

Environmental Science Research Report

Title: Comparison of Soil Quality and Light Intensity in Areas Under Large Trees and Open Areas Planted with Strelitzia at Wichienmatu School, Trang Province

Organizer : Mr. Anavin Srisawat, Miss Panatda Na Pattalung, Miss Lucksaminun Yookong

Grade Level : Secondary 5

Advisor : Mrs. Khwanjai Karnchanasrimak, Miss Naeriya Tonkrongchan, Miss Chularat Singkaew

School : Wichienmatu

Consultant Scientist : Dr. Apirak Songrak

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. There are three objectives as follows: 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 and 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

Origin and significance

Strelitzia is an ornamental flowering plant of high international value, distinguished by its bird-like flowers and bright colors, which make it widely popular. However, the cultivation of high-quality *Strelitzia* plants is influenced by several environmental factors. Soil quality is particularly important because *Strelitzia* has a succulent root system that is highly sensitive to soil conditions. When the soil is too compact or poorly drained, the roots may suffer from oxygen deficiency and are prone to rotting. In addition, sunlight is a crucial factor affecting the growth of *Strelitzia*, as the plant requires full sunlight for proper growth and development. Therefore, understanding the relationship between light and soil quality is essential for improving the growth of *Strelitzia*. For this reason, this study was conducted to investigate the relationship between light intensity and soil quality affecting the growth of *Strelitzia* plants at Wichienmatu School.

Research Questions

1. Is there a difference in soil quality between areas under large trees and open areas where *Strelitzia* is grown?
2. Is there a difference in light intensity between areas under large trees and open areas where *Strelitzia* is grown?
3. Is there a relationship between soil quality and light intensity in areas under large trees and open areas where *Strelitzia* is grown? How does this relationship differ between the two areas?

Research Hypotheses

Hypothesis 1 Soil quality in areas under large trees and open areas where *Strelitzia* is grown is significantly different.

Independent Variable : Planting area (area under large trees and open area)

Dependent Variable : Soil quality

Control Variables : Number of measurement points, measurement interval,
measurement instruments

Hypothesis 2 Light intensity in areas under large trees and open areas where *Strelitzia* is grown is significantly different.

Independent Variable : Planting area (area under large trees and open area)

Dependent Variable : Light intensity

Control Variables : Number of measurement points, measurement interval,
measurement instruments

Hypothesis 3 The relationship between soil quality and light intensity in areas under large trees and open areas where *Strelitzia* is grown is different.

Independent Variable : Planting area (area under large trees and open area)

Dependent Variable : Relationship between soil quality and light intensity

Control Variables : Number of measurement points, measurement interval,
measurement instruments

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

1.1 Needle Soil Meter 3-in-1 Meter

1.2 Soil Fixation Calibration Plate

1.3 CU Smart Lens

2. How to Conduct the Research

2.1 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 described below.

2.1.1 Soil Structure in Areas Where Strelitzia Is Grown

- Soil samples were collected from two study sites as 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.

2.1.2 Measurement of Soil Moisture in Areas Where Strelitzia Is Grown

- Two soil sampling points were selected in the study area for 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.

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

- Two soil sampling points were selected in the study area as 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.

2.2 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.

2.3 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.

Research 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 *Strelitzia* is cultivated.



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

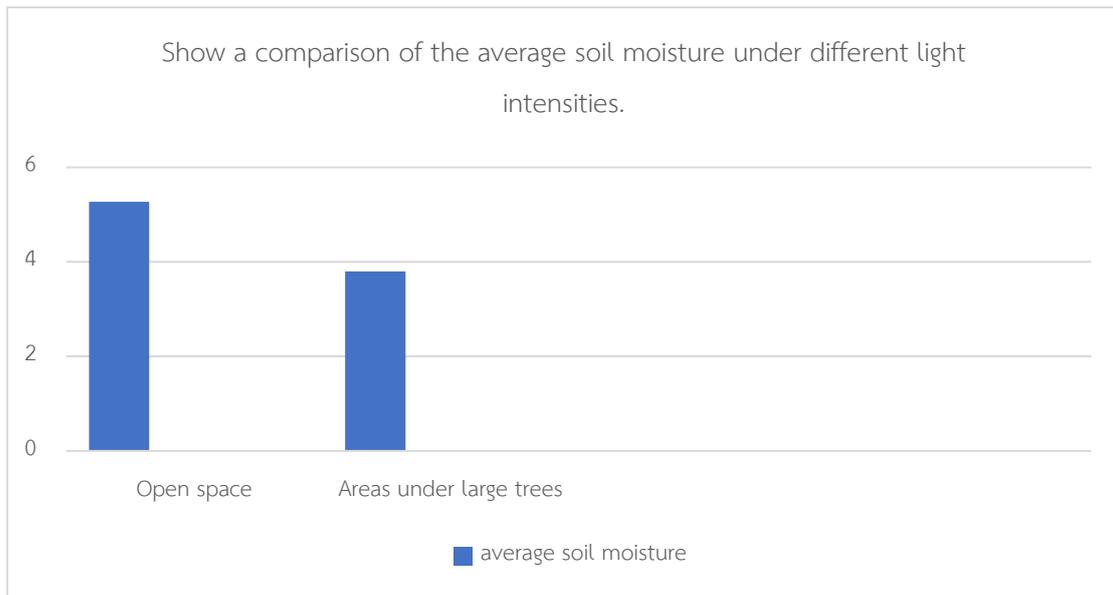


Picture 2 shows the appearance of nodular soil in the open area where *Strelitzia* is grown.

2. Study of measuring humidity in the area where the paradise is planted

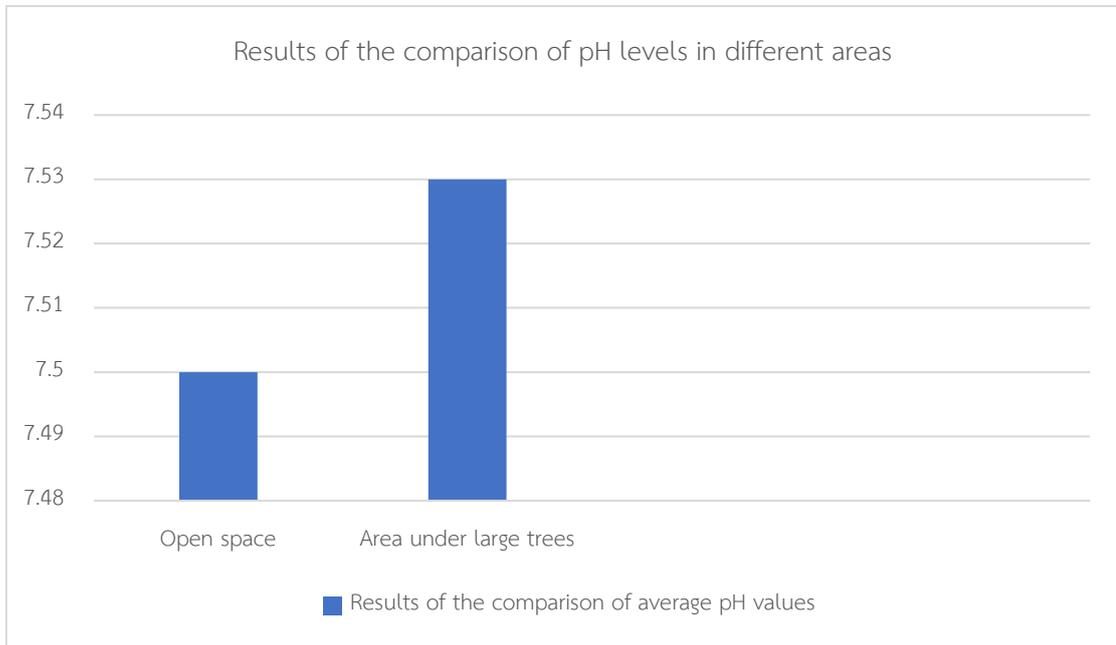
Table 1 shows a comparison of humidity in the area where the paradise is grown.

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 Planted
Table 2 shows a comparison of soil pH values in the area where Strelitzia is grown.

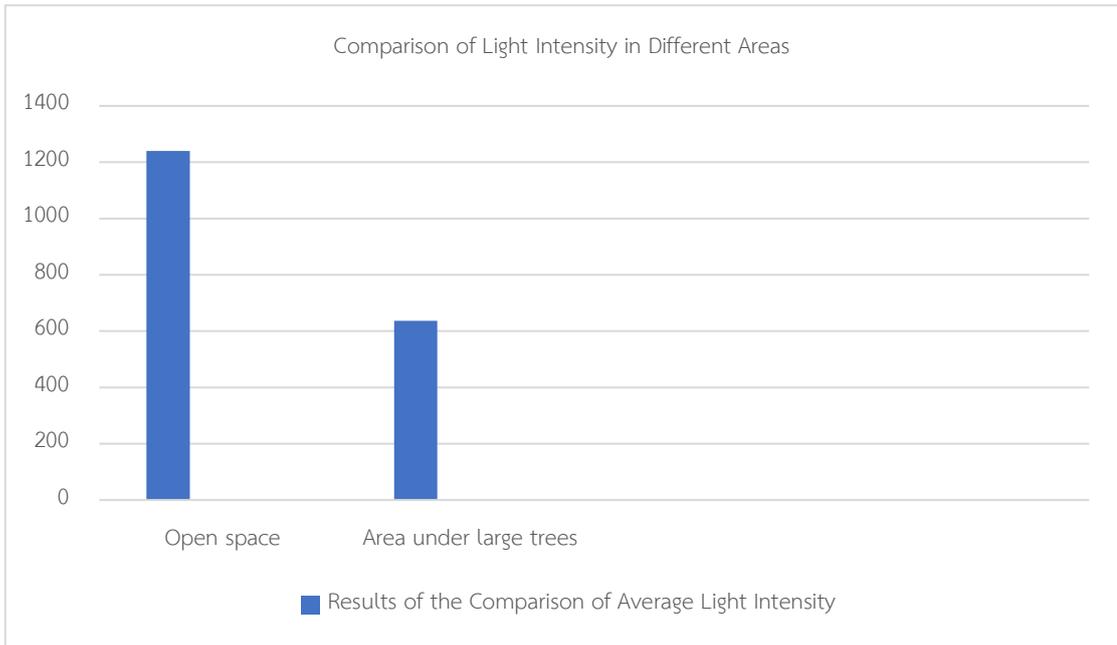
No.	Open space	Area under large trees
1	7.9	7.8
2	6.8	6.9
3	7.8	7.9
Average	7.5	7.53



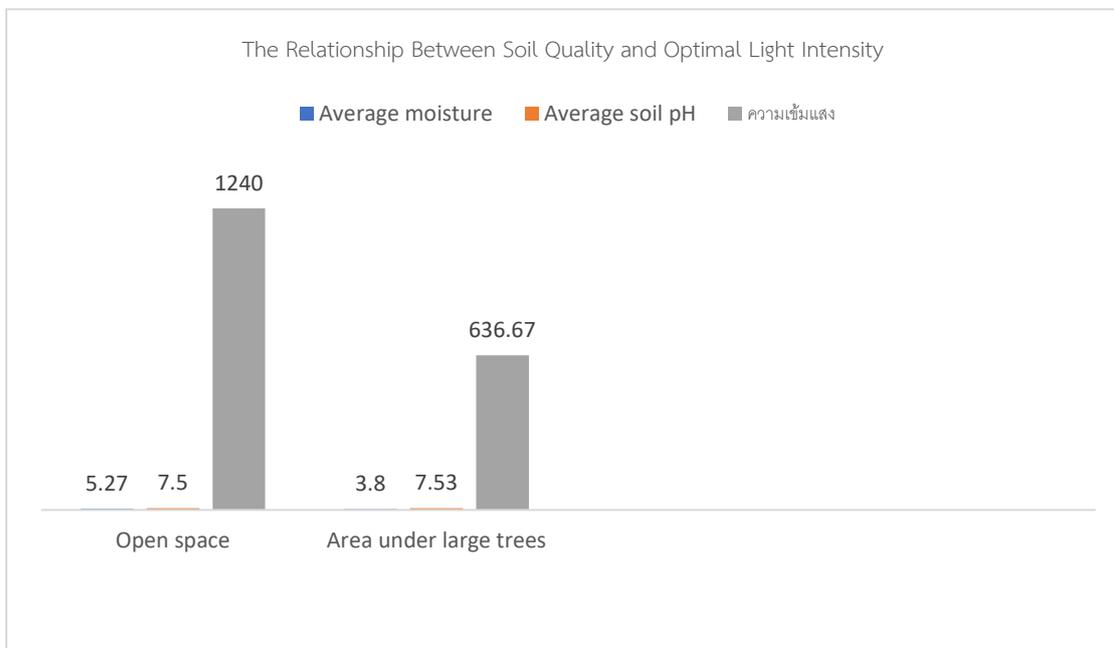
4. Measuring Light Intensity in the Area Where Strelitzia Is Planted

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 Planted



Summary and Discussion of the Research Results

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.

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 and 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 on environmental conditions vary between areas and influence the suitability of each area for growing *Strelitzia*.

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