



Research Report

Title:

*A Study of Soil Quality and Air Quality Affecting the Growth of
Termite Mushrooms*

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Abstract

This environmental science research aimed to study soil quality and air quality affecting the growth of termite mushrooms at Ban Thung Na School, Trang Province. The objectives of this study were:

1. to compare soil quality affecting the growth of termite mushrooms in open areas and areas covered with trees;
2. to compare air quality affecting the growth of termite mushrooms in open areas and areas covered with trees; and
3. to study the density of termite mushrooms in both areas.

Soil quality was examined in terms of soil structure, soil temperature, soil moisture, and soil pH, while air quality was examined in terms of air temperature and relative humidity. The results showed that soil in areas covered with trees had a granular structure, lower soil temperature, lower pH value, and higher soil moisture than open areas. In addition, air temperature was lower and relative humidity was higher in areas covered with trees. These environmental conditions resulted in a higher density of termite mushrooms in areas covered with trees.

Keywords : Soil quality, soil structure, soil temperature, soil moisture, soil pH



Acknowledgements

This environmental science research entitled “*A Study of Soil Quality and Air Quality Affecting the Growth of Termite Mushrooms*” conducted at Ban Thung Na School, Trang Province, was successfully completed with the kind support, guidance, and valuable advice from many individuals.

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The Researchers



Contents

	Page
abstract	A
acknowledgements	B
Contents	C
Introduction	1
Research Questions	1
Research Hypotheses	2
Study Area	2
Data Collection	2
Duration of Data Collection	2
Materials and Equipment	3
Research Methodology	3
Research Results	4
Conclusions and Discussion	8
References	8
Appendices	9



Introduction

Termite mushrooms are wild mushrooms that grow well under natural conditions. They require suitable moisture and temperature for growth. These mushrooms have a distinct appearance with a stalk and cap, large fruiting bodies, thick bases, and a unique aroma. They are commonly found growing near termite mounds and are therefore locally known as “termite mushrooms.”

The germination and growth of termite mushrooms depend on environmental conditions, particularly soil quality, which serves as a source of nutrients and moisture, as well as air quality, which influences temperature and environmental circulation. In the mixed garden area behind the school building of Ban Thung Na School, termite mushrooms have been observed to grow annually in two areas: one area covered with trees where mushrooms grow every year, and an open area where mushrooms grow only in some years. This difference reflects variations in environmental factors such as moisture, temperature, shading, and soil characteristics, which may directly affect the growth of termite mushrooms.

Based on these continuous observations, the researchers became interested in studying soil quality and air quality affecting the growth of termite mushrooms in the area of Ban Thung Na School, Trang Province. The purpose of this study was to compare the environmental conditions of the two areas and to analyze the relationship between environmental factors and the occurrence of termite mushrooms. This study not only enhances scientific understanding of the local ecosystem but also promotes scientific process skills among students, including observation, hypothesis formulation, data collection, data analysis, and systematic conclusion.

Furthermore, the results of this research can be applied as guidelines for natural resource conservation within the school area, environmental management to support biodiversity, and the integration of environmental science knowledge with real-life learning. This will help cultivate awareness of conservation and sustainable use of resources among students and the surrounding community.

Research Questions

1. Does the soil structure in areas where termite mushrooms grow differ between open areas and areas covered with trees? How?
2. Does the soil temperature in areas where termite mushrooms grow differ between open areas and areas covered with trees? How?



3. Does the soil moisture in areas where termite mushrooms grow differ between open areas and areas covered with trees? How?
4. Does the soil pH in areas where termite mushrooms grow differ between open areas and areas covered with trees? How?
5. Does the air temperature in areas where termite mushrooms grow differ between open areas and areas covered with trees? How?
6. Does the relative humidity of the air in areas where termite mushrooms grow differ between open areas and areas covered with trees? How?

Research Hypotheses

1. The soil structure in areas where termite mushrooms grow differs between open areas and areas covered with trees.
2. The soil temperature in areas where termite mushrooms grow differs between open areas and areas covered with trees.
3. The soil moisture in areas where termite mushrooms grow differs between open areas and areas covered with trees.
4. The soil pH in areas where termite mushrooms grow differs between open areas and areas covered with trees.
5. The air temperature in areas where termite mushrooms grow differs between open areas and areas covered with trees.
6. The relative humidity of the air in areas where termite mushrooms grow differs between open areas and areas covered with trees.

Study Area

The study area was Ban Thung Na School, Mueang District, Trang Province, located at latitude 7.6942 and longitude 99.7396. The area is characterized by a small earthen mound with no grass covering the ground surface, and a termite mound located near the soil mound.

Two study sites were identified:

1. an area covered with trees, and
2. an open area.

Soil quality and air quality measurements were conducted in areas where termite mushrooms were observed to grow.



Data Collection

Data were collected according to standard protocols for soil and air measurements. Soil quality measurements included soil structure, soil temperature, soil moisture, and soil pH. Air quality measurements included air temperature and relative humidity.

Duration of Data Collection

Data were collected from September to November 2025.

Materials and Equipment

1. Thermometer
2. Hygrometer
3. Multi-purpose measuring device
4. CU Smart Lens
5. GLOBE Observer application

Research Methodology

Part 1: Study of Soil Structure in Areas Where Termite Mushrooms Grow in Open Areas and Areas Covered with Trees

Soil samples were collected to study the physical characteristics of the soil, focusing on soil structure. The soil structure in areas where termite mushrooms grew in open areas was compared with that in areas covered with trees using a soil structure chart. Observations were recorded and results were documented.

Part 2: Study of Soil Temperature in Areas Where Termite Mushrooms Grow in Open Areas and Areas Covered with Trees

Soil temperature was measured using a soil thermometer inserted at a depth of 10 centimeters. Soil temperature readings were recorded three times in areas where termite mushrooms grew in both open areas and areas covered with trees. Observations were recorded and results were documented.

Part 3: Study of Soil Moisture in Areas Where Termite Mushrooms Grow in Open Areas and Areas Covered with Trees

Soil moisture was measured using a multi-purpose measuring device at a depth of 5 centimeters. Soil moisture readings were recorded three times in areas where termite mushrooms grew in both open areas and areas covered with trees. Observations were recorded and results were documented.

Part 4: Study of Soil pH in Areas Where Termite Mushrooms Grow in Open Areas and Areas Covered with Trees

Soil pH was measured using a multi-purpose measuring device at a depth of 5 centimeters. Soil pH readings were recorded three times in areas where termite mushrooms grew in both open areas and areas covered with trees.

Part 5: Study of Air Temperature in Areas Where Termite Mushrooms Grow in Open Areas and Areas Covered with Trees

A hygrometer was installed in areas where termite mushrooms grew in both open areas and areas covered with trees. The dry-bulb temperature was recorded at noon, and the results were documented.

Part 6: Study of Relative Humidity of the Air in Areas Where Termite Mushrooms Grow in Open Areas and Areas Covered with Trees

A hygrometer was installed in areas where termite mushrooms grew in both open areas and areas covered with trees. Dry-bulb and wet-bulb temperatures were recorded at noon. The relative humidity of the air was calculated and the results were documented.

Research Results

The results of the study entitled “A Study of Soil Quality and Air Quality Affecting the Growth of Termite Mushrooms at Ban Thung Na School, Trang Province” are presented as follows.

Table 1: Soil Structure in Areas Where Termite Mushrooms Grow in Open Areas and Areas Covered with Trees

Study Area Areas Where Termite Mushrooms Grow	Results	
	Soil type	Sample picture
Open area	Round lump	

Study Area Areas Where Termite Mushrooms Grow	Results	
	Soil type	Sample picture
Area covered with trees	Round lump	

Table 2: Average Soil Temperature in Areas Where Termite Mushrooms Grow in Open Areas and Areas Covered with Trees

Study Area Areas Where Termite Mushrooms Grow	Average Soil Temperature (°C)
Open area	29
Area covered with trees	27

Figure 1: Soil Temperature in Areas Where Termite Mushrooms Grow in Open Areas and Areas Covered with Trees

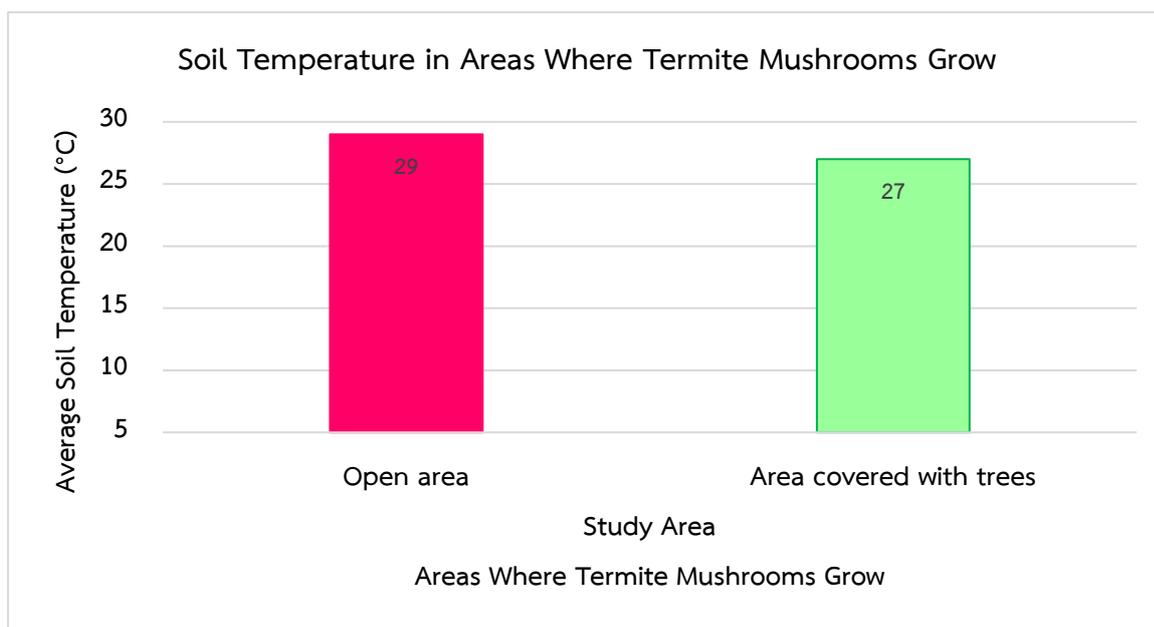


Table 3: Soil Moisture in Areas Where Termite Mushrooms Grow in Open Areas and Areas Covered with Trees

Study Area Areas Where Termite Mushrooms Grow	Soil Moisture (%)
Open area	55
Area covered with trees	70

Figure 2: Soil Moisture in Areas Where Termite Mushrooms Grow in Open Areas and Areas Covered with Trees

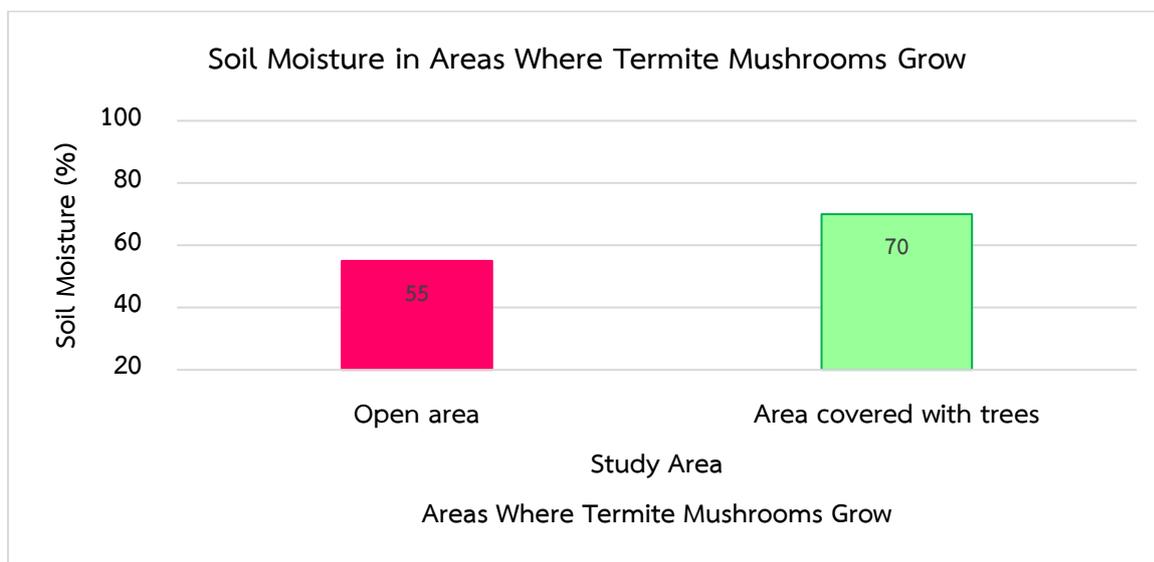


Table 4: Soil pH in Areas Where Termite Mushrooms Grow in Open Areas and Areas Covered with Trees

Study Area Areas Where Termite Mushrooms Grow	Soil pH
Open area	6.33
Area covered with trees	5.66

Figure 3: Soil pH in Areas Where Termite Mushrooms Grow in Open Areas and Areas Covered with Trees

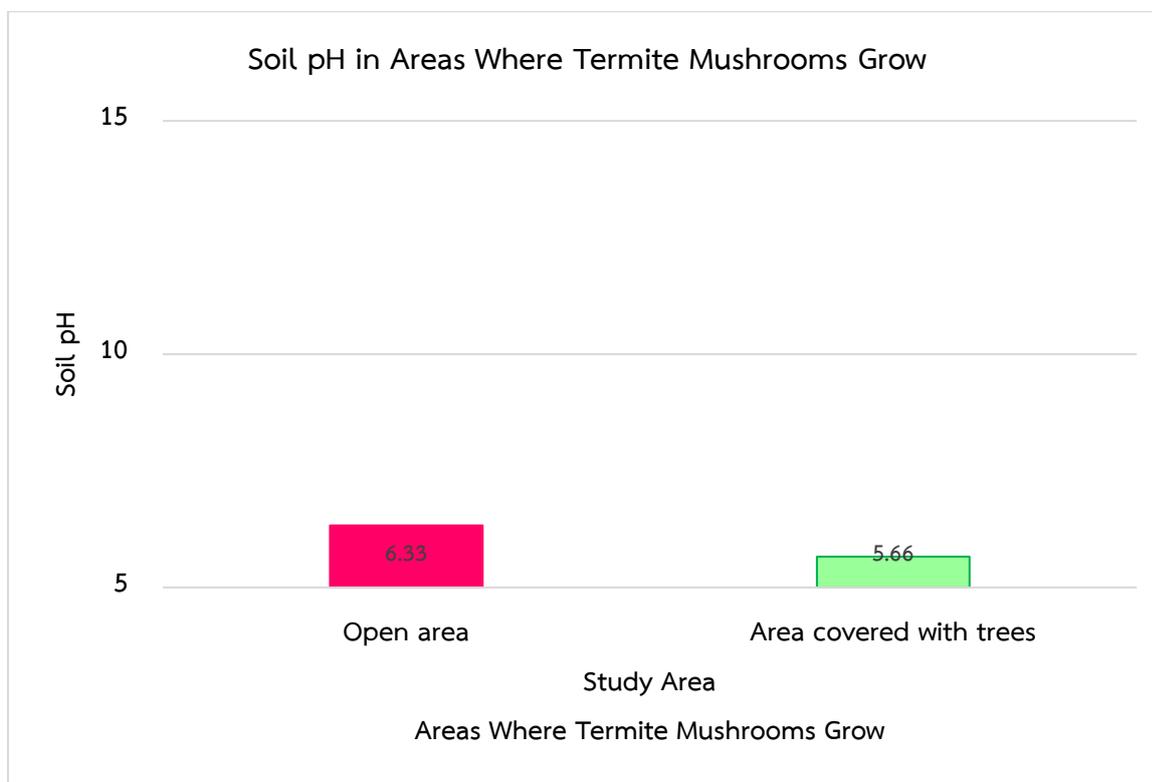


Table 5: Air Temperature in Areas Where Termite Mushrooms Grow in Open Areas and Areas Covered with Trees

Study Area Areas Where Termite Mushrooms Grow	Air Temperature
Open area	29.66
Area covered with trees	27.33

Figure 4: Air Temperature in Areas Where Termite Mushrooms Grow in Open Areas and Areas Covered with Trees

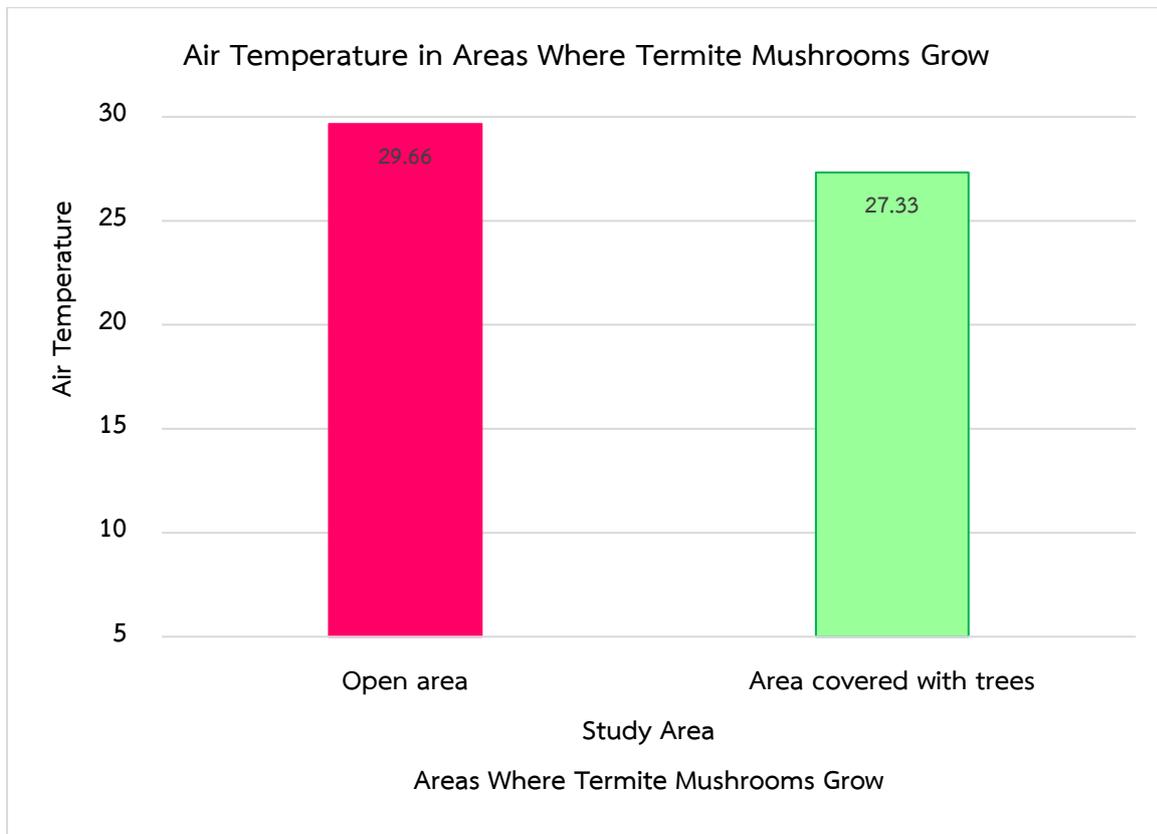


Table 6: Relative Humidity of Air in Areas Where Termite Mushrooms Grow in Open Areas and Areas Covered with Trees

Study Area Areas Where Termite Mushrooms Grow	Relative Humidity of Air (%)
Open area	75
Area covered with trees	85

Figure 5: Relative Humidity of Air in Areas Where Termite Mushrooms Grow in Open Areas and Areas Covered with Trees

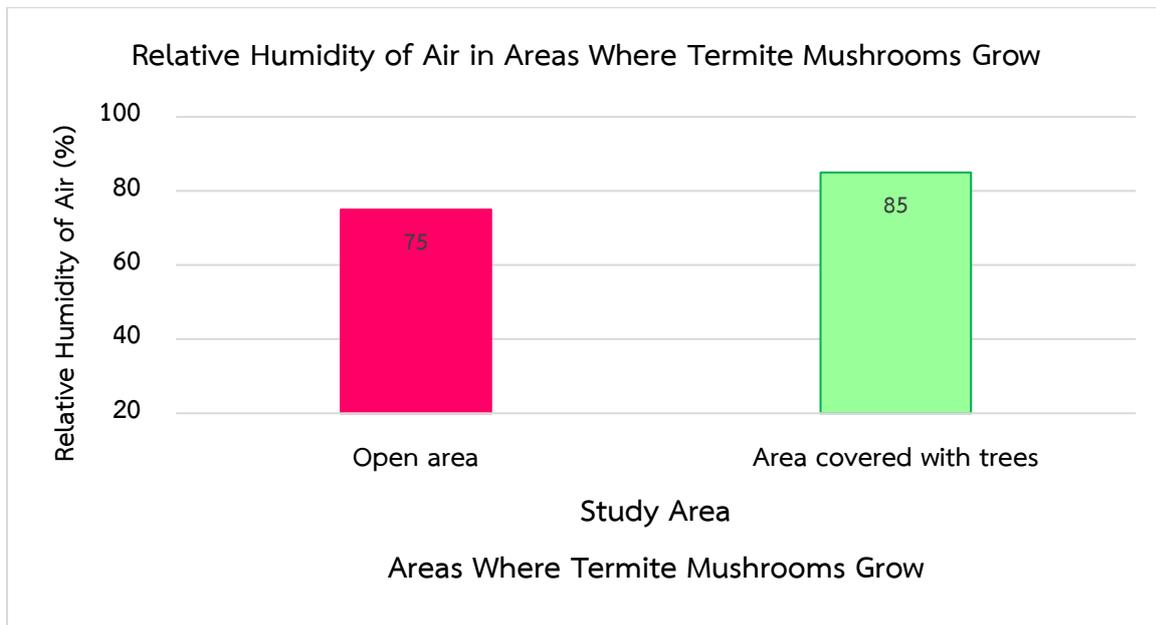
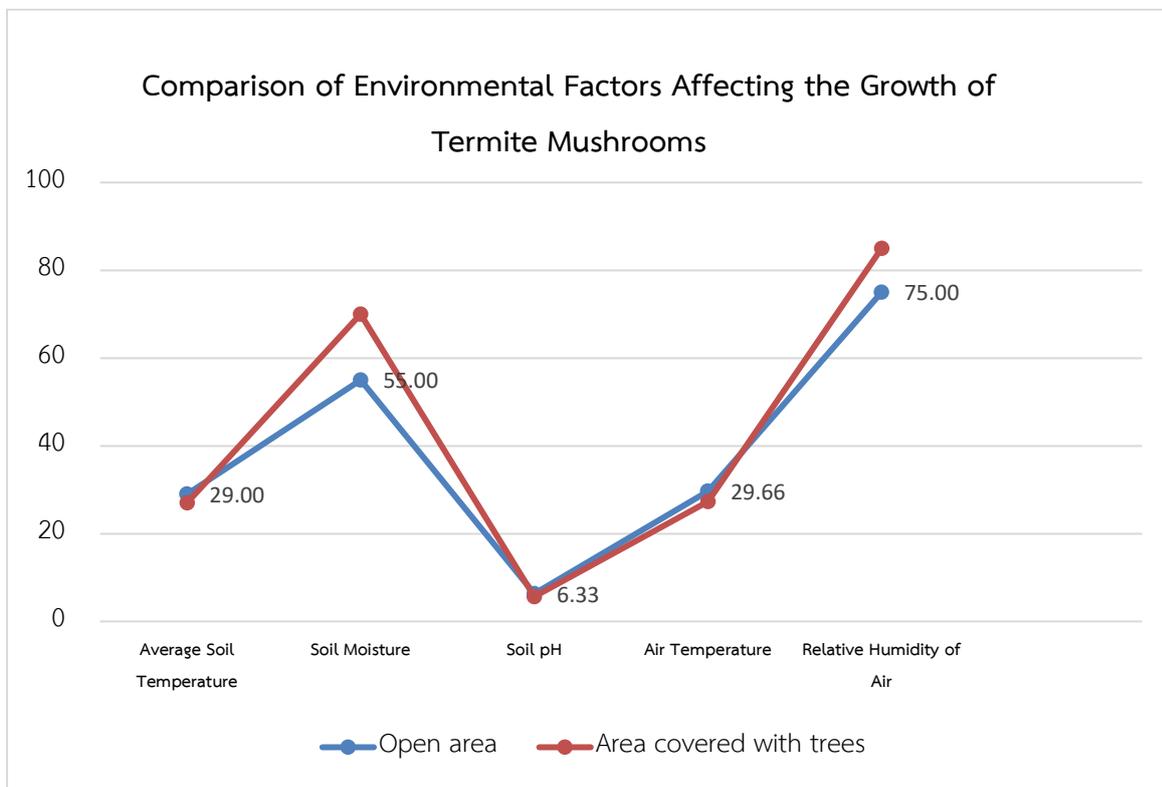


Figure 6: Comparison of Environmental Factors Affecting the Growth of Termite Mushrooms in Open Areas and Areas Covered with Trees





Conclusions and Discussion

The results of this environmental science research on soil quality and air quality affecting the growth of termite mushrooms at Ban Thung Na School, Trang Province, revealed that soil in areas covered with trees had a granular structure, lower soil temperature, and higher soil moisture than soil in open areas. In addition, air temperature was lower and relative humidity was higher in areas covered with trees.

These environmental conditions contributed to a higher density of termite mushrooms in areas covered with trees, indicating that shaded environments with suitable moisture and temperature are more favorable for the growth of termite mushrooms.

References

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- Thipaporn Panyaphu. (2013, February 6). *Soil components and soil suitable for cultivation*.
- Soil Survey Division Staff. (1993). *Soil Survey Manual*. United States Department of Agriculture, pp. 63–65.



Activity pictures

A Study of Soil Quality and Air Quality Affecting the Growth of Termite Mushrooms



Research Methodology

Study of Soil Structure in Areas Where Termite Mushrooms Grow in Open Areas and Areas Covered with Trees



Study of Soil Temperature in Areas Where Termite Mushrooms Grow in Open Areas and Areas Covered with Trees



Study of Soil Moisture in Areas Where Termite Mushrooms Grow in Open Areas and Areas Covered with Trees



Study of Soil pH in Areas Where Termite Mushrooms Grow in Open Areas and Areas Covered with Tree



Study of Air Temperature in Areas Where Termite Mushrooms Grow in Open Areas and Areas Covered with Trees



Study of Relative Humidity of the Air in Areas Where Termite Mushrooms Grow in Open Areas and Areas Covered with Trees



