



A STUDY ON THE DIVERSITY OF BRYOPHYTES IN WICHENMATU SCHOOL, MUEANG DISTRICT, TRANG PROVINCE



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Determination of Study Points

Area within Wichianmat School, Mueang District, Trang Province (Latitude 7.50432, Longitude 99.62936)

Abstract

The study of the environmental factors affecting the diversity of bryophytes in Wichienmatu School, Mueang District, Trang Province, aimed to examine how the environment influences the diversity of bryophytes within the school. The study found that the factors affecting bryophytes in Wichienmatu School, Mueang District, Trang Province, are weather conditions and humidity levels in each area. The bryophytes found within the school were classified as follows : On bricks, the average humidity was 2.83, and the average temperature was 30°C, with 3 species of bryophytes. On soil, the average humidity was 5.50, and the average temperature was 29.66°C, with 7 species of bryophytes. On rocks, the average humidity was 1.67, and the average temperature was 30.33°C, with 1 species of bryophyte. On trees, the average humidity was 3.17, and the average temperature was 30°C, with 6 species of bryophytes. On plant pots, the average humidity was 1, and the average temperature was 30.33°C, with 1 species of bryophyte. Thus, the diversity of bryophytes is influenced by environmental factors such as sunlight exposure and humidity levels in each area. Areas with higher humidity and suitable weather conditions, such as trees, tend to have a higher diversity of bryophytes. When checking other areas with similar characteristics, bryophytes of the same or similar species were found. The study concluded that humidity and temperature significantly impact the growth of bryophytes, and areas with similar characteristics tend to support similar species of bryophytes, with bryophyte density increasing in such areas. This study identified factors that influence the growth and species diversity of bryophytes.

Introduction

Bryophytes are the most diverse group of non-vascular plants, with approximately 13,000 species found worldwide (Goffinet et al., 2008) and around 8,000 species recorded in tropical regions (Frahm et al., 2003). Bryophytes can grow in various habitats, including soil, rocks, water, tree bark, and even animal dung. They play a crucial role in ecosystems as a source of food and habitat for small organisms. Additionally, they influence the weathering of rocks and soil, contributing to ecological succession (Gradstein et al., 2001). Bryophytes are also effective bioindicators of environmental quality due to their ability to absorb water and exchange gases directly through leaf surfaces, making them highly responsive to environmental changes such as temperature, soil acidity, air pollution, and heavy metals (Vanderpoorten & Goffinet, 2009). Moreover, bryophytes are important for various applications, including decorative landscaping (Ando & Matsuo, 1984) and medical uses (Beike et al., 2010), such as antimicrobial and biopharmaceutical treatments. For these reasons, the researchers are interested in studying the diversity and distribution of bryophytes. Wichienmatu School in Trang Province provides a suitable environment for such a study, as it has a well-preserved ecosystem with numerous trees. Furthermore, the study is conducted during the rainy season, when high humidity promotes the growth of mosses in various areas, including soil, rocks, bricks, and tree surfaces.

Research Questions

Does the environment affect the diversity of bryophytes in Wichienmatu School?

Research Hypothesis

Different environments affect the diversity of bryophytes in Wichienmatu School differently.

Materials and equipment



Research Results

Table 1 shows the geographical coordinates where the bryophyte study was conducted.

Study area	Geographical coordinates	
	Latitude (N)	Longitude (E)
Wichienmatu School, Trang Province	7.50432	99.62936

Table 3 shows the species and moisture content of bryophytes.

STUDY AREA	Bryophyte moisture content			
	First Trial	Second Trial	Third Trial	Average
ON ROCKS	2.0	1.0	2.0	1.67
ON PLANT POTS	2.0	8.0	6.5	5.50
ON THE BRICK	0.5	4.0	4.0	2.83
ON THE TREE	3.5	2.0	4.0	3.17
ON FLOWER POTS	1.0	1.0	1.0	1.00

From Table 3, the moisture content in the areas where bryophytes were studied shows that the area with the highest moisture content is on the soil, with an average moisture value of 5.50. The second-highest is on trees, with an average moisture value of 3.17. The area on bricks has an average moisture value of 2.83, followed by the area on rocks, with an average moisture value of 1.67. The lowest moisture content is found on plant pots, with an average moisture value of 1.00.

Table 4 shows the temperature of bryophytes.

STUDY AREA	Bryophyte Temperature			
	First Trial	Second Trial	Third Trial	Average
ON ROCKS	30	30	31	30.33
ON PLANT POTS	30	29	30	29.66
ON THE BRICK	30	30	30	30
ON THE TREE	29	31	30	30
ON A FLOWER POTS	29	30	32	30.33

From Table 4, it can be observed that the area with the highest temperature is on the rocks and plant pots, with a temperature of 30.33°C. The second-highest temperature is on the bricks, with an average temperature of 30°C, followed by the trees, also with an average temperature of 30°C. The lowest temperature was found on the soil, with a temperature of 29.66°C.

Table 2 shows the number and types of bryophytes.

Study area	Number of Bryophyte Species	Bryophyte Species
On Bricks	3 species	• <i>Syntrichia papillosa</i> • <i>Tortula obtusifolia</i> • <i>Plagiommium cuspidatum</i>

Study area	Number of Bryophyte Species	Bryophyte Species
On Soil	7 species	• <i>Sphagnum</i> • <i>Hymenosyllum recurvirostrum</i> • <i>Sphagnales</i> • <i>Fissidens nobilis Griff</i> • <i>Syntrichia ruralis</i> • <i>Mnium hornum</i> • <i>Orthotrichum lyelli</i>
On Rocks	1 species	• <i>Sphagnales</i>
On Trees	6 species	• <i>Fissidens nobilis Griff</i> • <i>Huaniella</i> • <i>Schistostegia</i> • <i>Grimmia pulvinata</i> • <i>Leucobryum gloum Hed</i> • <i>Uloa crispata</i>
On Flower Pots	1 species	• <i>Syntrichia papillosa</i>

From Table 2, it can be observed that the area with the highest bryophyte diversity is on the soil, with a total of 7 species: *Hymenosyllum recurvirostrum*, *Sphagnales*, *Fissidens nobilis Griff*, *Syntrichia ruralis*, *Mnium hornum*, and *Orthotrichum lyelli*. The second-highest diversity was found on trees, with 6 species: *Fissidens nobilis Griff*, *Huaniella*, *Schistostegia*, *Grimmia pulvinata*, *Leucobryum gloum Hed*, and *Uloa crispata*. On bricks, 3 species were found: *Syntrichia papillosa*, *Tortula obtusifolia*, and *Plagiommium cuspidatum*. The least diversity was found on rocks, with only 1 species, *Sphagnales*, and on plant pots, with 1 species, *Syntrichia papillosa*.

Research Methodology

1. Research Procedure

- 1) Set the research issue, select the topic to be studied
- 2) Research, collect knowledge and theories related to the research
- 3) Determine the purpose of the study
- 4) Select the point to study the bryophytes within Wichianmat School

2. Procedure

- 1) Plan the research operation
- 2) Collect bryophyte samples from various locations within the school
- 3) Find the species and classify the types of bryophytes

Bryophyte Sampling Survey and Sampling: Conduct a survey and collect bryophyte samples within Wichianmatu School, Mueang District, Trang Province, on three separate occasions. Ensure sampling covers all microhabitats, such as on soil, rocks, bricks, trees, and various areas within the school, including both well-lit and shaded locations. Record the characteristics of the habitats where they are found and the growth patterns of each bryophyte species.

Conclusion and Discussion of Research

The study of bryophyte diversity in Wichienmatu School, Kokklo Subdistrict, Mueang District, Trang Province, revealed that the factors affecting bryophyte diversity include humidity and temperature, which influence the growth of bryophytes. It was found that areas with higher humidity and lower temperature tended to have higher bryophyte density, and areas with similar characteristics contained similar species of bryophytes. This study identified the factors that affect the growth and diversity of bryophytes. The findings from this study provide valuable knowledge that can be used to further develop and apply future research on bryophyte diversity.

Citation Style

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