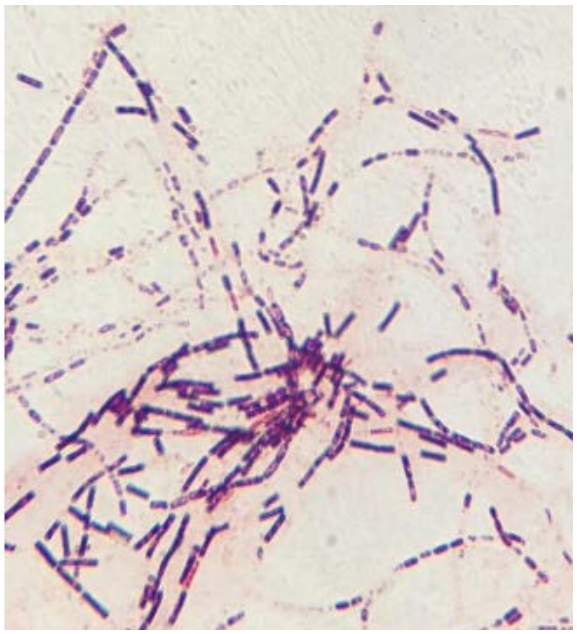

Figure 1a: Hampton Bays Sample, Colony 3 Gram Staining (1000X).

Figure 2: Brentwood Sample, Colony 9 (1:1,000).

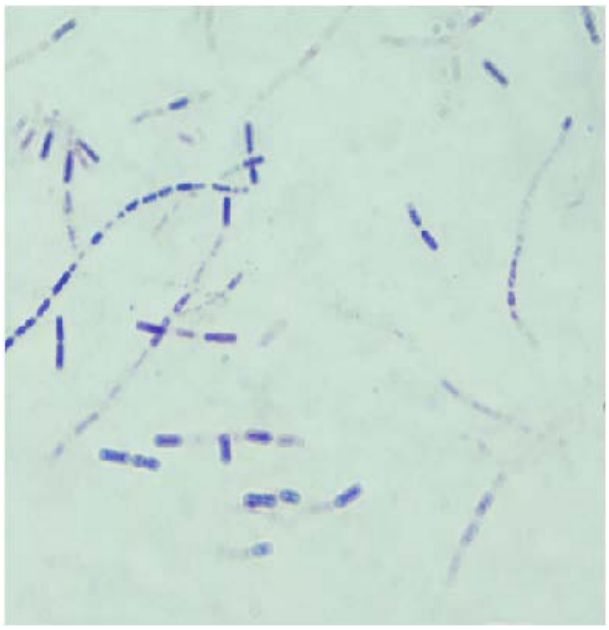

Figure 2a: Brentwood Sample, Colony 9 Gram Staining (1000X).

Figure 3: Hampton Bays Sample, Colony 4 (1:1,000).

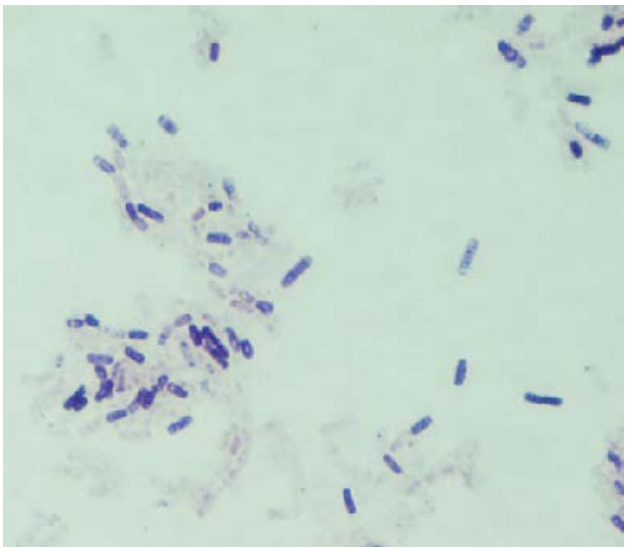

Figure 3a: Hampton Bays Sample, Colony 4 Gram Staining (1000X).

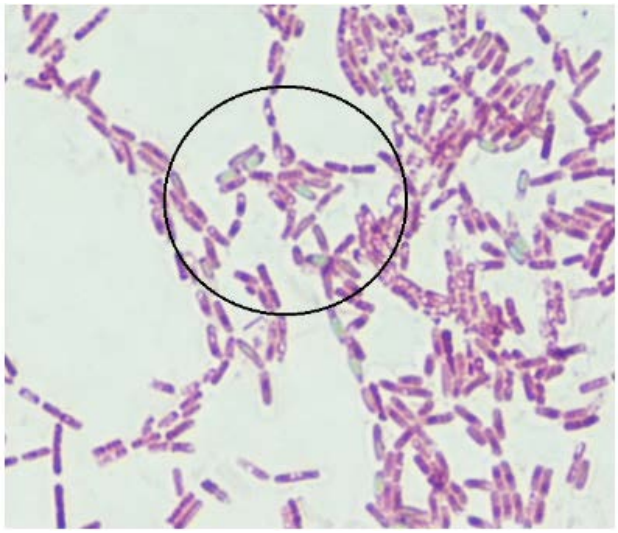

Figure 3b: Hampton Bays Sample, Colony 4 Endospore Staining (1000X).

Figure 4: Hampton Bays Sample, Colony 5 (1:100).

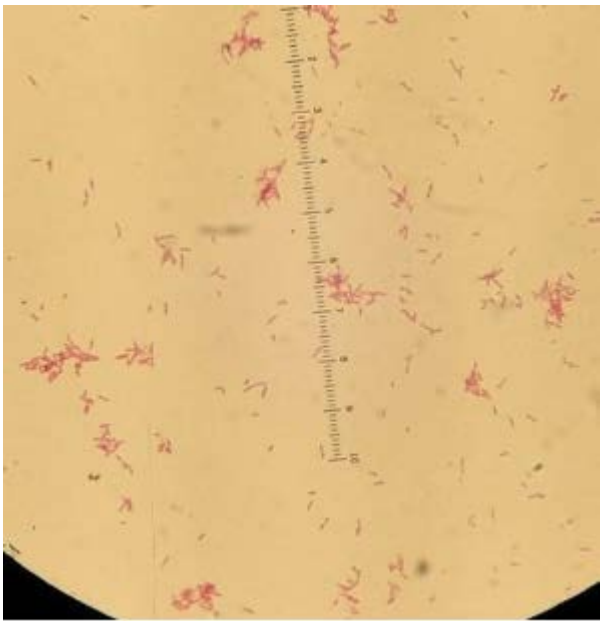

Figure 4a: Hampton Bays Sample, Colony 5 Gram Staining (1000X).

Figure 5: Brentwood Sample, Colony 10 (1:1,000).

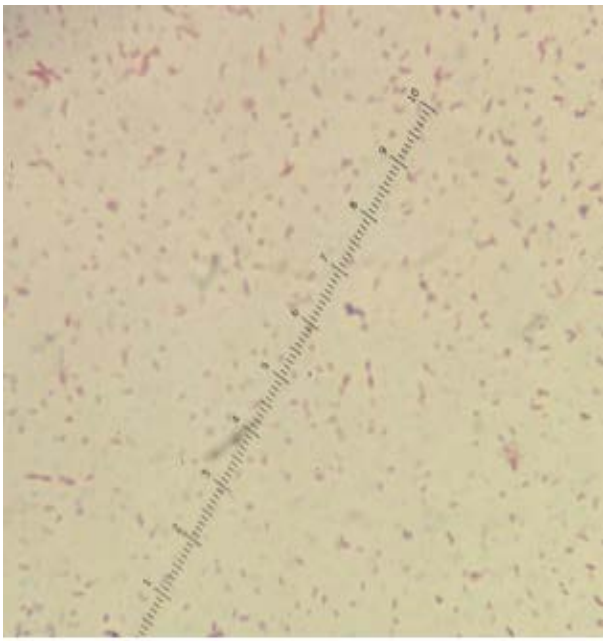

Figure 5a: Brentwood Sample, Colony 10 Gram Staining (1000X).

Figure 6: Brentwood Sample, Colony 13 (1:1,000).

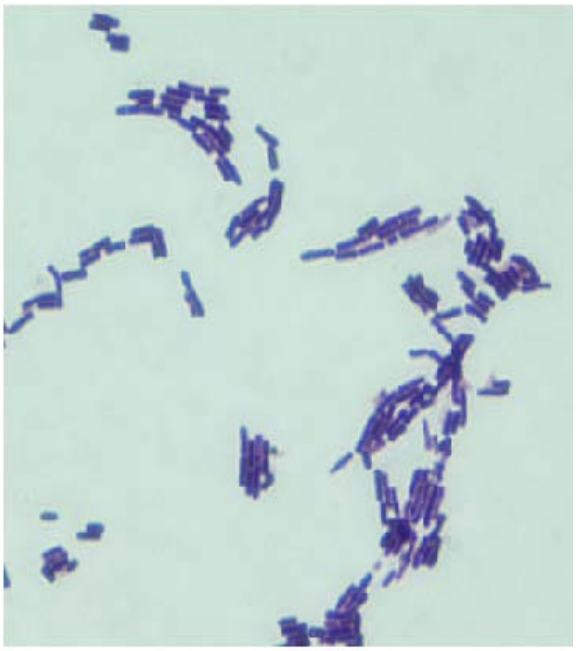

Figure 6a: Brentwood Sample, Colony 13 Gram Staining (1000X).

Figure 6b: Brentwood Sample, Colony 13 Zone of Inhibition (1:1,000).

Figure 7: Brentwood Sample, Colony 12 (1:1,000).

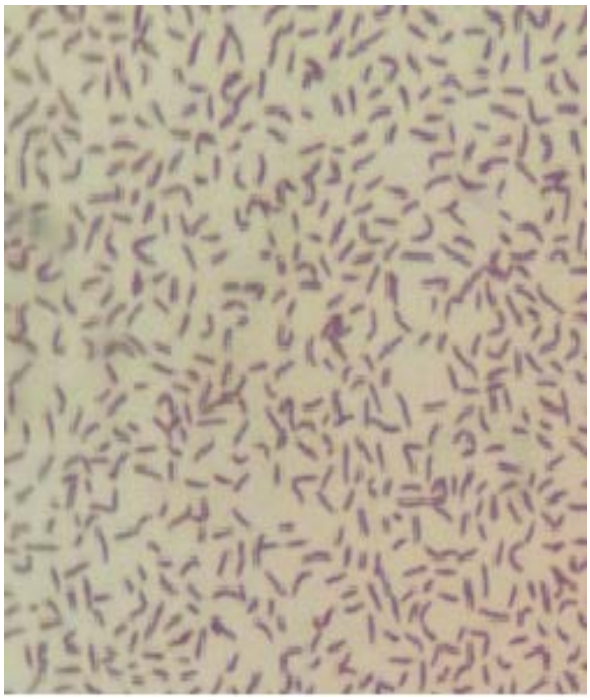

Figure 7a: Brentwood Sample, Colony 12 Gram Staining (1000X).

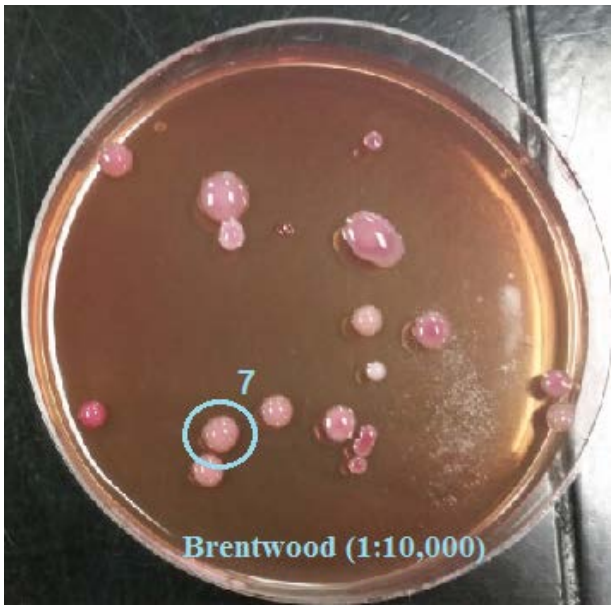

Figure 8: Brentwood Sample, Colony 7 (1:10,000).

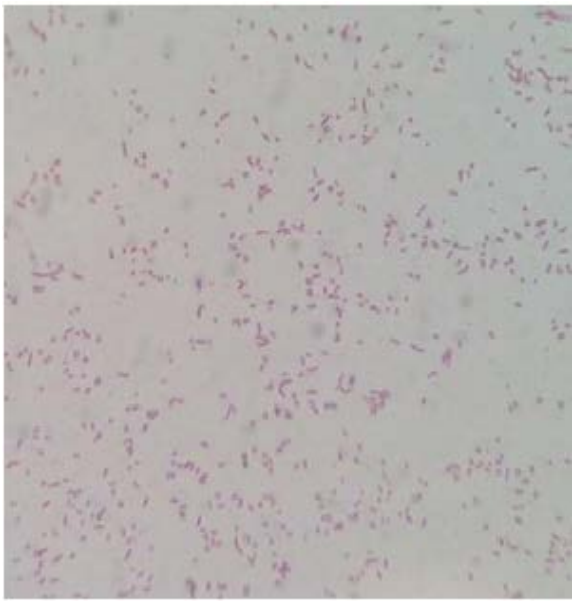

Figure 8a: Brentwood Sample, Colony 7 Gram Staining (1000X).

Colony 10 (Figure 5) was collected from the Brentwood sample diluted to 1:1,000 on TSA. This colony was pale yellow, large, and round with convex elevation. The surface appeared wet with mucoid

texture. Gram staining showed the colony to be made up of gram negative single bacillus (Figure 5a). The cells were short and thick. Colony 13 (Figure 6) was from the Brentwood sample diluted to 1:1,000 on TSA. The colony was opaque white, dry, with irregular margins. The entire colony was round. Gram staining revealed that the colony was made up of gram positive short streptobacilli (Figure 6a). Chains of 4 were observed. Colony 13 was seen to be inhibiting the growth of nearby colony 9. This was observed as a clearing around colony 13 (Figure 6b). The diameter of the zone of inhibition was measured to be 6 mm. Colony 12 (Figure 7) was obtained from the Brentwood sample diluted to 1:1,000 on TSA. The colony was transparent, flat in elevation, with lobate margins. The entire colony appeared blotchy and irregular in shape. Gram staining of this colony showed gram positive bacillus (Figure 7a). Mostly single cells and a few diplobacilli were seen. Colony 7 (Figure 8) was obtained from the Brentwood sample diluted to 1:10,000 on MacConkey Agar. This colony was light pink, smooth, and round. The pink color indicated the colony was able to ferment lactose. The overall texture was mucoid. Gram staining showed the colony to be made up of gram negative bacillus (Figure 8a). Mostly single cells and a few diplobacilli were seen.

Discussion

Results obtained from this study suggest that the composition of the soil and the available organic plant matter influences microbial activity, diversity, and the bacterial species present. High rates of microbial density and interactions are known to affect antibiotic metabolite production in bacterial species. This is consistent with the studies conducted by other scientists. For example, Abdulkadir and Waliyu (2012) have shown that antibiotic production is influenced by factors including the amount of nitrogen and carbon sources available. Antibiotic substances are produced by certain bacterial species in order to inhibit the growth of competing species for resources, such as nutrients. Differences in environmental pH are known to also influence microbial communities. Fierer and Jackson (2005) have found, through their study, that pH is a major factor that contributes to microbial community composition. Most bacterial species prefer neutral to slightly alkaline pH. As the acidity of the soil increases, the community density of bacteria decreases. The study carried out by Shah *et al.* (2011) also supports that soils with acidic pH affect the microbial populations and species type present. They found a high amount of ammonia oxidizing bacteria present in soil with acidic pH, such as in the Pine Barrens Forest of Long Island, N.Y.

Conclusion

The bacterial communities present in the two samples were found to be different to a certain extent. Five distinctive colonies emerged from the Hampton Bays sample and the Brentwood sample. These include Colony 4, Colony 5, Colony 10, Colony 12, and Colony 13. The opaque white, antibiotic producing colonies were only present in the Brentwood sample. This would be expected in a dense environment where competition for nutrients with other microbes is high. The Brentwood soil was obtained from an area near a flower bed with many rose bushes. The numerous fallen petals, leaves, and plant matter contribute to the soil nutrient makeup, providing a nutrient rich environment. The soil also had a slightly alkaline pH, which enabled a more diverse group of bacterial species to thrive. The Hampton Bays soil was observed to be sandy and was taken from an open area near a body of salt water. The bright yellow pinpoint colonies were seen only in the Hampton Bays sample. Factors such as the soil's slightly acidic pH could contribute to the appearance of different species of bacteria that are able to live there and not in the Brentwood soil. By comparing the colony morphology and cell morphology of the two samples, four pairs of bacterial colonies were found to be the same. This result is expected due to the limited geographical range of the study. These include all the gram negative colonies that grew on the MacConkey agar, such as the light pink mucoid colonies. The gram positive filamentous colonies were also seen in both the Hampton Bays sample and the Brentwood Sample.

Both of the samples had mostly single bacilli, with an even distribution of gram positive to gram negative cells. Gel electrophoresis can be done on the bacterial cells to examine the differences in DNA and help identify the bacterial species present in the samples. Different growth medium can be used to observe and isolate different species that are unable to grow on TSA or MacConkey agar. Protein gel electrophoresis can also be performed to acquire the unique protein composition of each colony for comparison. Further research and testing should be done on the antibiotic substance produced by colony 13 to better understand its clinical significance.

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Oak Trees are a Dominate Species on Long Island Residential Properties

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Keywords: Long Island, Coniferous, Deciduous, Trees

Abstract:

Forty-eight trees were identified from four different residential locations on Long Island.The residential properties were located on the north, south and central Long Island. The species of tree were identified using a dichotomous key (Watts, 1998). Identified on the South Shore in West Islip are 10 Pitch Pines (*Pinus rigida*). Pitch Pines are more common on the South Shore of Long Island and are coniferous. Located in South Huntington on central L.I. the following has been identified: four White Oaks (*Quercus Alba*), three Flowering Dogwoods (*Cornus florida*), three White Spruces (*Picea glauca*), three Red Cedars (*Juniperus virginiana*), ten Scarlet Oaks (*Quercus coccinea*), two White Pines (*Pinus strobus)*, two English Hollies (*Ilex aquifolium)*, two Cockspur Hawthorns *(Crataegus crus-galli)*, one Colorado Spruce *(Picea pungens)*, one Sycamore Maple (*Acer pseudoplatanus*), and one Balsam Fir (*Abies fraseri*). On the central L.I. property there were both coniferous and deciduous trees identified. On the two properties located on the north shore in Greenlawn and Commack, there are three Bur Oak trees (*Quercus macrocarpa*) and three Sugar Maple trees (*Acer saccharum*). The trees on the North Shore properties are deciduous. Some of the trees species that were identified are located on three of the four properties and are deciduous. This would indicate that deciduous trees can grow on both the north and south shores of Long Island. It was observed that the ratio of deciduous to coniferous trees is greater on the North Shore of Long Island than on the South Shore. Oak trees have been found to be a dominant species on the North Shore and in Central L.I.

Introduction:

A comparison of deciduous and coniferous trees on Long Island were identified and recorded. As reviewed in Przyborski (2014) deciduous trees have leaves that fall off during the cold winter months and during the spring they begin to produce new leaves. This is so they can absorb less water, which will help them survive our winter conditions. Deciduous trees are normally found in warmer locations. The White Spruces, Pitch Pine, Red Cedars, White Pines, and Balsam Fir trees are coniferous which can flourish in colder temperatures. Coniferous trees shed older needles to be able to produce new ones. Coniferous trees maintain their needles giving them a healthy appearance all year but they shed their leaves when the leaves are old, making way for new leaves being produced (Przyborski, 2014).The climate on the South Shore is much colder which is why trees that prefer the cold grow in this location. What was observed is the Sugar Maple, White Oak, Flowering Dogwood, Scarlet Oak, English Holly, Cockspur Hawthorn, Colorado Spruce, and Sycamore Maple trees are deciduous and can grow in most locations on Long Island but are more prominent on the North Shore. The Bur Oak is also a deciduous tree in which it loses its leaves during the winter and produces new leaves in the summer. The Pitch Pines, White Spruces, Red Cedars, White Pines, and the Balsam Fir are coniferous and grow on the North and South Shores as well as Central Long Island.

Methods:

Four residential properties were involved in this study from the towns of West Islip, South Huntington, Greenlawn, and Commack. The longitude and latitude of each of the properties is recorded in Table-1 (USGS 2014). Using a dichotomous key (Watts, 1998), the students were able to identify the

species of tree that were identified on their individual properties. The students identified how many trees were native to Long Island at each location, as well as accounting for the size of each of lot. After identifying the trees, the circumference of the tree was measured using a tape measure and labeled coniferous or deciduous, as shown in Table-3. The common name, the scientific name of the tree and location was recorded in Table-2. Species were classified native or not native according to the United States Department of Agriculture (Farrell, 2014).

Results:

There were fourteen different species of trees identified within four properties. The Longitude and Latitude of each of these properties were found by using the web tool found by the U.S. Geological Survey (www.usgs.gov) and is recorded in Table-1.West Islip, which is located on the South Shore, contained ten Pitch Pines (*Pinus rigida*) with a circumference range of 59- 65 centimeters for each.

The Central Long Island property in South Huntington contained four White Oaks (*Quercus alba*) with an average circumference of 284 centimeters for each, three Flowering Dogwoods (*Cornus florida*) with an average circumference of 47 centimeters for each, three White Spruces (*Picea glauca*) with an average circumference of 51 centimeters for each, three Red Cedars (*Juniperus virginiana*) with an average circumference of 77 centimeters, ten Scarlet Oaks (*Quercus coccinea*) with an average circumference of 203 centimeters for each, two White Pines (*Pinus strobus*) with an average circumference of 73 centimeters, two English Hollies (*Ilex aquifolium*) with an average circumference of 248 centimeters, two Cockspur Hawthorns *(Crataegus crus-galli*) with an average circumference of 85 centimeters for each, one Colorado Spruce (*Picea pungens*) with a circumference of 91 centimeters, one Sycamore Maple (*Acer pseudoplatanus*) with a circumference of 120 centimeters, and one Balsam Fir (*Abies fraseri*) with a circumference of 49 centimeters.

The remaining two residential properties are located on the North Shore. The property in Commack contained one Bur Oak (*Quercus macrocarpa*) with a tree circumference of 295 centimeters and one Sugar Maple (*Acer saccharum*) with a circumference of 110 centimeters. The property in Greenlawn contained two Bur Oak with a circumference of 210 centimeters each and two Sugar Maple trees with a circumference of 85 centimeters. The Bur Oak, the Sugar Maple and the Red Maple are all deciduous trees. Since the Maple trees were identified on both the North and South Shores of Long Island it is understood that the Maple trees can grow on both shores.

Forty-eight trees were identified on the north, south shores and central L.I. The outcome of this study shows that Pitch Pines were found in 25% of the sample trees. Maple trees are identified in 10% of the samples and the Oak trees were discovered in 48% of the samples taken on L.I. A conclusion can be determined by the results of this study that Oak trees are a dominant species on L.I.

Table-1: Properties

	Property 1 South Shore	**Property 2 Central LI**	**Property 3 North Shore**	**Property 4 North Shore**
Longitude Latitude	-73.294 40.725	-73.370 40.831	-73.364 40.852	-73.282 40.860
Town	West Islip	South Huntington	Greenlawn	Commack
Region	Southern Long Island	Northern Long Island	Northern Long Island	Northern Long Island
Lot Size	30x30 m 100x100 ft.	30x122 m 100x400 ft.	20x30 m 65x100 ft.	23x30 m 75x100 ft.
Tree Count	10	32	2	4
Height above Sea Level	5.991m / 19.295 ft.	60m / 196.9ft	58.388m / 191.562 ft.	40.285m / 191.562 ft.

Table-2: Location of Identified Trees (with regard to property)

West Islip	# Of Trees	South Huntington	# Of Trees	Greenlawn	# Of Trees	Commack	# Of Trees
Pitch Pines	**10**	White Oak	**4**	Bur Oak	**1**	Bur Oak	**2**
-		Flowering Dogwood	**3**	Sugar Maple	**1**	Sugar Maple	**2**
-		White Spruce	**3**	--		-	
-		Red Cedar	**3**	--		-	
-		Scarlet Oak	**10**	--		--	
-		White Pine	**2**	--		--	
-		English Holly	**2**	--		--	
-		Cockspur Hawthorn	**2**	--		--	
-		Colorado Spruce	**1**	--		--	
-		Sycamore Maple	**1**	--		--	
-		Balsam Fir	**1**	--		--	

Table-3: Analysis

# Of Samples	Common Name	Type	Circumference of Tree Trunk	Native Trees
10	Pitch Pine	Coniferous	56-65 centimeters	X
3	Bur Oak	Deciduous	295 centimeters	
3	Sugar Maple	Deciduous	110 centimeters	X
4	White Oak	Deciduous	284 centimeters	X
3	Flowering Dogwood	Deciduous	47 centimeters	
3	White Spruce	Coniferous	51 centimeters	X
3	Red Cedar	Coniferous	77 centimeters	
10	Scarlet Oak	Deciduous	203 centimeters	X
2	White Pine	Coniferous	73 centimeters	X
2	English Holly	Deciduous	248 centimeters	
2	Cockspur Hawthorn	Deciduous	85 centimeters	
1	Colorado Spruce	Deciduous	91 centimeters	
1	Sycamore Maple	Deciduous	120 centimeters	
1	Balsam Fir	Coniferous	49 centimeters	X

Discussion:

The Bur Oak (*Quercus macrocapa*) is native to northern and southern shores of Suffolk County, but not native in Nassau County **(**Farrell, 2014).The Pitch Pine (*Pinus rigida*) is found in all of Long Island, both northern and southern shores. The Sugar Maple (*Acer saccharum*) is native to all of Long Island (Farrell, 2014). All the trees that were located on South Huntington property, as indicated in Table-2, are all native except for the English Holly trees **(***Ilex aquifolium)* and the Sycamore Maple tree (*Acer pseudoplatanus*) (Farrell 2014). The species of trees located on the North Shore, South Shore and Central Long Island shown in Table-3, are not necessarily native to the location where they grew.

Conclusion:

It has been observed by this study that Oak trees are dominant on Long Island residential properties. Seventeen out of the forty trees identified, or 48% belong to the Oak species and were located on the Central and North Shore of Long Island. The Maple trees that are deciduous are also located on the central and the North Shore. The Maple trees accounted for 10% of the trees identified in this study. The Bur Oak, Sugar Maple, White Oaks, Flowering Dogwoods, Scarlet Oaks, English Hollies, Cockspur Hawthorns, Colorado Spruce, and Sycamore Maple are all deciduous trees. The prime thriving location for coniferous trees is in the southern area of Long Island because of its colder temperatures. This means that coniferous trees can survive with their needles intact through the harshest winters.

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Non-Native Trees are Dominant to Native Trees on Some Residential Properties in Brentwood, Bay Shore, and Lindenhurst, New York

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Keywords: Native, Brentwood, Bay Shore, Lindenhurst

Abstract:

On the South Shore of Long Island, sixty six trees were classified using the dichotomous key in three books: Tree Finder (Watts, 1991), Winter Tree Finder (Watts and Watts, 1970), and Peterson Field Guide to Eastern Trees and Shrubs (Petrides, 1988).

After identifying a total of 66 trees found on six different properties on the South Shore part of Long Island, we found that there are more non-native trees rather than native trees on these properties. 43 out of the 66 total trees were non-native, while 23 were native (65% non-native and 35% native). 24 out of the 35 different species of trees that we studied were non-native, leaving 11 native tree species. This means that 69% of the species identified were non-native and 31% were native to Long Island. This suggests that there are more non-native trees being planted in these areas. Twelve out of the 66 trees found on these properties were Maples, which are the only dominant clade in the study (18% Maple).

Introduction:

Native trees can be found in the suburban towns on Long Island, as well as non- native trees due to landscaping and gardening. The term, *native,* is defined as a plant or animal of indigenous origin or growth (Merriam-Webster 2011), while the term, *non-native,* is defined as a plant or animal of none indigenous origin or growth.

This study was conducted from samples of six properties in Brentwood, Bay Shore, and Lindenhurst; towns on the South Shore of Long Island in New York. A total of 66 samples were collected from the six properties, however there were 35 different species found. Due to climate changes throughout the year, certain organisms are native to the South Shore counties on Long Island. The town of Brentwood is an area of 10.1 square miles; according to the 2010 census, Brentwood has a grand total of 60, 664 people residing (U.S Census Bureau 2010), and there are 13, 654 places of residency considered to be occupied housing; referring to the structure itself, not including population. The town of Bay Shore is an area of 5.27 square miles; Bay Shore has a total of 26, 337 people residing there as of the 2010 census. There are 9,064 places of residency considered to be occupied housing. The town of Lindenhurst is an area of 3.75 square miles; as per the 2010 census, there are 27, 253 people residing in this town. These towns vary in size and population and although there are native trees remaining, there is a significant amount of none native trees in these areas.

When this study was conducted however, the seasons were changing from the summer to autumn, which means the leaves were beginning to fall of the branches of the trees on some of the properties.

Methods:

Six students collected a total of 66 trees samples. All six students collected samples on the South Shore of Long Island. Three student's properties were in Bay Shore, two in Brentwood and one

in Lindenhurst. The tree species were then determined using dichotomous keys. There were two dichotomous keys (Theilgaard Watts & Watts 1970, Petrides, & Wehr 1988) used to identify the tree samples. The dichotomous key presented us with possible characteristics from which to choose. After choosing the appropriate characteristics we were presented with the possible species. Then we were able to confirm the species by using the Peterson Field Guide to Eastern Trees by George A. Petrides and Janet Wehr (1988), which had illustrations of trees in full bloom, branches and flowers. In addition this book gave specific descriptions of the species. Each student was then able to identify the common name as well as the genus name of their trees. In addition to determine non-native versus native species we referenced the Queens College academic website, www.qc.cuny.edu, which is an easy to use list taken from Watts (1991). The latitude and longitude of all the properties was then found on the U.S. Geological Survey website (www.usgs.gov).

Results:

After studying a total of 66 trees found on six different properties on the South Shore of Suffolk County (Table 1: Properties in Suffolk County), we found that there is an excessive amount of non-native trees compared to native trees found on Long Island (Table 2: Trees n Each Property). For example, 43 out of the 66 total trees were non-native, while 23 were native (65% non-native to 35% native). Also 23 out of the 34 different species of trees that we studied were non-native, leaving 11 native tree species. In other words, about 68% of the species found were non-native and 32% were native to the island. This suggests that there are more non-native trees being planted in Suffolk County (Table 3: Non-Native and Native Trees).

As shown on table 3 (Native vs. Non-Native Trees), the native trees found include six Flowering Dogwoods (*Cornus florida*), one Silver Maple (*Acer saccharinum*), one Sugar Maple (*Acer saccharum*), five Scrub Pines (*Pinus virginiana*), one Red Spruce (*Picea rubens*), two Red Maples (*Acer rubrum*), one Sassafras (*Sassafras albidum*), one Sycamore (*Acer pseudo platanus*), one Fire Pin Cherry (*Prunus pensylvanica*), three Cherry Blossoms (*Pirunus serrulata*) and one Euonymus (*Japonicus aureus*) tree.

Also shown from Table 3 (Native vs. Non-Native Trees), the non-native trees that were found include one Boxelder Ash Leaf Maple (*Acer negundo*), five Norway Maples (*Acer platanoides*), two Japanese Maples (*Acer plamatum*), one White Spruce (*Picea glauca*), ten Northern White Cedars (*Thuja occidentalis*), one Tree of Heaven (*Ailanthus altissima*),one Weeping Cherry (*Prunus pendula*), one Jack Pine (*Pinus banksiana*), one Horse Chestnut (*Aesculus hippocastanum*), two Osage Oranges (*Maclura pomifera*), two Mimosa Silks (*Albizia julibrissin*), two Colorado Spruces (*Picea pungens*), one Star Magnolia (*Magnolia stellate*), four English Hollys (*Ilex aquifulium*), one Shindgle Oak (*Quercus imbricaria*), one Labrador Tea (*Ledum groeniandicum*), one Winter Creeper (*Euonymus fortuneis*), one Red Mulberry *(Morus rubra*), one Yellow Buckeye (*Aesculus octandra*), one Buckle Berry, one Staghorn Spruce (*Rhus typhina*), one Common Juniper (*Juniperus communis*) and one Cercocarpus (*Cercocarpus montanus*) tree.

Table 2: Trees on Each Property shows which and how many of each tree was found on the six different properties in the towns of Bay Shore, Brentwood and Lindenhurst. From the chart, it is easy to see that several of the same species of trees were found throughout the different properties. For instance, the Flowering Dogwood (*Cornus florida*) was found on four properties, three times on property one in Bay Shore, once on property two in Bay Shore, once on property four in Brentwood and once on property six in Lindenhurst. Since the Flowering Dogwood is a native tree, as shown in Table 2, it is no surprise that this tree is found on several properties. Another type of tree that showed up throughout the towns was the Maple trees. A total of twelve trees that were found turned out to be some species of Maple genus. Five of these Maple trees discovered were the Norway Maple trees. This tree showed up three times on property one in Bay Shore, once on property two in Bay Shore, and once

on property five in Brentwood. The other Maples that were found were the Red Maples, the Japanese Maple, the Silver Maple and Sycamore Maple (each found once on property four in Brentwood), and the Sugar Maple.

Table 1: Properties in Suffolk County

	Property 1	**Property 2**	**Property 3**	**Property 4**	**Property 5**	**Property 6**
Town	Bay Shore	Bay Shore	Bay Shore	Brentwood	Brentwood	Lindenhurst
Region	South Shore	South Shore	South Shore	South Shore	South Shore	South Shore
Latitude/ Longitude	40.7202/ -73.2550	40°45N/ 73’16	40°44’43. 108	40°46 ’43.000	40°47N/ 7313	65°26’24N/ 099°29’31
Number of Trees	32	6	3	6	15	4
Property Size	2,023 sq. m 0.5 Acre	1,214 sq. m 0.30 Acre	688 sq. m 7,405 sq. ft.	1,012 sq. m 0.25 Acre	1,821 sq. m 0.45 Acre	20x30 m 65x100 sq. ft.

Table 2: Trees on Each Property

Property 1 Bay Shore	**Property 2 Bay Shore**	**Property 3 Bay Shore**	**Property 4 Brentwood**	**Property 5 Brentwood**	**Property 6 Lindenhurst**
3 Norway Maples	1 Norway Maple	1 Fire Pin Cherry	1 Shindgle Oak	1 Norway Maple	1 Star Magnolia
2 Colorado Spruces	1 Red Maple	1 Tree Of Heaven	1 Silver Maple	1 Red Maple	1 Weeping Cherry
1 Horse Chestnut	1 Red Mulberry	1 Japanese Maple	2 Osage Oranges	1 Winter Creeper	1 Cherry Blossom
3 Flowering Dogwoods	1 Flowering Dogwood		1 Flowering Dogwood	1 Labrador Tea	1 Flowering Dogwood
4 English Hollys	1 Japanese Maple		1 Sycramore Maple	1 Euonymus	
9 Northern White Cedars	1 Northern White Cedar			1 Yellow Buckeye	
2 Cherry Blossoms				1 Buckle Berry	
5 Scrub Pines				1 Staghorn Spruce	
1 Jack Pine				1 Cerocarpus	
2 Mimosa Silk				1 Boxelder Ash Leaf Maple	
				1 White Spruce	
				1 Sugar Maple	
				1 Red Spruce	
				1 Common	

				Juniper	
				1 Sassafras	

Table 3: Non-Native and Native Trees

Common Name	**Species Name**	**# Count**	**Native**	**Non-Native**
Boxelder Ash Leaf Maple	*Acer negundo*	1		X
Buckle Berry		1		X
Cercocarpus	*Cercocarpus montanus*	1		X
Cherry Blossom	*Pirunus serrulata*	3	X	
Colorado Spruce	*Picea pungens*	2		X
Common Juniper	*Juniperus communis*	1		X
English Holly	*Ilex aquifulium*	4		X
Euonymus	*Japonicus aureus*	1	X	
Fire Pin Cherry	*Prunus pensylvanica*	1	X	
Flowering Dogwood	*Cornus florida*	6	X	
Horse Chestnut	*Aesculus hippocastanum*	1		X
Jack Pine	*Pinus banksiana*	1		X
Japanese Maple	*Acer plamatum*	2		X
Labrador Tea	*Ledum groeniandicum*	1		X
Mimosa Silk	*Albizia julibrissin*	2		X
Northern White Cedar	*Thuja occidentalis*	10		X
Norway Maple	*Acer platanoides*	5		X
Osage Orange	*Maclura pomifera*	2		X
Red Maple	*Acer rubrum*	2	X	
Red Mulberry	*Morus rubra*	1		X
Red Spruce	*Picea rubens*	1	X	
Sassafras	*Sassafras albidum*	1	X	
Scrub Pine	*Pinus virginiana*	5	X	
Shindgle Oak	*Quercus imbricaria*	1		X
Silver Maple	*Acer saccharinum*	1	X	
Staghorn Spruce	*Rhus typhina*	1		X
Star Magnolia	*Magnolia stellata*	1		X
Sugar Maple	*Acer saccharum*	1	X	
Sycamore	*Acer pseudo platanus*	1	X	
Tree of Heaven	*Ailanthus altissima*	1		X
Weeping Cherry	*Prunus pendula*	1		X
Winter Creeper	*Euonymus fortuneis*	1		X
White Spruce	*Picea glauca*	1		X
Yellow Buckeye	*Aesculus octandra*	1		X
Total		66	23	43
Percent		100%	35%	65%

Discussion:

We have found that non-native trees can be more dominant than native, and this was also found in another study by Dooling *et al*. (2014). In all of the different properties, which were Brentwood, Bay Shore and Lindenhurst, there were native and non-native trees. The flowering dogwood (*Cornus*

florida) was found in all of our three towns and it is considered to be a native tree. This tree was also found in two other studies made by other students stating in their study that it was common in East Northport, West Islip and in Huntington Bay (Kurz *et al.* 2014). The following trees that were common between all of our three towns were the Maple trees. According to our results there were more non-native Maple tree species on the properties than actual native Maple trees. There were a total of twelve different Maple trees found and five of them were non-native species.

In Suffolk County non- native trees may out populate the native trees on residential properties. Our results indicated that there were an excessive number of non-native trees and species. For example, 43 out of the 66 total trees were non-native, while 23 were native, 24 out of the 35 different species of trees that we studied were non-native, leaving 11 native. We were also able to compare our results to another study that compared native to non-native trees in five different properties of Suffolk County, and 17 out of 30 species and 35 out of the 58 different trees collected were non-native to the region (Dooling *et al*. 2014). This also indicated that there are more non-native trees being planted in Suffolk County on residential properties.

Conclusion:

35 different tree species were identified in six particular properties on the South Shore of Long Island, and 66 trees were identified on the six properties. The trees identified on the South Shore of Long Island were in Bay Shore, Brentwood, and Lindenhurst. Out of the 66 trees identified 43 were non-native (65%). Out of the 35 different tree species, 24 tree species were non-native trees, and only 11 were native (69% were non-native, leaving 31% to be native). Twelve out of the 66 trees found on these properties were Maples, which are the only dominant clade in the study (18% Maple). Many non-native tree species have been introduced to Long Island. In this study, out of the 12 Maple trees 7 were non-native (58%).

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A Comparison of Tree Species from Dix Hills, Commack and Huntington NY

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Keywords: DixHills, Commack, Huntington

Abstract: Forty-one tree samples were obtained from three residential properties located in Suffolk County on Long Island. Twenty in Dix Hills, eleven in Commack and ten in Huntington. By using two dichotomous keys, the characteristics and names of the tree species could be identified and confirmed. The Square footage of the Dix Hills residential property was 0. 48 acres, the square footage of the Commack residential property was 0.47 acre and the square footage of the Huntington residential property was 1 acre. The tree species from Dix Hills were identified as Hackberry (*Celtis occidentials*), Scarlet Oak (*Quercus coccinea*), Pin Oak (*Quercus palustris*), Northern Red Oak (*Quercus Rubra),* Pussy Willow (*Salix Discolor*), Black Willow (*Salix nigra*), Common Lilac (*Syringe vuigaris,* White Oak (*Querrcusa alba*), Black Maple (*Acer nigrum*), and Arbor Vitae (*Thuja occidentals*). The tree species from Commack were identified as Black Maple (*Acer nigrum*), Hackberry *(Celtis occidentials*), Blue Spruce (*Piceap pungens*), White Oak (*Quercus alba*). The tree species found from Huntington were identified as Honey Locis (*Gieditisa triacanthos*), Black Spruce (*Picea mariana*), unknown, Arbor Vitae (*Thuja occidentials*). White Oak, Black Maple, Arbor Vitae and Hackberry were species found on two of the residential properties.

Introduction: We hypothesized that we would have at least four to six trees in common because we all live on the north shore of Long Island. The following characteristics were all found using *Virginia Tech Tree Identification app via iPhone.* The Hackberry (*Celtis occidentalis*) is a medium sized tree that grows up to 60 feet tall with a wide spreading crown. The Scarlet Oak *(Quercus coccinea*) is also a medium sized tree that can reach up to 80 feet and carries a lot of dead branches. This tree carries acorns that are ½ to 1 inch long with the cap covering ½ of the nut. Pin Oak (*Quercus palustris*) carries acorns that are ½ inch long and matures after two years. The tree is medium sized with a pyramidal shape with branches at the bottom that are pendulous and middle branches that grow at right angles. Northern Red Oak (*Quercus rubra*) can grow up to 90 feet tall with a short trunk and round crown. The pussy willow (*salix discolor*) is a small tree/shrub that grows up to 30 feet and has slender twigs with buds that are purple-red with a single cap like scale. The Black Willow (*Salix nigra*) is a small to medium sized tree that can develop a massive trunk and irregular crown. The twigs are thin, the buds are small and covered by once bud scale. Common Lilac (*Syringa vulgaris*) is a shrub or multi-stemmed small tree, growing between 20-23 feet. Producing secondary shoots from the base or roots, with stem diameters of up to 20 cm. The bark is grey to grey-brown, smooth on young stems, furrowed and flaking on older stems. Poison Ivy (*Toxicodendron radicans*) is a poisonous flower/plants that is known for causing an itching, irritating, and sometimes painful rash in most people who touch it. Leaf color ranges from light to dark green. The leaflets are 3–12 cm. Each leaflet has a few or no teeth along its side, and the leaf surface is smooth. Leaflet clusters are alternate on the vine, and the plant has no thorns. Vines growing on the bottom of a tree become firmly attached through numerous aerial rootlets. The vines develop adventitious roots, or the plant can spread from the root crowns. White Oak (*Quercus alba*) a large tree, growing up to 100 feet tall. Its trunk can get up to four feet across. The leaves on the White Oak are four to nine inches long. They are bright green on top, and whitish underneath. White Oak leaves turn red or brown in the Fall, and will often stay on the branches during

the winter. Black maple (*Acer higrum*) is a wide tree and has drooping leaves, a long leaf stalk, and waxy coating on twigs greater than two years old. Arbor Vitae (*Thuja occidentials*) are evergreen trees growing from 10 to 200 feet tall, with stringy-textured reddish-brown bark. The shoots are flat, with side shoots only in a single plane. The leaves are scale-like 1–10 mm long, The scale leaves are arranged in alternating pairs in four rows along the twigs. The male cones are small, well hidden, and are located at the top of the twigs. The female cones start out the same not seen very well, but grow to about 1–2 cm long at maturity when 6–8 months old; they have 6-12 overlapping, thin, leathery scales, each scale bearing 1–2 small seeds with a pair of narrow lateral wings.

Methods: Three students took part in this experiment. They collected branches approximately 12 cm long with leaves and buds. Tree samples were located on the following residential homes of 45 Seward Drive, Dix Hills NY 11746 (latitude: 40.8050 longitude: -73.3042), 23/25 Longmeadow Road, Commack NY 11725 (latitude: 40.7969, longitude: -73.2754) and 77 Brennan Street, Huntington NY 11743 (latitude: 40.8378300 longitude: -73.3606460). We analyzed the characteristics of each species using two dichotomous keys to identify and confirm tree species, *Virginia Tech Tree Identification app via iPhone and the Pholox Key app vi android.*

Results

Latitude and Longitude: Table #1

Town	Latitude	Longitude
Dix Hills	40.8050	-73.3042
Commack	40.7969	-73.2754
Huntington	40.8378	-73.3606

Trees found in Dix Hills: Table #2

Number Found	Common Name	Species Name
2	Heckbery*	Celtis occidentials*
2	Scarlet Oak	Quercus coccinera
1	Pine oak	Quercus Palustris
1	Northern Red Oak	Quercus Rubra
3	Pussy Willow	Salix discolcr
1	Black Willow	Salix nigra
2	Common Lilac	Syringa Vuigaris
1	Passion Ivy	Toxicodendron radicans
1	White oak*	Quercus Alba*
3	Black Maple*	Acer higrum*
3	Arbor Vitae**	Thuja Occidentalis**

Trees found in Commack: Table #3

Number Found	Common Name	Species Name
1	Black Maple*	Acer nigrum*
2	Hackberry*	Celtis Occidentiais*
2	Blue Spruce	Picea Pungens
1	White oak*	Quercus alba*
1	Arbor Vitae**	Thuja occidentalis**

Trees found in Huntington: Table #4

Number Found	Common Name	Species Name
2	Honey Locus	Gieaitisia triacanthos
1	Black Spruce	Picea Maniana
8	Arbor vitae**	Thuja occidentalis**
1	Horse Chestnut	Aesulus hippocastamum

Key:
**- Trees found on all 3 properties
*- Trees found on 2 out of 3 of the properties

As seen in table number 2 and 3, there are many common trees in the areas Dix Hills and Commack. We were not surprised by these findings because the two homes are within a 6-mile radius of one another. The home in Huntington also has a species in common with both Dix Hills and Commack locations. The homes closer to one another have a higher likelihood of having similar tress on their property.

Discussion: A study by Townes *et al*. (2013) found that a residential house located in Dix Hills had two of the same species as the one that was part of our experiment. Both residents have Northern Red Oak and White Oak on their properties. The studies from Altenburg and Hempel (2013) shared four trees in common that were located on the Commack and Huntington properties. The Arbor Vitae was on both Commack and Huntington properties and the Honey Locus, Black spruce, Horse Chestnut located in Huntington. When compared to other North Shore homes we had similar tree species.

Conclusions: In this study, it was found that out of the 41 samples and 15 species collected from Dix Hills, Commack and Huntington four were found in both Dix Hills and Commack locations (Hackberry, White oak, Black Maple and Arbor vitae). One species was found in all three locations (Arbor Vitae). All 3 properties share one or more species in common with another property on the North Shore Long Island.

Another conclusion from this research is that homes that are close to one another are more likely to have more species in common than homes that are farther apart. The Dix Hills and Commack homes are within 6 miles from one another and have more common tree species compared to the homes in Huntington.

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Leyland Cypress (*Cuprocyparis leylandii*) is found on the North Shore and South Shore of Long Island

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Keywords: White Spruce, Holly, Birch, Big Leaf Maple, Evergreen, and Leyland Cypress

Abstract: A dichotomous key was used to identify the species of 144 trees on residential properties. One property was located in Kings Park on the North Shore of Long Island while the other was located in Bay Shore on the South Shore. It was found that Leyland Cypress (*Cupressocyparis leylandii*) thrives on both the North Shore and South Shore of Long Island. The species we identified include the Big Leaf Maple (*Acer macrophyllum*), Red Maple (*Acer rubrum),* Leyland Cypress (*Cupressocyparis leylandii*), White Spruce (*Picea glauca*), Blue Spruce (*Picea pungens*), Carpe Myrtle (*Lagerstroemia*), Birch (*Betula*), Evergreen (*Thuja*), and Holly (*Ilex opaca*). The Blue Spruce (*Picea pungens*), Maple (*Acer rubrum),* Carpe Myrtle (*Lagerstroemia*), and Leyland Cypress (*Cupressocyparis leylandii*) were found both in Kings Park and Bay Shore while the rest were found in only Bay Shore.

Introduction: With the help of a dichotomous key, we identified ten species trees on two separate properties in Kings Park and Bay Shore. The distance between Kings Park and Bay Shore is driving distance of 15.5 miles (Google 2014). The weather in Kings Park is a little harsher than that of Bay Shore, (Sperling 2014) which leads us to believe that the Leyland Cypress (*Cupressocyparis leylandii*) has adapted to harsh weather conditions. Kings Parks weather is slightly harsher then Bay Shore because Kings Park gets slightly more rain and snowfall. The rain and snowfall varies by 5 to 10 inches more in Kings Park (Sperling 2014).

Methods: Two students collected data for this experiment. Each identified tree species using information from dichotomous keys (William 2007). We then figured out which trees were conifers and deciduous, and categorized them. Then we found the latitude and longitude of the properties we used in the study (Google 2014).

Results: We determined that Leland Cypress can live on both the North Shore and the South shore of Long Island.

As the results of this experiment, we found that the Leyland Cypress and Maple trees are two species found in Bay Shore (Table A) and Kings Park (Table B), that survive on both the North Shore and South Shore of Long Island.

The trees found in Bay Shore are as followed White Spruce (*Picea glauca*), Holly (Ilex opaca), Birch (*Betula*), Big Leaf Maple (*Acer macrophyllum*), Evergreen (*Thuja*), and Leyland Cypress (*Cupressocyparis leylandii*).

The trees Found in Kings Park are as followed Leyland Cypress (*Cupressocyparis leylandii),* Blue Spruce *(Picea pungens),* Red Maple *(Acer rubrum),* and Crape Myrtle (*Lagerstroemia*)

The most dominant species was the Leyland Cypress (*Cupressocyparis leylandii*).

Table A: Tree Samples Found in Bay Shore (Brightwaters), NY

Common Name of Tree	Species Name	Amount of Trees	Indigenous or not
White Spruce	*Picea glauca*	14	No
Holly	*Ilex opaca*	1	Yes
Birch	*Betula*	1	Yes
Big Leaf Maple	*Acer macrophyllum*	5	Yes
Evergreen (Arborvitae)	*Thuja*	3	No
Leyland Cypress	*Cupressocyparis leylandii*	20	No

Table B: Tree Samples Found in Kings Park, NY

Common Name of Tree	Species Name	Amount of Trees	Indigenous or not
Leyland Cypress	*Cupressocyparis leylandii*	90	No
Blue Spruce	*Picea pungens*	6	No
Red Maple	*Acer rubrum*	3	Yes
Crape Myrtle	*Lagerstroemia*	1	No

Discussion: Red Maple *(Acer rubrum)*, Big Leaf Maple *(Acer macrophyllum)* and Leyland Cypress (*Cuprocyparis leylandii*) trees are not indigenous to Long Island (Minore & Zasada, 1985). Leyland Cypress (*Cupressocyparis leylandii*) is not native to anywhere but they are able to adapt to many different environments (Gilman & Watson, 1993). Maple trees are native to areas in Alaska down to southern California, as well as some areas in Idaho (Minore & Zasada 1985). The Leyland Cypress (*Cuprocyparis leylandii*) is a cross between the Monterey Cypress (*Hesperocyparis macrocarpa)* and the Alaskan Cedar *(Chamaecyparis nootkatensis)*, which are native to the Pacific coast of North America (Schoenike & Gaffney. 1999). Minore and Zasada refer to Leyland Cypress as *Cuprocyparis leylandii* but Gilman and Watson refer to Leyland Cypress as *Cupressocyparis leylandii* because it is a crossbreed and there are different ways to refer to it. The seedlings have been transported all over the country showing the trees can survive in different areas. The North Shore of the island is much windier and has lower temperatures compared to the South Shore so that shows that the tree can adapt to different climates and types of environments (Gilman & Watson 1994). The northern portions of the island are subjected to lower temperatures and higher winds, which usually create inhospitable living conditions for large plants. The conifers are able to thrive in this challenging environment due to their ability to manufacture chlorophyll throughout the duration of the winter months (Sperling 2014).

Conclusion: Our study shows that deciduous trees are more inclined to inhabit central and southern areas, while conifers are prominent throughout the north of Long Island. This conclusion is supported because Birch (*Betula*), Holly (*Ilex opaca*), and Big Leaf Maple (*Acer macrophyllum*) trees have been found in Bay Shore, while Leyland Cypress (*Cupessrocyparis leylandii*) trees have been found in Kings Park. As stated in the discussion, the Leyland Cypress (*Cupressocyparis leylandii*) originated from the Monterey Cypress (*Hesperocyparis macrocarpa)* and the Alaska Cedar *(Chamaecyparis nootkatensis),* which grew on the Pacific coast of North America (Schoenike & Gaffney 1999). This is evidence that

the Leyland Cypress has been spread all over the country and has been able to adapt to the many different types of environments.

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Maples Are a Dominant Genus in North, Central and South Shore Long Island in SuffolkCounty, New York

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Keywords: Maples, Kings Park, Belmont Lake State Park, Lindenhurst

Abstract:

Forty-four plant samples were collected from Belmont Lake State Park, Lindenhurst, and Kings Park. In Belmont Lake State Park, thirty samples were collected. One American Elm *(Ulmusj americana),* one Sycamore *(Plantanus occidentalis),* two Eastern White Pines *(Pinus strobes),* two American Holly *(llex opaca),* one Pitch Pine *(Pinus rigida),* one Flowering Dogwood *(Cornus florida),* two Colorado Spruce *(Picea pungens),* three Eastern Hemlock *(Tsuga canadenus),* one White Spruce *(Picea glauca),* two Red Spruce *(Picea rubens),* one Black Alder *(Alnus glutinosa),* two Norway Maple *(Acer platanoids),* three Red Maple *(Acer rubrum)* one Sassafras *(Sassafras albidum),* two Deciduous Holly *(llex decidua),* three Big Leaf Maple *(Acer macrophylum),* two Silver Maple *(Acer saccharinum).* In Lindenhurst, six samples were collected one Red Maple *(Acer rubrum),* one Flowering Dogwood *(Cornus florida),* one Big Leaf Maple *(Acer macrophylum),* one American Beach grass *(Ammophilla breviligulata),* two Sugar Maple *(Acer saccarum).* In Kings Park, eight samples were obtained, one American holly *(llex paca)* one Diciduous Holly *(Llex decidua),* three Norway maple *(Acer platanoides),* one Sugar Maple *(Acer saccarum),* one Big Leaf Maple *(Acer macrophylum),* and one Flowering Dogwood *(Cornus florida).* We identified them using two dichotomous keys and apps such as “Leaf Snap”. “Leaf Snap” was created researchers from Columbia University, the University of Maryland, and the Smithsonian Institution (”Leafsnap: An Electronic Field Guide"). Key features we examined in each sample were terminal buds, arrangement of leaves, buds, shape and color. Forty-one percent of the specimen’s collected were Maples Belonging to the genus *Acer,* determining that Maples are a dominant clade in these areas.

Introduction:

Long Island is roughly about 1,723 square miles long and 12 to 20 miles wide. Suffolk County being the largest of the four Long Island counties covers 911 square miles (Lagasse 2000). Plant samples were collected from Belmont Lake State Park, Lindenhurst, and Kings Park. Having an abundance of samples from Belmont left us with the most variation of species there. A dichotomous key is a tool that allows the user to determine the identity of species in the natural world. As reviewed by Morgan (2005), Maples including several species that grow into large shade trees, are commonly planted as part of Long Island landscapes. The most common large Maples include the Red Maple, Sugar Maple, Norway Maple and Silver Maple. The first two of these are native to Long Island and the others are exotic (non-native) species that have been introduced to Long Island from elsewhere. Each of these has distinctive characteristics that influence their suitability for a given location (Morgan 2005). Surveys that included Maple trees were compared between the north, central and southern areas of Long Island in Suffolk County.

Method:

41 samples of tree branches were collected from three different locations in Belmont Lake State Park, Lindenhurst and Kings Park, and identified. Samples contained either a couple of leaves or a

branch with visible buds. The dichotomous keys Tree Finder (Watts, 1991) and Eastern trees (Petrides & Wehr, 1988) were used to identify the samples. Another asset used to identify each sample was the app “Leaf Snap”. To use “Leaf Snap”, we place a leaf sample on a white background and took a photo. The app then identifies the leaf and determines the tree species. Selections were eliminated by identifying whether the sample had leaves or needles, staggered leaves or none staggered, bundles of leaves or needles and how many. Selections were narrowed down to Genus and Species by this process. Size, shape, color, and texture had identification features as well. Vein scars were used to determine where a leaf may have been before, which was also useful when identifying. Lateral and terminal buds were identification factors as well. Veins that run through leaves are key identifying factors especially when distinguishing between different maple tree samples. All shapes and colors were involved and observed when eliminating choices. When all positive characteristics are determined, the species is identified. Latitude and Longitude were found using United states Geological Survey (usgs.gov).

Results:

In our three chosen locations Belmont Lake State Park, Lindenhurst, and Kings Park forty-one samples were obtained, many of which are similar in more than one location. In these areas of Suffolk county, we obtained American Elm (*Ulmus americana*), American Sycamore (*Plantanus occidentalis*), Easter White Pine (*Pinus strobes*), American holly (*Llex opaca*), Pitch Pine (*Pinus rigida*), Flowering Dogwood (*Cornus florida*), Colorado Spruce (*Picea pugens*), Eastern Hemlock (*Tsuga canadenus*), White Spruce (*Picea glauca*), Red Spruce (*Picea rubens*), Black Alder (*Alnus glutinosa*), Red Maple (*Acer rubrum*), Norway maple (*Acer plantanoides*), Sassafras (*Sassafras albidum*), Deciduous Holly (*Llex decidua*), Big leaf Maple(*Acer marcrophylum*), American Beach Grass (*Ammophila breviligulata*), and Sugar maple (*Acer saccharum*). In total, nineteen different species were found out of the total of forty-four samples. A diverse population of plants was found to exist in all three locations. Eighteen of forty-four samples collected were Maple. Forty-one percent of our samples were Maples of the genus *Acer*, concluding that Maples are a large clade in these areas.

Table 1: Gps locations of samples collected in Suffolk county long island, New York

	LATITUDE	LONGITUDE
Belmont Lake State Park	**40.7191**	**-73.3316**
Lindenhurst	**40.6978**	**-73.3885**
Kings Park	**40.8862**	**-73.2573**

Table 2: Trees Common Name, Genus, Species and Amount Found In Belmont Lake State Park

1-American Elm (*Ulmus Americana*)	2-Red Spruce (*Picea rubens*)
1-American Sycamore (*Plantanus occidentalis*)	1-Black Alder (*Alnus glutinosa*)
2-Eastern White Pine (*Pinus strobes*)	3-Red Leaf Maple (*Acer rubrum*)
2-American Holly (*Llex opaca*)	2-Norway Maple (*Acer platanoides*)
1-Pitch Pine (*Pinus rigida*)	1- Sassafras (*Sassafras albidum*)
1-Flowering Dogwood (*Cornus florida*)	2-Deciduous holly (*Llex deciduas*)
2-Colorado Spruce (*Picea pugens*)	3- Big leaf Maple (*Acer macrophylum*)
3-Eastern Hemlock (*Tsuga canadenus*)	2-Silver Maple (*Acer Saccharinum*)
1-White Spruce (*Picea glauca*)	

Table 3: Trees Common Name, Genus, Species and amount found in Lindenhurst

1- Big Leaf Maple (*Acer macrophylum*)	1-American Beach Grass (*Ammophila breviligulata*)
1- Red Leaf Maple (*Acer rubrum*)	2-Sugar maple (*Acer saccharum*)
1- Flowering dogwood (*Cornus florida*)	

Table 4: Trees Common Name, Genus, Species and Amount Found In Kings Park

1-American Holly (*Llex opaca*)	1-Sugar Maple (*Acer sacchararum*)
1-Deciduous Holly (*Llex deciduas*)	1-Big Leaf Maple (*Acer macrophylum*)
3-Norway Maple (*Acer platanoides*)	1-Flowering Dogwood (*Cornus florida*)

Discussion:

Our samples determined a similarity and difference in species found within Lindenhurst, Belmont state park and Kings Park. Ambrogio et al. (2013) also found the Flowering Dogwood in the north and south shore. They collected samples for the North Shore from Northport, Kings Park, and Huntington Station. For the South Shore, they collected samples from Brentwood and East Islip. They were able to identify White Pine (*Pinus strobes),* Black Walnut *(Juglas naira),* Mimosa Silk Tree *(Albizin julibrissin),* Horse Chestnut *(Ascuius hippocastanum),* Water Oak *(Quercus nigra),* Eastern Hemlock *(Tsungce Canadensis), and* Black Locust *(Rabinia pseudoacacia)* in the North Shore which we did not find. Martin et al. (2014), were also able to find the Big Leaf Maple (*Acer macrophylum)* and Deciduous holly (*Llex deciduas*) in Central Islip. They were also able to find different species such as the Bottle Brush Buckeye (*Aesculus*), Striped Maple (*Acer pensylvanicum*), Winged Euonymus (*Euonymus alatus),* Mapleleaf Viburnum (*Viburnum acerifolium),* Norway Spruce (*Picea abies),* Saucer Magnolia (*Chinese magnolia),* and the Northern White *(Thuja occidentalis*). Perks et al.(2013), took tree samples from Lindenhurst as well. They also found Red Leaf Maple (*Acer rubrum*) and Flowering Dogwood (*Cornus florida).*

Conclusion:

In this study, only the Flowering Dogwood (*Cornus florida)* and the Big Leaf Maple (*Acer macrophylum)* were found in the Northern, Central, and Southern shores of Long Island. American Holly *(llex opaca),* Deciduous holly (*Llex deciduas*), and the Norway Maple (*Acer plantanoides*) were all found in Kings Park and Belmont Lake State Park. In Lindenhurst and Kings Park, the Sugar Maple was a common species collected. In Belmont and Lindenhurst, the Red Maple (*Picea pugens*) was identified. The tree samples collected determined that there are some common tree species around Long Island but most areas have large a variety of tree species. Forty-one percent of the specimen's collected were Maples Belonging to the genus Acer, determining that Maples are a dominant clade in these areas.

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Comparison of Tree Species Located in Lindenhurst, West Islip, and Brentwood (Long Island, NY)

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Keywords: Biology, Dichotomous Key, Trees

Abstract:

76 samples of trees were collected across three town parks located in Suffolk County, New York. The parks were located in Lindenhurst, West Islip, and Brentwood. Through the use of two dichotomous keys, the samples collected were identified. Out of the 76 samples, 26 were part of the Maple family. That is a total of 36% were Maple decent. Each park had some kind of Maple on their property. These results illustrate the high population of Maples in Suffolk County, New York. Lindenhurst had one Stripped Maple (*Acer pensylvanicum*), and three Sugar Maples (*Acer Saccharum*). West Islip had two Sugar Maples, five Big Leaf Maples (*Acer macrophyllum*), and three Stripped Maples. Brentwood consisted of three Sugar Maples, three Big Leaf Maples, and three Stripped Maples.

Introduction:

According to the New York State Department of Environment Conservation, 18.9 million acres of New York's 30 million total acres is covered with forests (NYSDEC, 2015). This equals out to 62% of New York being forested. Within the 18.9 million acres of forests lives a vast number of diverse tree species. Due to New York's ideal dramatic climate changes, it enables a great variety of tree species to grow compared to other regions across the United States. To identify the tree species, dichotomous keys were utilized. A dichotomous key is a tool that allows the user to identify certain organisms based on answering a series of questions referring to the characteristics of the organism. It is evident in our research that tree species found in particular locations share similarities along with differences. We found different species of Maples across all three parks. All of the Maples identified are native to Long Island.

Method:

To conduct this experiment, 76 tree samples were collected. In each location, a branch from each and every tree in the parks were collected. Then using two dichotomous key, the samples were identified and recorded. The two dichotomous keys we utilized include the Virginia Tech Dendrology app and Peterson's Field Guide to Trees and Shrubs (Petrides, 1986). We surveyed that 20 different species lived amongst the three Suffolk County parks. At each location, the GPS coordinates were recorded. We used google to calculate the latitude and longitude of the parks.

Results:

Within three Suffolk County town parks, 20 different foliage species were identified. These species include: Mountain Maple (*Acer spicatum*), Live Oak (*Quercus virginiana*), Pin Oak (*Quercus palustris*), Black Walnut (*Juglans nigra*), Stripped Maple (*Acer pensylvanicum*), Box Elder (*Acer negundo*), Sugar Maple (*Acer saccharum*), Linden American (*Tilia americana*), American Sycamore (*Platanus occidentalis*), Pitch Pine (*Pinus rigida*), Big Leaf Maple (*Acer macrophyllum*), White Pine (*Pinus strobus*), Dwarf Alberta Spruce (*Pinus glauca*), English Oak (*Quercus robur*), Flowering

Dogwood (*Cornus florida*), Sugar Maple (*Acer saccharum*), Saucer Magnolia (*Magnolia x soulangeana*), Stripped Maple (*Acer pensylvanicum*), Northern White Cedar (*Thuja occidentalis*), Mountain Magnolia (*Magnolia fraseri*), Colorado Spruce (*Picea pungens*), and Scarlett Oak (*Quercus coccinea*). A total of 76 trees categorized into 20 different species were found.

(Table 1) Trees found in Lindenhurst, NY (11757)

Common Name	Scientific Name	Number of Trees Found	Native or Nonnative
Mountain Maple	*Acer spicatum*	3	Native
Live Oak	*Quercus virginiana*	1	Nonnative
Pin Oak	*Quercus palustris*	3	Native
Black Walnut	*Juglans nigra*	6	Native
Stripped Maple	*Acer pensylvanicum*	1	Native
Box Elder	*Acer negundo*	1	Native
Sugar Maple	*Acer saccharum*	3	Native
Linden American	*Tilia americana*	4	Native

Total: 21 Trees

*Latitude: 40.692298; Longitude: -73.373051

The above table shows that the following species were found on a property located in Lindenhurst, New York: Mountain Maple (*Acer spicatum*), Live Oak (*Quercus virginiana*), Pin Oak (*Quercus palustris*), Black Walnut (*Juglans nigra*), Stripped Maple (*Acer pensylvanicum*), Box Elder (*Acer negundo*), Sugar Maple (*Acer saccharum*), and Linden American (*Tilia americana*).

(Table 2) Trees found in West Islip, New York (11795)

Common Name	Scientific Name	Number of Trees Found	Native or Nonnative
American Sycamore	*Platanus occidentalis*	1	Native
Pitch Pine	*Pinus rigida*	4	Native
Sugar Maple	*Acer saccharum*	2	Native
Big Leaf Maple	*Acer macrophyllum*	5	Native
White Pine	*Pinus strobus*	1	Native
Dwarf Alberta Spruce	*Pincea glauca*	3	Nonnative
Stripped Maple	*Acer pensylvanicum*	3	Native

Total: 19 Trees

*Latitude: 40.730191; Longitude: -73.310952

The above table shows that the following species were found on a property located in West Islip, New York: American Sycamore (*Platanus occidentalis*), Pitch Pine (*Pinus rigida*), Sugar Maple (*Acer saccharum*), Big Leaf Maple (*Acer macrophyllum*), White Pine (*Pinus strobus*), Dwarf Alberta Spruce (*Pinus glauca*), and Stripped Maple (*Acer pensylvanicum*).

(Table 3) Trees found in Brentwood, New York (11717)

Common Name	Scientific Name	Number of Trees Found	Native or Nonnative
English Oak	*Quercus robur*	1	Nonnative
Flowering Dogwood	*Cornus florida*	4	Native

Sugar Maple	*Acer saccharum*	3	Native
Saucer Magnolia	*Magnolia x soulangeana*	1	Nonnative
Big Leaf Maple	*Acer macrophyllum*	3	Native
Stripped Maple	*Acer pensylvanicum*	3	Native
Northern White Cedar	*Thuja occidentalis*	7	Nonnative
Mountain Magnolia	*Magnolia fraseri*	7	Nonnative
Colorado Spruce	*Picea pungens*	6	Nonnative
Scarlett Oak	*Quercus coccinea*	1	Native

Total: 36 Trees

*Latitude: 40.792898; Longitude: -73.280869

The above table shows that the following tree species were found on a property located in Brentwood, New York: English Oak (*Quercus robur*), Flowering Dogwood (*Cornus florida*), Sugar Maple (*Acer saccharum*), Saucer Magnolia (*Magnolia x soulangeana*), Big Leaf Maple (*Acer macrophyllum*), Stripped Maple (*Acer pensylvanicum*), Northern White Cedar (*Thuja occidentalis*), Mountain Magnolia (*Magnolia fraseri*), Colorado Spruce (*Picea pungens*), and Scarlett Oak (*Quercus coccinea*).

When doing the survey area of Lindenhurst, it was an unexpected find that only four total trees of the species Linden American. Many years ago, the town of Lindenhurst was named due to the abundance of Linden trees (Epondunk, 2007). Finding more Black Walnut trees over Linden trees illustrates how geological appearances change over time. The Linden trees were most likely cut down to make room for housing developments. With this, new species were introduce while the native trees were destroyed.

Another significant observation includes the population of the Maple trees. In all three parks, the Stripped Maple and Sugar Maple were present. On two of the properties (Brentwood and West Islip), the Big Leaf Maple was present. The Sugar Maple is known as New York State's Tree symbol (NYSDEC, 2015). It is no surprise that this popular tree was found on all three properties.

Discussion:

According to a report by Barlett (2014), Nassau County displays a variation of Maple trees similar to Suffolk County. The trees in this report were recorded from the town of Westbury. The results included two Sycamore Maples (*Acer pseudoplatanus*), two Mountain Maples (*Acer Spicatum*), four Red Maples (*Acer rubrum*), and three Sugar Maples (*Acer saccharum*). The Sugar Maple was found amongst both the Suffolk and Nassau properties.

Another report by Dolan and Mian (2014) illustrates the vast variety of Maples on Long Island. Their results included seven Sycamore Maples (*Acer pseudoplatanus*), one Norway Maple (*Acer plaanoides*), three Mountain Maples (*Acer spicatum*), one Stripped Maple (*Acer pensylvanicum*), and three Silver Maples (*Acer saccharinum*). The results recorded are from the towns of Lindenuhrst, Amittyville, Deer Park, and Flushing.

Conclusion:

76 samples from three different towns in Suffolk County were collected and identified by using multiple dichotomous keys. These samples were collected from Lindenhurst, Brentwood, and West Islip (New York). A total of 20 different species were found. Based on the results, Sugar Maples were found on all three properties. Black Walnut was the most abundant tree on the Lindenhurst property, although the town's tree is the Linden American. The Linden tree was the second in most found. The Big Leaf Maple dominated the West Islip Property. This tree species was also found on the Brentwood

property but was not the dominant species. The Northern White Cedar and Mountain Magolia tied for being most popular on the Brentwood property. These trees were only found in this park. Out of the 76 tress identified, 26 of them were nonnative to Long Island. A total of six species, the Dwarf Alberta Spruce (*Pincea glauca*), English Oak (*Quercus robur*), Saucer Magnolia (*Magnolia x soulangeana*), Northern White Cedar (*Thuja occidentalis*), Mountain Magnolia (*Magnolia fraseri*), Colorado Spruce (*Picea pungens*), and Scarlett Oak (*Quercus coccinea*) were nonnative to Long Island. Despite the small size of Suffolk County, it is home to a large diversity of trees. This is illustrated by the results displaying 20 different tree species within three parks.

References:

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