Diversity of types pterodhopita in the campus Universitas Sumatera Utara

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Abstract. Forests in Indonesia that have high biodiversity, including one of them is the type of fern. The characteristic of Indonesian tropical rainforests is that they have high rainfall so that they strongly support the existence of this type of fern. In general, ferns like humid habitat conditions. The purpose of this study was to determine the types of ferns around the campus Sumatera Utara. The method of this research is by roaming, namely exploring each location that can represent the location where there is the most vegetation. The number of types of ferns found on the campus of the Universitas Sumatera Utara is 20 types. There are 9 families in the research location, including the polypodiaceae family as much as 35%, Pteridaceae (20%), Thelypteridaceae (15%), Nephrolepidaceae (10%), Aspleniaceae (10%), Athyriaceae (5%), Dryopteridaceae (5%) and Blechnaceae (5%). There are 13 types that grow epiphytic and 7 that live terrestrially. The host trees for epiphytic ferns include Swietenia mahagoni, Elaeis guineensis, Gmelina arborea, Samanea saman and Paraserianthes falcatoria.

1. Introduction
The diversity of types of epiphytic ferns in various types of host trees due to their dependence on the micro-climatic conditions of the forest stands, causing the existence of a number of epiphytic fern colonies to be found only in certain tree species or in certain tree parts [1]. Ferns are one of the undergrowth vegetation that are often found in forest ecosystems. Ferns can be used as food and ornamental plants [2]. Ferns and lycophytes are spread globally with a total of 11,000 species [3]. The fern (Pteridophyta) is a division whose citizens clearly have corms, which means that their bodies can be distinguished into three main parts, namely roots, stems and leaves [4].

The Universitas Sumatera Utara campus is included in the green campus with an area of 120 hectares which has green open space with various types of trees that are maintained. Old trees such as Swietenia mahagoni and Tamarindus indica have a diameter of up to 1 meter. Humid shade conditions in several forest locations on the Campus Universitas Sumatera Utara grow ferns, both that grow efficiently on old tree trees and grow terrestrial under stands. Some locations that are overgrown with ferns include Tri Dharma forest, Friendship forest, and Library Park. This study aims to (1) make an inventory of the diversity of ferns in the campus of the Universitas Sumatera Utara (2) to identify the types of host plants that are overgrown by ferns.
2. Materials and methods
The method of collecting ferns is done by roaming, namely exploring each location that can represent the location with the most vegetation. Several locations were chosen deliberately, namely Tri Dharma Forest, Friendship Park, Library Park. These locations are areas with a lot of vegetation and overgrown with many types of ferns.

3. Results and discussion
The results showed that there were 20 types of ferns from 9 families in the Campus of the University of North Sumatra. The number of epiphytic ferns was 13 species that grew on various types of trees and 7 species grew terrestrial under stands. Compared to research by [5] in the forest area of Beginjan Village, Tayan Hilir District, Sanggau Regency, there are 14 types of ferns. The ferns in University of North Sumatra environment were terrestrial and epiphytic.

Types of host plants found are oil palm (*Elaeis guineensis*), mahoni (*Swietenia mahagoni*), jati putih (*Gmelina arborea*), asam jawa (*Tamarindus indica*), trembesi (*Samanea saman*), and sengon (*Paraserianthes falcataria*).

**Table 1a.** The type of fern found in the campus of the Universitas Sumatera Utara

| No. | Scientific name                  | Families       | Life location / host                                                                 |
|-----|---------------------------------|----------------|-------------------------------------------------------------------------------------|
| 1   | *Adiantum latifolium*           | Pteridaceae    | Below stands                                                                        |
| 2   | *Asplenium nidus*               | Aspleniaceae   | *Elaeis guineensis*, *Swietenia mahagoni*, *Paraserianthes falcataria Samanea saman*, *Gmelina arborea*, *Tamarindus indica* |
| 3   | *Christella subpubescens*       | Thelypteridaceae | Under trees                                                                         |
| 4   | *Christella dentate*            | Thelypteridaceae | Open field                                                                           |
| 5   | *Cyclorosus heterocarpus*       | Thelypteridaceae | Under trees                                                                         |
| 6   | *Davalia denticulata*           | Polypodiaceae  | *Elaeis guineensis*, *Swietenia mahagoni*, *Paraserianthes falcataria Samanea saman*, *Gmelina arborea* |
| 7   | *Diplazium esculentum*          | Athyriaceae    | Under trees                                                                         |
| 8   | *Dynaria sparsisora*            | Polypodiaceae  | *Elaeis guineensis*, *Samanea saman*, *Swietenia mahagoni*                        |
| 9   | *Haplopteris angustifolia*      | Pteridaceae    | *Elaeis guineensis*, *Samanea saman*, *Swietenia mahagoni*                        |
| 10  | *Nephrolepis bisserata*         | Nephrolepidaceae| *Elaeis guineensis*, *Swietenia mahagoni*                                          |
| 11  | *Phymatosorus scolopendria*     | Polypodiaceae  | *Elaeis guineensis*, *Swietenia mahagoni*, *Paraserianthes falcataria Samanea saman*, *Gmelina arborea* |
| 12  | *Pityrogramma calomelanos*      | Pteridaceae    | Under trees                                                                         |
| 13  | *Pleocnemia irregularris*      | Dryopteridaceae| Under trees and open land                                                           |
| 14  | *Pyroscia longifolia*           | Polypodiaceae  | *Elaeis guineensis*, *Swietenia mahagoni*                                          |
| 15  | *Pyroscia lanceolata*           | Polypodiaceae  | *Elaeis guineensis*, *Swietenia mahagoni*                                          |
| 16  | *Pyroscia piloselloides*        | Polypodiaceae  | *Elaeis guineensis*, *Swietenia mahagoni*, *Paraserianthes falcataria Samanea saman*, *Gmelina arborea* |
| 17  | *Haplopteris angustifolia*      | Pteridaceae    | *Elaeis guineensis*, *swietenia mahagoni*                                          |
| 18  | *Microsorum punctatum*          | Polypodiaceae  | *Samanea saman*                                                                    |
| 19  | *Stenochlaena palustris*        | Blechnaceae    | *Elaeis guineensis*                                                                |
| 20  | *Nephrolepis exaltata*          | Nephrolepidaceae| *Elaeis guineensis*                                                                |

Note: L1: Tri Dharma forest, L2: Friendship forest, and L3: Library park
Table 1b. The type of fern found in the campus of the Universitas Sumatera Utara (Continue)

| No. | Scientific name            | Life pattern       | Utilization                          | L1 | L2 | L3 |
|-----|----------------------------|--------------------|--------------------------------------|----|----|----|
| 1   | Adiantum latifolium        | Terrestrial        | Ornamental plant                     | +  | +  | +  |
| 2   | Asplenium nidus            | epiphyte           | Ornamental plant                     | +  | +  | +  |
| 3   | Christella subpubescens    | Terrestrial        | not yet used, but potential as an ornamental plant | +  |     |    |
| 4   | Christella dentate         | Terrestrial        | not yet used, but potential as an ornamental plant | +  | +  |     |
| 5   | Cyclorosus heterocarpus    | terresterial       | not yet used, but potential as an ornamental plant | +  |     |    |
| 6   | Davalia denticulata        | epiphyte           | Ornamental plant                     | +  | +  | +  |
| 7   | Diplazium esculentum       | terrestrial        | Food                                 | +  |     |    |
| 8   | Dynaria sparsisora         | epiphyte           | Ornamental plant                     | +  | +  |     |
| 9   | Haplopteris angustifolia   | epiphyte           | not yet used, but potential as an ornamental plant | +  | +  | +  |
| 10  | Nephrolepis bisserata      | epiphyte           | Ornamental plant                     | +  |     |    |
| 11  | Phymatosorus scolopendria  | epiphyte           | Ornamental plant                     | +  | +  | +  |
| 12  | Pityrogramma calomelanos   | terrestrial        | Ornamental plant                     | +  |     |    |
| 13  | Pleocnemia irregularis     | terrestrial        | not yet used, but potential as an ornamental plant | +  |     |    |
| 14  | Pyrrosia longifolia        | epiphyte           | not yet used, but potential as an ornamental plant | +  | +  |     |
| 15  | Pyrrosia lanceolata        | epiphyte           | Medicinal                            | +  |     |    |
| 16  | Pyrrosia piloselloides     | epiphyte           | Medicinal                            | +  | +  | +  |
| 17  | Haplopteris angustifolia   | epiphyte           | not yet used, but potential as an ornamental plant | +  | +  |     |
| 18  | Microsorum punctatum       | epiphyte           | Ornamental plant                     | +  |     |    |
| 19  | Stenochlaena palustris     | epiphyte           | Food and medicinal                   | +  |     |    |
| 20  | Nephrolepis exaltata       | epiphyte           | Ornamental plant                     | +  |     |    |

Note: L1: Tri Dharma forest, L2: Friendship forest, and L3: Library park

From the graph, it is known that the largest number of species found in the polypodiaceae family is 35%, pteridaceae (20%), Thelypteridaceae (15%), Nephrolepidaceae (10%), Aspleniaceae (10%), Athyriaceae (5%), Dryopteridaceae (5%) and Blechnaceae (5%). The types of ferns are Adiantum latifoliu, Asplenium nidus, Christella subpubescens. Christella dentate, Cyclorosus heterocarpus, Davallia denticulate, Diplazium esculentum, Dynarian sparsisora, Haplopteris angustifolia, Nephrolepis bisserata, Phymatosorus scolopendria, Pityrogramma calomelanos, Pleocnemia irregularis, Pyrrosia longifosia lanceifolia, Pyrosopteria lance. Microsorum punctatum, Stenochlaena palustris, and Nephrolepis exaltata. The following is a picture of a fern epiphyte in the library park of the University of North Sumatra.

Adiantum latifolium. Long rhizome creeping; dark brown scales [6]. These spikes grow terrestrial under stands which have dense and moist litter. Has a brown stem, green leaf color and elliptical leaf
shape. Grow in clumps so that they look beautiful. This fern is an ornamental plant that can be planted in pots both indoors and outdoors.

![Ferns epiphyte in the library park of the Universitas Sumatera Utara.](image)

**Figure 1.** Ferns epiphyte in the library park of the Universitas Sumatera Utara.

*Asplenium nidus.* This fern has the local name of bird's nest fern. Has the characteristics of an upright rhizome and is usually large. It is said to be a nest of berung because the leaf arrangement is neatly rounded. Usually this plant is Efipit and is widely cultivated as an ornamental plant. This bird's nest fern is effective in various types of trees such as Swietenia mahagoni trees, cape trees and oil palm plants.

*Christella subpubescens.* This fern is a terrestrial species that grows in moist, shaded soil. Grows between the litter on the soil surface. The color of the leaves is green and the position of the leaves is alternating on the petiole.

*Christella dentata.* Christella dentata has dark fibrous roots. This fern has a true stem and lives terrestrial above the soil surface.

*Cyclorosus heterocarpus.* This fern is a terrestrial type. Has an upright rhizome brown. The leaf stalks are green to brownish color.

*Davallia denticulate.* belongs to the Davalliaceae family. The characteristics of these ferns are that they have a round, slender, creeping rhizome. The rhizome has dark brown scales. The green type is round and the surface is smooth. The leaves are dark green on the upper surface (adaxial) and light green on the lower surface (abaxial). The leaf surface is smooth, the texture of the leaves is like paper. The pinula is arranged alternately on the rachis. There are branch bones which are also shaped like black lines under the leaves. The arrangement of these leaf bones is pinnate [5]. Effective in various types of plants such as oil palm. This fern is used as an ornamental plant as well as a bouquet.

*Diplazium esculentum.* has fibrous roots, stems grow upright green, have a smooth surface with scales. Leaflets are round blunt with leaf bones that form an indentation. The tip of the leaflets has a sharp tip, the leaves are green. Sorus is found at the bottom of the leaves, used as a vegetable, can be used as a drug to reduce body heat, can also be used as a drug after childbirth [7].

*Dynarian sparsisora.* The rhizome is creeping, at the base of the rhizome there is a rhizome with a brown leaf shape. The petiole is clear and has alternate leaves. The shape of the alternating leaf arrangement makes this fern look beautiful. This fern is included in ornamental plants. This fern can be cultivated in pots.
Pleocnemia irregularis. This fern is included in the Dryiopteridaceae family. This fern grows terrestrial in damp areas in the shade. This fern has fibrous roots. This type of fern is one of the edible types of local vegetables that grow wild. The stems and young leaves are soft which taste is taken into vegetables.

Pyrrosia longifolia. This fern is an epiphytic growth. Has a creeping rhizome. This fern has the potential as an ornamental plant to be cultivated in pots.

Pyrrosia lanceolata. This fern grows epiphytes. Has dark brown fiber roots. Enter the Polipodiaceae family. This fern can be used as a headache medicine by attaching the leaves which are crushed and affixed to the head that hurts.

Pyrrosia piloselloides. This fern is an epiphytic growing on large trees with humid climatic conditions. Has a creeping rhizome, usually circling the tree trunk it is on. This fern with the local name dragon scales ferns. This fern functions as a medicinal plant for rheumatism, vaginal discharge, breast cancer and coughs.

Haplopteris angustifolia. This fern is an epiphyte in various types of trees such as Swietenia mahagoni, Elaeis guineensis and others. Has a simple and long shape of the ental.

Nephrolepis bisserata. This fern has a stolon rhizome. Ental pinatus with brownish white scales, dangling, leaves arranged alternately, jagged edges, pointed ends. Sorus is brown and round in shape. This fern has the potential as an ornamental plant [8].

Phymatosorus scolopendria. This fern belongs to the epiphytic fern. Has a creeping rhizome. Green leaf color and has a tapered leaf tip. The shape of the tapered leaf tips forms indagh leaves, so that many types of fern are also cultivated as ornamental plants in pots.

Pityrogramma calomelanos. This fern has a creeping rhizome. Short leaf stalks appear along the rhizome.

Haplopteris angustifolia. These spikes have a brown creeping rhizome, short petioles, green leaf color and have a single leaf. Is an effifit fern in oil palm

Microsorum punctatum. Rhizome creeping, tapered leaf tip. This type of fern has a wide leaf shape that is almost similar to a nest of nests. Grow epiphytic clumps on trees. This plant can also be used as a terrestrial ornamental plant in a pot.

Stenochlaena palustris. This fern can grow epiphytic or terrestrial. This fern is characterized by red young leaves. If the leaves are old, the color is green. Has a tough stem when it is old. This fern is a type of fern that can be eaten and used as medicine. This fern leaf can be used as a medicine for fever, skin diseases and others.

Nephrolepis exaltata. Has a stolon rhizome, alternating and tight leaf arrangement. Hard leaf stalk and brownish green. Green leaf color. The neatly arranged leaf shape makes this type of fern suitable as an ornamental plant. Growing effipit on oil palm plants.

4. Conclusions
There are 20 types of ferns found in the Universitas Sumatera Utara, including Adiantum latifolium, Asplenium nidus, Christella subpubescens, Christella dentate, Cyclorosus heterocarpus, Davallia denticulate, Diplazium esculentum, Dynarian sparsisora, Haplopteris angustifolia, Nephrolepis bisserata, Phymatosorus scolopendria, Pityrogramma calomelanos, Pleocnemia irregularis, Pyrrosia longifrosia lanceifolia, Pyrosopteria lance. Of all these types of ferns, there are 2 types of ferns that can be consumed, 2 types of medicines and 16 types including ferns that have the potential to be ornamental.

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