**A Study on the Diversity of Bryophytes in Wichienmatu School, Mueang District,**

**Trang Province**

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**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

densityincreasing in such areas. This study identified factors that influence the growth and species diversity of bryophytes.

Keywords : Bryophyte diversity

**Acknowledgements**

This research on “A Study on the Diversity of Bryophytes in Wichienmatu School, Mueang District, Trang Province” has been successfully completed with the generous support and valuable guidance from many individuals. We would like to express our sincere gratitude to Mr. Sakda Paisomboon, the Director of Wichienmatu School, for facilitating our research work at various locations, providing insightful advice, and offering suggestions for improvements and corrections with great dedication.

The value of this research is dedicated to all those who have supported us, as well as to the authors of the books and documents referenced in this study. The research team would like to express our deepest gratitude and heartfelt appreciation to all of them.

### **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** **Objectives**

To study the diversity of bryophytes in Wichienmatu School, Mueang District, Trang Province.

**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.

GLOBE Measurement Principles

Measurement Principles of Biosphere Land Cover

Determination of Study Points

Area within Wichianmatu School, Mueang District, Trang Province

**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 Wichianmatu 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:

1) Conduct a survey and collect bryophyte samples within Wichianmatu School, Mueang District, Trang Province, on three separateoccasions. 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.

2) Morphological Study the morphological characteristics of the collected bryophytes under a microscope (CU Smart Lens 40x) for identification to the family and genus levels of mosses. Check the moss for moisture. Find the correct scientific name for each bryophyte species.

**Analysis and Conclusion of Research**

1. Analyze and categorize the collected data in tabular form, including a table of identified species and a table measuring the moisture levels of bryophytes.

2. Summarize the experimental results.

**Research** **Findings**

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

|  |  |  |
| --- | --- | --- |
| **Study area** | **Geographical coordinates** | |
| **Latitube (N)** | **Longitude (E)** |
| Wichienmatu School, Trang Province | 7.50432 | 99.62936 |

**Table** **2** shows the number and types of bryophytes.

| **Study area** | **Number of Bryophyte Species** | **Bryophyte Species** |
| --- | --- | --- |
| On Bricks | 3specie | *• Syntrichia papillosa*  *• Tortola obtusifolia*  *• Plaiomnium cuspidatum* |
| On Soil | 7species | *• Sphagnum*  *• Hymenosylium recurvirostrum*  *• Sphagnales*  *• Fissidens nobilis Griff*  *• Syntrichia ruralis*  *• Mnium hornum*  *• Orthotrichum lyellii* |
| On Rocks | 1species | *• Sphagnales* |
| On Trees | 6species | *• Fissidens nobilis Griff*  *• Husnotiella*  *• Schistostega*  *• Grimmia pulvinata*  *• Leucobrynm glaum Hed* *• Ulota crispa* |
| On Flower Pots | 1species | *• Syntrichia papillosa* |

From Table 2, it can be observed that the area with the highest bryophyte diversity on the soil with a total of 7 species: Hymenosylium, Recurvirostrum, Sphagnales, Fissiden nobilis Griff, Syntrichia ruralis, Mniumhornum, and Orthotrichum lyellii. The second-highest diversity was found on trees, with 6 species: Fissidens nobilis Griff, Husnotiella, Schistostega, Grimmia pulvinata, Leucobryum glauum Hed, and Ulota crispa. On bricks, 3 species were found: Syntrichia papillosa, Tortula obtusifolia, and Plagiomnium cuspidatum. The least diversity was found on rocks, with only 1 species, Sphagnales, and on plant pots, with 1 species, Syntrichia papillosa.

**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**, observeds the area with the highest temperature 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** **5** shows the species and image examples of bryophytes.

| **Bryophyte secies** | **Bryophyte specimens** |
| --- | --- |
| *Mnium hornum* |  |
| *Fissidens nobilis* griff |  |
| *Syntrichia papillosa* |  |
| *Tortola obtusifolia* |  |
| *Sphagnum* sp. |  |
| *Hymenosylium recurvirostru* |  |
| *Husnotiella* sp. |  |
| *Schistostega* sp*.* |  |
| *Grimmia pulvinat* |  |
| *Leucobryum glaucum* Hed |  |
| *Plaiomnium cuspidatum* |  |
| *Syntrichia ruralis* |  |
| *Orthotrichum lyellii* |  |
| *Ulota crispa* |  |

From Table 5, the bryophyte species and images taken with a 40x magnification smart lens.

**Discussion** **of** **Research** **Findings**

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 to pecies 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.

**Research Summary**

1. Bryophyte Diversity in Wichienmatu School

From the study of bryophytes in Wichienmatu School, Mueang District, Trang Province, it was found that the area with the highest bryophyte coverage is on the soil, with 7 species identified: *Hymenosylium*, *Recurvirostrum*, *Sphagnales sp.*, *Fissidens* *nobilis* *Griff*, *Syntrichia* *ruralis*, *Mniumhornum* sp*.*, and *Orthotrichum* *lyellii*. This is because the soil and tree areas have the highest humidity and ample sunlight, creating favorable conditions for greater bryophyte diversity. The second-highest diversity was found on trees, with 6 species: *Fissidens* *nobilis* *Griff*, *Husnotiella sp.*, *Schistostega* sp*.*, *Grimmia* *pulvinata*, *Leucobryum* *glauum* *Hed*, and *Ulota* *crispa*. On bricks, 3 species were found: *Syntrichia* *papillosa*, *Tortula* *obtusifolia*, and *Plagiomnium* *cuspidatum*. This is due to the lower humidity and limited sunlight exposure on the bricks, which results in lower bryophyte diversity in that area. The least number of bryophyte species was found on the rocks, with only 1 species, *Sphagnales* sp*.* Similarly, on plant pots, 1 species, *Syntrichia* *papillosa*, was found. This is due to the very low humidity and the lack of sunlight exposure on the plant pots, resulting in very low bryophyte diversity.

2. Humidity in the Areas Where Bryophytes Were Found

From the study of humidity in different areas, it was found that the soil had the highest moisture content, while the rocks had the lowest. This is because bryophytes require sufficient moisture, and choosing the right location for planting is essential. Proper care involves maintaining consistent moisture for the bryophytes, which is ideal for their growth.

3. Temperature in the Areas Where Bryophytes Were Found

From the study of temperature in different areas, it was found that the soil had the lowest temperature, while the plant pots and rocks had the highest temperatures. This is because

bryophytes should be kept in temperatures that are not too high. Proper care involves in ensuring that bryophytes are maintained at a moderate or slightly cooler temperature, which is ideal for their growth.

**Citation** **Style**

Senyai et al. (2017). Diversity of Bryophytes. [Online]. Retrieved from https://ph01.tcithaijo.org/index.php/KKUSciJ/article/download/250199/169673/899558

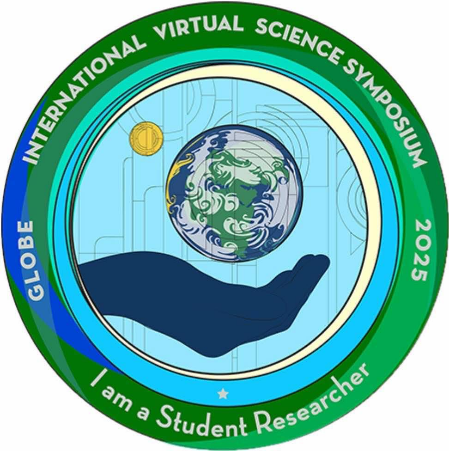
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**OPTIONAL BADGES**

**I AM A STUDENT RESEARCHER**

Our group chose this logo because our research studies the diversity of bryophytes within Wichienmatu School, Mueang District, Trang Province. We began by asking questions about the environmental factors that affect bryophyte diversity. Then, we planned to measure soil moisture and soil temperature, and determined the locations and areas to study within the school, such as on the ground, on trees, and on bricks, to examine bryophyte diversity. We also analyzed the research results logically and accurately to summarize our findings. This research not only enhances knowledge about bryophyte diversity but can also serve as a guide for those interested in conducting effective studies.

**I AM COLLABRATOR**

Our research on bryophyte diversity at Wichienmatu School, Khok Lo Subdistrict, Mueang Trang District, Trang Province requires the collaboration of team members to survey bryophytes. Responsibilities include collecting data on bryophytes at each location and measuring soil moisture and soil temperature within the school grounds. We work systematically, consulting and exchanging knowledge with each other to achieve the best possible results in studying bryophyte diversity and the factors affecting bryophyte growth.

**Appendix**

