

**IDENTIFICATION OF MOSS PLANTS AROUND NAMORAMBE DISTRICT****¹Cindy Silvia, Dinda ^{2*}Riris Wulandari, ³Ahmad Fachrizal, ⁴Syarifah Widya Ulfa**¹²³⁴Department of Tadris Biology, North Sumatra State Islamic University

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Accepted: April 17th, 2024. Published: July 31th, 2024**Abstract**

Non-vascular plants, such as mosses (Bryophyta), are commonly found on land. The class of plants known as tuberous plants, or plants that do not have true roots, stems, or leaves as well as xylem and phloem vessels, includes moss plants. Knowing the diversity of moss plants in Namorambe Sub-district is the purpose of this research. On May 9, 2024, this research was conducted by walking around the Namorambe area to look for moss plants that might be there. This research methodology is qualitative, using descriptive and exploratory techniques. This research used observation, documentation, and literature study as data collection methods. Direct investigation into the Namorambe area was used to make observations to identify moss plants. The three species identified based on the results of the identification of leaf mosses around Namorambe Sub-district were *Hyophila* sp., *Pogonatum cirrhatum*, and *Barbula indica*. Leaf mosses were made near people's work areas and were made on tree bark and stone substrates.

Keywords: Bryophyta, Type, Classification, Habitats

Introduction

The Greek terms bryon, meaning moss, and phyton, meaning plant, are the origin of the term bryophyta, or moss plants. A class of plants known as tuberous plants, or plants without true roots, stems, or leaves as well as xylem and phloem vessels, includes mosses. The gametophyte and sporophyte stages are the change of offspring (metagenesis) that moss plants go through in their life cycle. Moss plants live in moist environments, such as on rock surfaces or as epiphytic plants attached to tree trunks. One type of non-vascular flora that grows widely on land is moss (Bryophyta). According to ecologists, they play an important role in an ecosystem's ability to maintain clean air, water, and habitat for other living things. They also serve as bioindicators of environmental transformation and are considered pioneer flora. (Rahman, sari rahayu.2018)

The word "bryophyta" comes from the Greek words "phyto" (plant) and "bryon" (moss). It is impossible to differentiate between the roots, stems, and leaves of moss plants. Because they do not have xylem and phloem vessels as well as true roots, stems and leaves, moss plants are categorized as thallus plants. Lower plants called mosses belong to the group of epiphytic plants which are often found on tree trunks, rocks, soil and old wood. Moisture and freezing temperatures are preferred by moss plants. In general, plants in the bryophyta division are more developed than those in the Thallophyta division. Because cells in the Bryophyta division contain chlorophyll a and b, this division is entirely green.

The majority of plants that live on land in the Bryophyta division have cell walls made of cellulose. Antheridium (male genitalia) and archegonium (female genitalia) are the genitalia of the Bryophyta division, and consist of many cells other than the sporangium. The shape and arrangement of the gametangium is comparable to plants belonging to the Bryophyta division, especially in archegonium, which has the same characteristics as plants in the Pteridophyta division. As a result, Pteridophyta and Bryophyta were divided into the tribe

Archegoniata. Spores are used in the reproductive division of Bryophyta, or moss plants, but vegetative methods are also an option. When the body has not shown further separation, the moss still has thallus, which resembles a creeping sheet. However, it has been found that the bodies of mosses have a structure very similar to that of higher plants. The type of air cavity seen in certain moss plants facilitates gas exchange, performing a similar role to the stoma in higher plants. Even though mosses have shown further body divisions, they are still categorized as thallus plants and not cormus plants. (Nada Nabila Ivhone. 2018).

Characteristics of Bryophyta Moss Plants

Currently, liverworts, hornworts, and leaf mosses are three types of small, non-woody (herbaceous) plants that are classified as mosses. Primitive plants are plants that include mosses. Moss plants appear smaller than other types of plants, based on their size. Moss plants only measure 10-20 cm long and 1-2 cm wide. Moss plants larger than that are very rarely found. One of the characteristics of moss plants is their ability to absorb dissolved substances and water throughout their bodies. The body shape of moss plants is a transition from the thallus shape to the cormus shape. In addition, mosses do not have phloem and phloem tissue as well as flowers and seeds. (Rifaldi Azwad. 2020)

The only structure in this plant is a structure that looks like roots and functions as a location for taking and transferring nutrients and water for plant survival. This plant is different from other plants in general. Plants that do not have true leaves and do not have the ability to differentiate between roots and stems are known as mosses. Moss plants develop into plants that contribute to biodiversity and are one of the flora that require care to continue to exist. The following characteristics are characteristic of moss plants:

1. Cellulose-based cells that make up his body
2. Has a layer of cells called the cortex which forms the deepest layer of the skin.
3. Contains a nuclear cylinder made of parenchyma cells, which is used as a food

source and to transport mineral salts and water.

4. The rhizoid shape of moss plants resembles threads and is important for attaching tools to the growth site and for absorbing water and mineral salts. In moss plants, rhizoids have the same function as roots.

5. The sporophyte, also known as the sporogonium, is composed of the following structural elements: the vaginule, the foot part surrounded by the vestigial wall of the archegonium; seta, upper part of the stalk; apophysis, part of the tip of the seta that is slightly widened and functions as a tool to convert the seta into a spore box; calyptra, also known as tudung; and columella.

Classification of bryophyte mosses

There is great species diversity among mosses. After flowering plants, the moss plant group is the largest in the plant kingdom. There are between 15,000 and 25,000 different types of moss in the world, according to Glime (2006). Three divisions make up the Bryoflora: Marchantiophyta (liverworts), Anthocerotophyta (hornworts), and Bryophyta (leafworts). With more than 12,800 species, mosses are the largest and most varied group. Lichens have a wide variety of environments, including soil, sand, rocks, tree trunks, litter, and water, in addition to their extraordinary diversity. The three main environmental elements that influence moss growth are temperature, light intensity, and humidity. The degree of adaptation, species composition, and distribution of moss plants will all be influenced by variations in the tolerance of each moss species to environmental conditions. (Marheny Lukitasari, 2018)

1. Hepaticae (Liverworts)

Liverworts are shaped like sheets, as their name suggests (taus). There are 6,500 different species of liverworts. The body of the liverwort is separated into two lobes, each of which resembles a lobe of the human liver. Liverworts are usually found in damp or damp environments. The liverwort class is divided into various groups, such as Marchantiales and Jungermaniales. Two tribes, the Marchantiaceae and the Ricciaceae, comprise the Marchantiales. *Marchantia polymorpha*, *Marchantia*

geminata, *Marchantia polaceae*, *Marchantia emarginata*, *Marchantia paleaceae*, and *Reboulia hemisphaerica* are some of the species belonging to the Marchantiaceae family. Furthermore, a number of species belonging to the Ricciaceae family were identified, such as *Riccia fluitans*, *R. nutans*, and *R. trichocarpa*.

Jungermaniales is the second nation in the liverwort class. The tribes that make up this country are the Haplomitriaceae, Acrogynaceae, and Anacrogynaceae. The family Anacrogynaceae is subdivided into *Pellia epiphylla*, *Blasia pusilla*, *Metzgeria furcata*, and *Metzgeria conjugata*, among other species. In addition, the Acrogynaceae family is divided into several species, such as *Frullania tamarisci* and *Plagiochila asplenoides*.

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The shape of the gametophyte, the internal architecture of the seta, the decoration on the sporangial jacket, the ornamentation on the spores, and the structure of the elaters can all be used to identify liverworts. The tool used by Hepaticae is a spore producer. This spore-producing tool is protected by an elater structure and has setae as a support. Hepaticae are known for their distinct reproductive organs, which are often located on the surface and protected by an encompassing skeleton and unicellular rhizoids.

2. Anthocerotales (Horn Moss)

Hornworts are clearly classified according to their body shape. The presence of the sporophyte, which resembles a horn, and the thallus, which is a sexual organ, determines the anatomy of hornworts. The most important characteristics that can be seen for classification when making

observations are those related to the structure of the thallus, especially the internal architecture and cell contents. Compared to other mosses, the Anthocerotales order has fewer moss species. There are about 100 species in this group. There is only one order or nation of hornworts, namely the order Anthocerothyceae, which has several genera. Hornwort plant habitats include ditches, riverbanks, and lakeshores. The body structure of this moss is similar to liverworts, only the sporophyte is different. The hornwort sporophyte is an elongated capsule that eventually expands into a horn shape. *Anthoceros leavis*, *A. Fusiformis*, *Notothylas valvata*, *Anthoceros tjobodensis*, *Notothylas javanicus*, *dendroceros acutilobus*, *difficilis*, *cavernosus* Hasegawa, *dendroceros javanicus*, *Anthoceros punctatus*, and *Phaeoceros leavis* are several members of the anthocerotales family.

3. Musci (Leaf Moss)

On Earth, there is great diversity among leaf mosses. Species of moss number about 12,000 and are distributed over a wide area. Despite the fact that this moss can grow on sandy beds, leaf moss can thrive in areas that are dry or experiencing periods of drought. Humidity causes plants to create layers, while dry conditions cause them to form cushions. Additionally, this moss can cover hundreds of square feet of peat. 54 The genital organs of leaf mosses are grouped together on the branches, surrounded by the leaves above them. As a result, this moss genitalia is called a sissy or monoecious.

Research Method

This research is an example of qualitative research, and was conducted using descriptive and exploratory methodology. The Namorambe area was investigated in May 2024 for moss plants that may already be present there.

This research uses literature review, documentation, and observation as data collection methods. The process of identifying moss plants involves direct exploration of the Namorambe region. The observation process involves looking at all

substrates — such as rocks, tree bark, and soil as well as locations considered to have high relative humidity, which is the natural environment for moss plants.

Documentation is used to document moss plants that exist beside the highway in the Namorambe area. The researcher's actions in collecting data for this research were:

1. Set up each device to be used.
2. Assess each device that will be used.
3. Conduct observations throughout the Namorambe area.
4. Write down observations and document the particular plant moss observed.
5. Collect all information and documentation from completed observations.

Then at the data analysis stage, this research was carried out descriptively and presented in the form of tables and photos.

Result and Discussion

Deli Serdang Regency in North Sumatra includes Namorambe sub-district. 36 villages form Namorambe: Batu Fat, Batu Mbelin, Batu Penjemuran, Batu Rejo, Bekukul, Cinta Rakyat, Gunung Berita, Gunung Kelawas, Jaba, Jati Kesuma, Kuta Tualah, Kwala Simeme, Lubang Ido, Namo Batang, Namo Lambur, Namo Mbaru, Namo Mbelin, Namo Pinang, Rimo Mungkur, Rumah Kebeh, Rumah Mbacang, Salang Tungkir, Sudirejo, Suka Mulia Hilir, Suka Mulia Hulu, Tanjung Selamat, Ujung Labuhan, Uruk Gedang, Deli Tua, Kuta Tengah, Lau Mulgab, Tangkahan, Timbang Opponent, Namorambe Silue Lue.

In Namorambe District, leaf mosses of various types can be found on rocks, tree bark and around residential areas. Based on findings from the identification of moss plants in the Namorambe district, scientists discovered three species of leaf moss: *Hyophila* sp., *Pogonatum cirrhatum*, and *Barbula indica*.

1. Leaf Moss (*Hyophila* sp)



Figure 1. Leaf Moss (*Hyophila* sp)

Table 1. Observation Results of Leaf Moss (*Hyophila* sp)

Klasifikasi	Warna	Bentuk	Jumlah
Kingdom : Plantae	It has a dark green color	The shape of the sheet is arranged in a spiral, the tips of the leaves are pointed and curved.	We found 1 type of <i>Hyophila</i> sp moss on the tree bark substrate.
Divisi : Bryophyta	and there are light green,		
Kelas : Bryopsida	yellowish green,		
Ordo : Pottiales	and brownish ones.		
Famili : Pottiaceae			
Genus : <i>Hyophila</i>			
Spesies : <i>Hyophila</i> sp			

This type of moss grows upright on rocks and moist soil in partially exposed environments. It rarely branches and can live in groups, thin patches, or stand alone with various types of moss. When the leaves dry, they wrinkle.

The leaves grow near reddish stems, which are decorated with alternating rows of leaves with a dense accumulation at the top. Large ribs that are upright and tapered from the base to the tip of the leaf, with flat leaf edges.

Habitat *Hyophila* sp. grassy, damp, and sometimes loose. Green at the top, dark red to reddish brown or dark green at the base are the stem colors. The stems can grow up to 1 cm high and sometimes branch (Endang, 2020). We observed *Hyophila* sp on rock substrates based on these findings.

2. Leaf Moss (*Pogonatum cirrhatum*)



Figure 2. Leaf Moss (*Pogonatum cirrhatum*)

Table 2. Observation Results of Leaf Moss (*Pogonatum cirrhatum*)

Klasifikasi	Warna	Bentuk	Jumlah
Kingdom : Plantae	It has a light green color, some are dark green,	The shape of the leaves is like a sheet arranged in a spiral.	We found 4 species of moss
Divisi : Bryophyta	green, yellowish green and brownish green.		<i>Pogonatum cirrhatum</i> and one of them we found on a rock substrate.
Kelas : Musci			
Ordo : Bryales			
Famili : Pogonataceae			
Genus : <i>Pogonatum</i>			
Spesies : <i>Pogonatum cirrhatum</i>			

Pogonatum cirrhatum is an upright growing moss plant with stems, single-layered leaves, and usually a vein in the center leaf where the branchial septa and rhizoids meet. Its leaves covered with a basal sheath gradually merge with the simple stem.

Sporangium, also known as seta, has an elastic stem. Pogonatumcirrhatum denotes a particular type of moss with a distinct innermost spore capsule. The top of the spore capsule has capsule walls arranged like a hat, or operculum.

For this type of moss, reproduction usually occurs through the sporophyte and gametophyte phases. Meanwhile, the gametophyte phase is the erect phase. Antheridium and Arsenium are found in the gametophyte between leaves. In contrast, the sporophyte phase differs significantly from the gametophyte phase. Apart from being known as a sporangium, the sporophyte lives as a parasite within the gametophyte, where its decline is associated with the occurrence of re-reduction, or spore-mediated recombination. This moss is a type of moss that inhabits lowland areas and usually feeds on rocks, trees, and sometimes even rocky areas. Pogonatum cirrhatum is a type of moss that is used in everyday life because it can be used as a substitute for cotton.

These plants grow quickly, colonize new areas, and disappear just as quickly. Its growth cycle is short, and it is a perennial species that survives by residence. Rhizoites function as an adhesive tool for this moss to stick to the substrate. Tree trunks and moist soil can function as substrates (Husain, 2022). And in the rock substrate of our investigation, we found this type of lichen.

3. Leaf Moss (Barbula indica)



Figure 3 Leaf Moss (*Barbula indica*)

Table 3. Observation Results of Leaf Moss (*Barbula indica*)

Klasifikasi	Warna	Bentuk	Jumlah
Kingdom : Plantae	This species has dark green	This species has leaves arranged in a	We found 1 type of barbula
Divisi : Bryophyta	leaves, a sporophyte	dense, alternating	indica moss found on
Kelas : Bryopsida	phase where the setae are brownish	arrangement so that they look stacked.	tree bark substrate.
Ordo : Pottiales	and the capsule at the tip is		
Famili : Pottiaceae	dark green.		
Genus : Barbula			
Spesies : Barbula Indica			

The moss *Barbula indica* is a member of the Pottiaceae family. This moss is relatively small, just over 1 centimeter high. The leaves are small with rounded edges, and the stems may be simple or branched. This moss has green or yellowish leaves that turn brown when dry. Live specimens of *Barbula indica* were observed attached to rock edges, concrete steps, and damp, chalky areas.

Barbula indica has a round capsule 1.5 mm long, cylindrical, with short setae. The cap of the capsule is slender cone-shaped. It has smooth brownish rhizomes and grows on rocks, especially in damp, chalky environments. The stems are dark brown to reddish brown, erect, and sporadically branched. On the stem, lanceolate leaves grow vertically. The leaves will turn brown once dry. The leaves are arranged in an alternating pattern. dense enough to appear stacked on top of each other. has small toothed leaf edges. The

large costa ends at the tip of the leaf, which has a rounded tip. Occasionally, the upright set is bent at least 1 cm. Can find this type of moss growing in groups. compact and grows in an upright position in open environments with calcareous soil.

Conclusion

In the Namorambe sub-district, various leaf mosses are found, leaf mosses are found around residential areas, tree bark substrates and also rocks. Based on the results of identifying moss plants in Namorambe sub-district, researchers found leaf moss with 3 species, namely *Hyophila* sp, *Pogonatum cirrhatum* and *Barbula indica*

Hyophila sp has a humid habitat where grass sometimes grows loose. Green at the top, dark red to reddish brown or dark green at the base are the stem colors. The stems can grow up to 1 cm tall and can sometimes branch. Based on these observations, we found *Hyophila* sp. on tree bark substrates. *Pogonatum cirrhatum* is an upright growing moss plant with stems, single-layered leaves, and usually a vein in the center leaf where the branchial septa and rhizoids meet. Its leaves covered with a basal sheath gradually merge with the simple stem. The moss *Barbula indica* is a member of the Pottiaceae family. This moss is relatively small, just over 1 centimeter high. The leaves are small with rounded edges, and the stems may be simple or branched. This moss has green or yellowish leaves that turn brown when dry. Live specimens of *Barbula indica* were observed attached to rock edges, concrete steps, and damp, chalky areas.

The benefits of moss plants are numerous. Animals benefit from moss plants, and humans can benefit from other plants as well, such as medicinal plants. Apart from that, what is important for ecology or ecosystems is moss plants. In addition to their beneficial effects on soil formation, preventing erosion, and weathering forest litter, moss plants also contribute to the maintenance of forest ecosystems. In addition, moss plants contribute to increasing the capacity of forests to hold

water. Bioindicator of environmental contamination is moss.

When formulating the results section, it's important to remember that the results of a study do not prove anything. Research results can only confirm or reject the research problem underpinning your study. However, the act of articulating the results helps you to understand the problem from within, to break it into pieces, and to view the research problem from various perspectives.

Reference

- Azward, rifaldi, Dkk.(2020).JENIS-JENIS LUMUT(*BRYOPHYTA*) DIHUTAN SEKUNDER DESA SEPANDAN KECMATAN BATANG LUPAR KABUPATEN KAPUAS HULU. *Jurnal hutan lestari*.(vol.8,No. 2, 230-238)
- Endang,T., Jumiati., Dyah, P. (2020). Inventarisasi Jenis-Jenis Lumut (Bryophyta) di Daerah Aliran Sungai Kabura-Burana Kecamatan Batauga Kabupaten Buton Selatan.
- Husain, Z., Pikoli, S. W., Salam, N., Uno, W. D., Kumaji, S. S., & Febrianti, F. (2022, December). VARIASI MORFOLOGI LUMUT (BRYOPHYTA) DI AREA KAMPUS BONE BOLANGO UNIVERSITAS NEGERI GORONTALO. In Prosiding Seminar Nasional Mini Riset Mahasiswa (Vol. 1, No. 2, pp. 72-80).
- Lukita,sari.(2018). *Mengenal tumbuhan lumut(bryophyte) deskripsi, klasifikasi, potensi dan cara mempelajarinya*.Ae media grafika. Jawa timur.
- Nabila, nada Ivhone, Dkk.(2020). JENIS-JENIS TUMBUHAN LUMUT (*BRYOPHYTA*) PADA BERBAGAI

SUBSTRAT DIDESA PASAR
MELINTANG KOTA
BENGKULU. *Prosiding seminar
nasional biotik.*

- Rahman, Sari Rahayu.2018.Identifikasi Tumbuhan Lumut Di Kabupaten Majene. Prosiding Seminar Nasional Simbiosis III ,Madiun.
- Ulfa, syarifah widya.2023.identifikasi tumbuhan lumut di beberapa kecamatan Di Kota Medan. INNOVATIVE: Journal Of Social Science Research. 3(3).
- Wiadril, Ardila Putri. 2018.Identifikasi Tumbuhan Lumut(Bryophyta) di sekitar air terjun sigerincing Dusun Tuo, Kecamatan Lembah Masurai, Kabupaten Merangin.BIOCOLONY: Journal pendidikan biologi dan biosains. 1(2).