Comparison of Soil Quality and Light Intensity under Trees and Strelitzia Areas at Wichienmatu School

Wichienmatu School

THE GLOBE PROGRAM
Global Learning and Observations to Benefit the Environment

Abstract

Research on Environmental Science on Comparison of Soil Quality and Light Intensity in Areas under Large Trees and Open Areas Planted with Strelitzia at Wichienmatu School, Trang Province Objectives 1). To compare the soil quality in the area under the big trees and the open area planted with Strelitzia.2). To compare light intensity in areas under large trees and open areas planted with Strelitzia. 3). To study the relationship between soil quality and light intensity in areas under large trees and open areas with suitable environments for growing Strelitzia. The study was conducted in the area under large trees and open areas within Wichienmatu School, Trang Province by measuring soil structure, soil moisture, acidity, alkalinity and light intensity, and then recording the measurement results and comparing them to analyze the differences in soil quality and light intensity. According to the study, the area under the big trees has a nodular appearance. It has low moisture value, alkaline soil, and low light intensity. While the soil in the open area is also nodular soil. High humidity value. The soil has alkaline properties and high light intensity.
Keywords: Paradise Bird, Soil Quality Light Intensity .

Research Question

1. Is there a difference in soil quality between areas under large trees and open areas where Strelitzia is grown? If so, how do they differ?
2. Is there a difference in light intensity between areas under large trees and open areas where Strelitzia is grown? If so, how do they differ?
3. Is there a relationship between soil quality and light intensity in areas under large trees and open areas where Strelitzia is grown? If so, how does this relationship differ between the two areas?

Introduction

Recommendations Based on the Study on Soil Quality and Light Intensity for Growing Strelitzia at Wichienmatu School, Trang Province

Based on the findings of this study, clear differences were identified in soil quality and light intensity between areas under large trees and open areas where Strelitzia (Paradise Bird) is grown. These environmental differences directly influence plant growth and the suitability of each area. Therefore, several recommendations are proposed based on the results.

First, Strelitzia should preferably be planted in open areas rather than under large trees. Open areas provide higher light intensity, which is essential for photosynthesis and healthy plant development. In addition, soil moisture in open areas was found to be higher, creating more favorable conditions for the growth of Strelitzia compared to shaded areas under large trees.Second, if planting in shaded areas under large trees cannot be avoided, soil management practices should be improved. Adding organic matter such as compost or manure can help increase soil moisture and enhance soil structure. Furthermore, pruning large tree branches may help reduce shading and allow more sunlight to reach the soil surface.Third, regular monitoring of soil moisture and soil pH is recommended in both planting areas. Although soils in both locations were alkaline, maintaining suitable moisture levels is crucial for plant growth. Special attention should be given to shaded areas, where soil moisture tends to be lower.Fourth, light intensity management is an important factor. Since light intensity under large trees was significantly lower, relocating plants or reducing shade should be considered to ensure adequate light exposure for optimal growth.Finally, the data collection methods used in this study—such as soil structure analysis, soil moisture and pH measurement, and light intensity monitoring—should be applied in future environmental studies and school gardening projects. These methods can help identify appropriate planting environments.In conclusion, open areas at Wichienmatu School are more suitable for growing Strelitzia due to better soil moisture conditions and higher light intensity. Environmental factors should always be considered to support sustainable plant growth.

Research Methods

Study Area

This research was conducted at Wichienmatu School, Khok Lo Sub-district, Mueang District, Trang Province, Thailand. The study area is located at latitude 7.504082° N and longitude 99.628574° E.

Materials and equipment for conducting research 1. Materials and equipment
1 Needle Soil Meter 3-in-1 Meter
2 Soil Fixation Calibration Plate
3 CU Smart Lens

Carrying out Investigations

How to Conduct the Research .

1.Data Collection on Soil Quality in Areas Where Strelitzia Is Grown

Soil properties were collected following the GLOBE Program method to study soil conditions in areas under large trees and open areas where Strelitzia is grown. Three soil properties were examined: soil moisture, soil acidity (pH), and soil structure as follows:

1.1 Soil Structure in Areas Where Strelitzia Is Grown.

- Soil samples were collected from two study sites: the area under large trees and the open area where Strelitzia was planted.
- At each study site, soil samples were collected from two sampling points and placed on a plate. Soil structure was analyzed using the CU Smart Lens application. Photographs of the soil samples were taken and compared with a soil texture (soil fixation) calibration plate. The soil structure was then recorded.

1.2 Measurement of Soil Moisture in Areas Where Strelitzia Is Grown .

- Two soil sampling points were selected in the study area: the area under large trees and the open area where Strelitzia was planted.
- Soil moisture was measured using a 3-in-1 needle soil meter.
- The moisture value was read from the instrument. Each measurement was repeated three times to calculate the average value, and the results were recorded.

1.3 Measurement of Soil Acidity and Alkalinity in Areas Where Strelitzia Is Grown

- Two soil sampling points were selected in the study area: the area under large trees and the open area where Strelitzia was planted.
- Soil acidity and alkalinity (pH) were measured using a 3-in-1 needle soil meter.
- The pH value was read from the instrument dial. Each measurement was repeated three times to determine the average value, and the results were recorded.

2. Collecting Light Intensity Data in the Area Where Strelitzia Is Planted

1. Identify two data collection points in the study area: one under a large tree and one in an open area where Strelitzia is planted.
2. Place the light intensity measuring device at each data collection point, wait for the reading to stabilize, and record the light intensity value displayed on the instrument.
3. Repeat the measurement three times at each point to calculate the average value, and record the results.

3 . Relationship Between Soil Quality and Light Intensity in Areas Under Large Trees and Open Areas Where Strelitzia Is Planted

Soil Quality Analysis: Soil moisture, soil pH (acidity and alkalinity), and light intensity were analyzed.

The data were analyzed using the mean and standard deviation to examine the relationship between soil quality and light intensity in areas where Strelitzia was planted.

GLOBE Badges

Be a Earth system scientists

This research explores the relationship between soil quality and light intensity and how these factors affect the growth of plants in the Strelitzia genus. The study demonstrates the interaction between soil properties and sunlight, revealing that these components influence growth in distinct ways and have a significant connection to the global ecosystem.

Be a Collaborator

This research was conducted collaboratively by all group members. Each member participated in data collection, measurement, and analysis, and the results were discussed collectively to successfully complete the study.

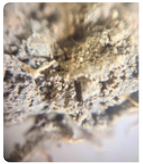
Be a Data Scientist

Quantitative data, including soil moisture, soil pH, and light intensity, were collected and analyzed. Averages were calculated and presented in tables and charts to compare environmental conditions across different areas.

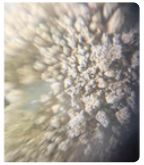
Results

According to the study on soil quality and light intensity in relation to the environment of Strelitzia in the area surrounding at Wichienmatu School, Trang Province, the results are as follows.

1. Characteristics of the soil structure in the area where the paradise bird is planted .



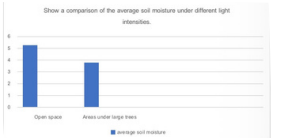
Picture 1 shows the characteristics of nodular soil in the area beneath a large tree where Strelitzia is planted.



Picture 2 shows the appearance of nodular soil in the open area where Strelitzia is grown.

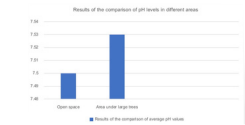
2. Study of measuring humidity in the area where the paradise is planted Table 1 shows a comparison of humidity in the area where the paradise is grown.

No.	Open space	Area under large trees
1	1.9	2
2	10	5
3	3.9	4.4
Average	5.27	3.8



3. Acid-Alkalinity (pH) Measurement in the Area Where Strelitzia Is Plante Table 2 shows a comparison of soil pH values in the area where Strelitzia is grown.

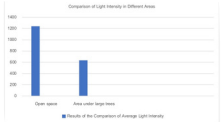
No.	Open space	Area under large trees
1	7.9	7.8
2	6.8	6.9
3	7.8	7.9
Average	7.5	7.53



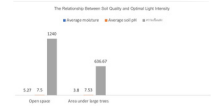
4. Measuring Light Intensity in the Area Where Strelitzia Is Planted

Table 3 shows a comparison of light intensity (lux) in the area where Strelitzia is grown

No.	Open space	Area under large trees
1	1700	910
2	1100	400
3	920	600
Average	1240	636.67



5. A Study of the Relationship Between Soil Quality and Optimal Light Intensity in the Area Where Strelitzia Is Plante



Discussion

The relationship between soil quality and light intensity was studied in areas under large trees and open areas where Strelitzia is grown within Wichienmatu School, Trang Province. The results indicated differences in soil characteristics between the two areas including soil moisture, soil pH (acidity and alkalinity), and light intensity.

Conclusions

The findings showed that the open area was more suitable for growing Strelitzia than the area under large trees. This suitability was due to more appropriate average soil moisture, soil acidity, alkalinity, and light intensity for plant growth. In contrast, the area under large trees was less suitable for the cultivation of Strelitzia because the environmental conditions did not adequately support its growth.These differences in soil quality and light intensity reflect that environmental conditions vary between areas and influence the suitability of each area by growing Strelitzia.

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