Identification and Inventory Pteridophyta in Mount Gede Pangrango National Park, Cibodas, West Java

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ABSTRACT
The fern is one of the plants that is easily found in Indonesia and it has a high diversity and distribution. Ferns are among the simplest vascular plants and are classified into sporous cormophytes which already have transport vessels. The purpose of this research was to identify and inventory the types of ferns found in Mount Gede Pangrango National Park. The research method used was descriptive with path tracking techniques and observations on the morphology of the found ferns. The research results obtained that 29 species of ferns were found in the observations made, namely Ophioglossum reticulatum L., Selaginella canda (Dsw.) Spring, Davallia denticulata (Burm.) Mett. & Kuhn, Adiantum capillus-veneris L., Asplenium adiantum-nigrum L., Dryopteris sparsa (Ham.) Kunze, Angiopteris evecta (G.Forst.) Hoffm., Dipteris conjuga Reinw., Pteridium heterocarpa Bedd., Phlegopteris connectilis (Michx.) Watt, Asplenium nidus L., Polyhythrum aculeatum Roth, Tectaria crenata Cav., Pityrogramma calomelanos (L) Link, Pteris bifurcata L., Nephradipsis biseriata (Sw.) Schott, Microsorum scolopendria (Burm.fil.) Copel., Gyathes contaminans (Wall. Ex Hook.) Copel., Davallia pentaphyla Blume, Dicksonia blumei (Kunze) T. Moore, Davallia trichomanoides Blume, Ctenitis vilis (Kunze) Ching, Thelypteris rudis (Kunze) Proctor, Adiantum hispidulum Sw., Bolitius quoyana (Gaud.) Ching, Selaginella ornata (Hook & Grev.) Spring, Drynaria plumhofoides Presl, Gleichenia linearis (Burm.) CBCL, and Psilotum nudum (L.) P. Beauv. This research concludes that each fern plant has its characteristics that can be used as a basis for observing and identifying the types of ferns and making an inventory.

INTRODUCTION
The fern is one of the oldest plants in the world because various fossils were found in rocks 420 million years old (Lestari, 2019; Nugroho et al., 2018). Ferns or Pteridophyta are easily found in Indonesia and are one of the flora groups that have a high diversity and wide distribution (Fatahillah et al., 2018; Wahyuningsih et al., 2018). This group of plants already has a true vascular system (cormus) but does not produce seeds for reproduction. Instead of seeds, this group of plants still uses spores as a means of generative propagation, just like mosses and fungi (Fatahillah et al., 2018; Nugroho et al., 2018; Nurza et al., 2019; Smith et al., 2006).

There are various forms of ferns, some are in the form of trees (ferns), usually unbranched, epiphytic, floating in the water, hydrophytic, but usually in the form of herbs with rhizomes that spread on the ground or hummus and ental (midrib) which support the leaves of the same size. varies (up to 6 m). The young leaves always curl (like a nail handle). Fern leaves are almost always compound leaves (Nugroho et al., 2018; Riastuti et al., 2018; Smith et al., 2006; Wahyuningsih et al., 2018).

Ferns (Pteridophyta) belong to simple vascular plants and are classified in Cormophyta spores which already have transport vessels. Nail plants (Pteridophyta) can live epiphytes, hygrophytes, hydrophytes, and live on other plant debris (Wahyuningsih et al., 2018; Wijana, 2014). Nail plants are a group of plants that have unique characteristics and are not found in other plant groups, with young leaves that are shaped like a loop of rope. Another characteristic is that all these plant types produce spores that are formed in the sporangium and are located on the lower surface of the leaf organ (Riastuti et al., 2018; Syafrudin et al., 2016; Wijana, 2014).

Indonesia has an abundant number of Pteridophyta because Indonesia has a climate that supports the growth of Pteridophyta. Pteridophyta is found in tropical forests that have abundant sunlight and high humidity (Fatahillah et al., 2018; Riastuti et al., 2018; Wahyuningsih et al., 2018). There are 450 species of ferns (Pteridophyta) found in West Java, 333 species in Central Java, and 319 species found in East Java (Lestari, 2019; Nugroho et al., 2018; Riastuti et al., 2018).

Mount Gede Pangrango National Park has an area of 22,851.03 hectares. This national park area by mountainous rain forest. Designated as a national park through Ministerial Decree No. 736/36 / Minister / X / 82 (Nugroho et al., 2018). The area of Mount Gede Pangrango National Park is an area of protection, scientific
studies, and sustainable use. The development of ferns in this area is managed by the West Java Conservation and Natural Resources Center, the Central Gunung Gede Pangrango National Park, LIPI, and PusLitBangHut for Nature Conservation (Fatahillah et al., 2018). This place is used as research because increased conservation of ferns needs to be done through identification and inventory to develop fern conservation management in Gunung Gede Pangrango National Park. Therefore, the research aimed to identify and inventory the species of ferns found in Mount Gede Pangrango National Park.

METHODS

The method used in this research is a descriptive method with path tracking techniques and observations on the morphology of the found ferns. The tools used in this research were cameras, datasheets, fern identification books, hand lenses, and stationery. Data collection was carried out by tracing the area of the hiking trail where ferns were expected to be found. Then, taking a few pictures of the specimen with a camera, trying to get the vegetative and generative organs used for identification. Next, make documentation, descriptions, and identify collection specimens using an identification key through a fern identification book for inventory.

RESULTS AND DISCUSSIONS

TABLE I. Ferns found in TNGGP, Cibodas, West Java

| No | Species | Classification |
|----|---------|----------------|
| 1. | *Ophioglossum reticulatum* L. | Class : Polypodiopsida  
Order : Ophioglossales  
Family : Ophioglossaceae  
Genus : *Ophioglossum*  
Species : *Ophioglossum reticulatum* L.  
([www.gbif.org](www.gbif.org)) |
| 2. | *Selaginella caudata* (Desv.) Spring | Class : Lycopodiopsida  
Order : Selaginellales  
Family : Selaginellaceae  
Genus : *Selaginella*  
Species : *Selaginella caudata* (Desv.) Spring  
([www.gbif.org](www.gbif.org)) |
| 3. | *Davallia denticulata* (Burm.) Mett. & Kuhn | Class : Polypodiopsida  
Order : Polypodiales  
Family : Davalliaceae  
Genus : *Davallia*  
Species : *Davallia denticulata* (Burm.) Mett. & Kuhn  
([www.gbif.org](www.gbif.org)) |
| 4. | *Adiantum capillus-veneris* L. | Class : Polypodiopsida  
Order : Polypodiales  
Family : Pteridaceae  
Genus : *Adiantum*  
Species : *Adiantum capillus-veneris* L.  
([www.gbif.org](www.gbif.org)) |
| 5. | *Asplenium adiantum-nigrum* L. | Class : Polypodiopsida  
Order : Polypodiales  
Family : Aspleniaceae  
Genus : *Asplenium*  
Species : *Asplenium adiantum-nigrum* L.  
([www.gbif.org](www.gbif.org)) |
| 6. | *Dryopteris sparsa* (Ham.) Kuntze | Class : Polypodiopsida  
Order : Polypodiales  
Family : Dryopteridaceae  
Genus : *Dryopteris*  
Species : *Dryopteris sparsa* (Ham.) Kuntze  
([www.gbif.org](www.gbif.org)) |
| 7. | *Angiopteris evecta* (G.Forst.) Hoffm. | Class : Polypodiopsida  
Order : Marattiaceae  
Family : Marattiaceae |
8. **Dipteris conjugata** Reinw.
   - **Genus**: Dipteris
   - **Species**: *Dipteris conjugata* (G.Forst.) Hoffm.
   - **Class**: Polypodiopsida
   - **Order**: Gheicheniales
   - **Family**: Dipteridaceae
   - **Genus**: Dipteris
   - **Species**: *Dipteris conjugata* (G.Forst.) Hoffm. (www.gbif.org)

9. **Pleopeltis heterocarpa** Bedd.
   - **Genus**: Pleopeltis
   - **Species**: *Pleopeltis heterocarpa* Bedd.
   - **Class**: Polypodiopsida
   - **Order**: Polypodiales
   - **Family**: Polypodiaceae
   - **Genus**: Pleopeltis
   - **Species**: *Pleopeltis heterocarpa* Bedd. (www.gbif.org)

10. **Phegopteris connectilis** (Michx.) Watt
    - **Genus**: Phegopteris
    - **Species**: *Phegopteris connectilis* (Michx.) Watt (www.gbif.org)
    - **Class**: Polypodiopsida
    - **Order**: Polypodiales
    - **Family**: Thelypteridaceae

11. **Asplenium nidus** L.
    - **Genus**: Asplenium
    - **Species**: *Asplenium nidus* L. (www.gbif.org)
    - **Class**: Polypodiopsida
    - **Order**: Polypodiales
    - **Family**: Aspleniaceae

12. **Polystichum acutatum** Roth
    - **Genus**: Polystichum
    - **Species**: *Polystichum acutatum* Roth (www.gbif.org)
    - **Class**: Polypodiopsida
    - **Order**: Polypodiales
    - **Family**: Dryopteridaceae

13. **Tectaria crenata** Cav.
    - **Genus**: Tectaria
    - **Species**: *Tectaria crenata* Cav. (www.gbif.org)
    - **Class**: Polypodiopsida
    - **Order**: Polypodiales
    - **Family**: Tectariaceae

14. **Pityrogramma calomelanos** (L.) Link
    - **Genus**: Pityrogramma
    - **Species**: *Pityrogramma calomelanos* (L.) Link (www.gbif.org)
    - **Class**: Polypodiopsida
    - **Order**: Polypodiales
    - **Family**: Pteridaceae

15. **Pteris bisaurita** L.
    - **Genus**: Pteris
    - **Species**: *Pteris bisaurita* L. (www.gbif.org)
    - **Class**: Polypodiopsida
    - **Order**: Polypodiales
    - **Family**: Pteridaceae

16. **Nephrolepis biserrata** (Sw.) Schott
    - **Genus**: Nephrolepis
    - **Species**: *Nephrolepis biserrata* (Sw.) Schott (www.gbif.org)
    - **Class**: Polypodiopsida
    - **Order**: Polypodiales
    - **Family**: Nephrolepidaceae

17. **Microsorum scolopendria** (Burm.fil.) Copel.
    - **Genus**: Microsorum
    - **Class**: Polypodiopsida
    - **Order**: Polypodiales
    - **Family**: Polypodiaceae
18. **Cyathea contaminans** (Wall. ex Hook.) Copel.

Species: *Microsorum scolopendria* (Burm.fil.) Copel.  
(www.gbif.org)

Class: Polypodiopsida  
Order: Cyatheales  
Family: Cyatheaceae  
Genus: Cyathea  
Species: *Cyathea contaminans* (Wall. ex Hook.) Copel.  
(www.gbif.org)

Class: Polypodiopsida  
Order: Cyatheales  
Family: Cyatheaceae  
Genus: Cyathea  
Species: *Cyathea contaminans* (Wall. ex Hook.) Copel.  
(www.gbif.org)

19. **Davallia pentaphyla** Blume

Class: Polypodiopsida  
Order: Polypodiales  
Family: Davalliaceae  
Genus: Davallia  
Species: *Davallia pentaphyla* Blume  
(www.gbif.org)

20. **Dicksonia blumei** (Kunze) T.Moore

Class: Polypodiopsida  
Order: Cyatheales  
Family: Dicksoniaceae  
Genus: Dicksonia  
Species: *Dicksonia blumei* (Kunze) T.Moore  
(www.gbif.org)

21. **Davallia trichomanoides** Blume

Class: Polypodiopsida  
Order: Polypodiales  
Family: Davalliaceae  
Genus: Davallia  
Species: *Davallia trichomanoides* Blume  
(www.gbif.org)

22. **Ctenitis vilis** (Kunze) Ching

Class: Polypodiopsida  
Order: Polypodiales  
Family: Dryopteridaceae  
Genus: Ctenitis  
Species: *Ctenitis vilis* (Kunze) Ching  
(www.gbif.org)

23. **Thelypteris rudis** (Kunze) Proctor

Class: Polypodiopsida  
Order: Polypodiales  
Family: Thelypteridaceae  
Genus: Thelypteris  
Species: *Thelypteris rudis* (Kunze) Proctor  
(www.gbif.org)

24. **Adiantum hispidulum** Sw.

Class: Polypodiopsida  
Order: Polypodiales  
Family: Pteridaceae  
Genus: Adiantum  
Species: *Adiantum hispidulum* Sw.  
(www.gbif.org)

25. **Bolbitis quoyana** (Gaud.) Ching

Class: Polypodiopsida  
Order: Polypodiales  
Family: Dryopteridaceae  
Genus: Bolbitis  
Species: *Bolbitis quoyana* (Gaud.) Ching  
(www.gbif.org)

26. **Selaginella ornata** (Hook & Grev.) Spring

Class: Lycopodiopsida  
Order: Selaginellales  
Family: Selaginellaceae  
Genus: Selaginella  
Species: *Selaginella ornata* (Hook & Grev.) Spring  
(www.gbif.org)

27. **Drynaria pleridioidea** Presl

Class: Polypodiopsida  
Order: Polypodiales  
Family: Polypodiaceae  
Genus: Drynaria
Species : *Drynaria pleuridioides* Presl
(www.gbif.org)

Class : Polypodiopsida
Order : Gleicheniales
Family : Gleicheniaceae
Genus : *Gleichenia*
Species : *Gleichenia linearis* (Burm.) C.B.Cl.
(www.gbif.org)

Class : Polypodiopsida
Order : Psilotales
Family : Psilotaceae
Genus : *Psilotum*
Species : *Psilotum nudum* (L.) P.Beauv.
(www.gbif.org)

**Ophioglossum reticulatum** L. this plant is found in the cliffs of the ground. This fern was observed to have a single frond and upright fertile, sorus sunk in 2 lines, green, tufted rhizome shape, obovate-shaped lamina, and hairless stipe can be seen on Figure 1a. *Selaginella caudata* (Desv.) this spring plant is found in cliffs of land. This fern was observed to have reclining stems and partially standing upright branching, stypes arranged opposite and hairless, lamina bipinnatus form, and rhizoma short creeping can be seen on Figure 1b.

**Davallia denticulata** (Burm.) Mett. & Kuhn this plant was found attached to the substrate in the form of holdfast Angiopteris evecta can be seen on Figure 2b. This fern was observed to have a long creeping and scaly rhizome, the shape of the lamina pinnatus pinnatifit, the frond stalk jointed to the rhizome, the sorus indusium and the round indusium (peltate), and the indusium attached to the base of the sorus (Salamah *et al.*, 2020; Astuti *et al.*, 2017).

**Adiantum capillus-veneris** L. this plant is found in the cliffs of the ground. This fern has a sorus on the surface of a small leaf that rolls inward from the edge of the lamina, an exindusiate sorus, a black and hairless stipe, a light green triangular leaf consisting of many fan-shaped leaves, around stem with a dichotomous branching black-brown black, grooved lamina edge, tapered leaf base, indented leaf tip, and smooth surface (Betty *et al.*, 2015; Purnawati *et al.*, 2014). Then, the lamina bipinnatus pinnatifid and rhizoma form short creeping can be seen on Figure 2a.
**Figure 3.** a) *Dryopteris sparsa* (Ham.) Kuntze, b) *Dipteris conjugata* Reinw., and c) *Pleopeltis heterocarpa* Bedd.

*Asplenium adiantum-nigrum* L. this plant is found in soil cliffs. This fern is observed to have no rhizome in the form of root fibers that are immersed in the soil or as a rock attachment if the epiphyte is in the rock can be seen on Figure 1c. Then, it has a rhizome root that is short and scaly, the short stype is not even visible, the lamina is sitting and has a very short stem and is reddish-green, a single lamina, pinnate leaf bones, not segmented with rhizome roots, tightly packed (Salamah *et al.*, 2020; Riastuti *et al.*, 2018). Then, the sorus builds a line or narrow elongated, located next to the leaf bone, oblique or almost upright with the mother branch of the leaf bone. This plant is used as a decoration that can be found on top of trees, in pots, and attached to rocks (Yusal and Toni, 2021; Astuti *et al.*, 2017).

**Figure 4.** a) *Angiopteris evecta* (G.Forst.) Hoffm., b) *Asplenium nidus* L., and c) *Polystichum aculatum* Roth

*Dryopteris sparsa* (Ham.) Kuntze this plant is found on the path to the waterfall. This plant has smaller ribs and rachis with grooves, the frond stalk has a fierce bundle at the base, sorus indicium, and is a terrestrial fern can be seen on Figure 3a. *Angiopteris evecta* (G. Forst.) Hoffm. This plant is found on the path to the waterfall. This plant has been observed to have fiber roots that branch like a dichotom, the types of leaves are pinnate compound, the overall leaf shape is elongated, tapered leaf tips, jagged leaf edges, green leaf color, rough surface, hairy stems, sorus is under the leaves, scattered or regular layout, and sorus brown can be seen on Figure 4a.

**Figure 5.** a) *Tectaria crenata* Cav., b) *Pityrogramma calomelanos* (L.) Link, and c) *Pteris biaurita* L.

*Dipteris conjugata* Reinw. This plant is found on the path to the waterfall. This fern has a similarly shaped, wedge-shaped frond, a long, spreading rhizome covered with stiff, black, hair-like hair can be seen on Figure 3b. Then, the stems are black with a smooth surface, the leaves are fan-shaped, thin and not stiff, the underside of the leaves has rough hair, the color of the leaves is light green and the edges of the leaves are jagged, and there is sorus under the leaf surface with an irregular location (Musriadi *et al.*, 2017; Nasution and Khardhinata, 2018).
pleopeltis heterocarpa Bedd. This plant is found on the path to the waterfall. This plant has a hairy rhizome which tends to be scaly, epipetric (grows on rocks), forms the pinnatifid lamina, sorus is along the edge, and is round in shape with a brown color can be seen on Figure 3c. *Phegopteris connectilis* (Michx.) Wattage this plant is found in cliffs of land. This plant has compound leaves with incised leaf edges and the upper surface of the leaves is bright green while the lower surface is pale green. Then, the upper surface of the leaves is smooth and the lower surface is thinly haired with rounded sorus leaves. Sorus has no indusium and the roots of this plant are fibrous and rhizome can be seen on Figure 2c.

*Asplenium nidus* L. This plant was found attached to tree trunks in the forest on the road leading to a waterfall. This plant has a short rhizome and is covered with smooth and dense scales, brown rhizome scales, single leaves arranged on a short circular stem to form a basket, the lower leaves are paler with brown stripes, the sorus is elongated and located under the leaves can be seen on Figure 4b.

*Polystichum acutatum* Roth this herb is found on the path to the waterfall. This plant has a lamina pinnate-pinnatifid form, a hairy stype, a sorus exindusiate form can be seen on Figure 4c. *Tectaria crenata* Cav. This plant is found on the path to the waterfall. This plant has a rib that appears grooved and slightly hairy, frond stalk with several veins at the base, lanceolate leaf shape, hairless stipe can be seen on Figure 5a. *Pityrogramma calomelanos* (L.)
This plant link is found on the path to the waterfall. The plant has a pinnate compound frond and the underside of the lamina is covered with waxy white or gold powder can be seen on Figure 5b.

![Figure 9](image)

Figure 9. a) Dicksonia blumei (Kunze) T.Moore, b) Ctenitis vilis (Kunze) Ching, and c) Adiantum hispidulum Sw.

Pteris biaurita L. This plant is found on the path to the waterfall. The frond is pinnate, sometimes triple-leafed (bi-tri-pinnatus), the sorus is protected by an indusium that opens towards the leaf bone, sorus is at the marginal or marginal edge, and sorus is continuous along most of the edges of the leaflets can be seen on Figure 5c.

![Figure 10](image)

Figure 10. a) Bolbitis quoyana (Gaud.) Ching, b) Selaginella ornata (Hook & Grev.) Spring, and c) Drynaria pleuridoides Presl

Nephrolepis biserrata (Sw.) Schott This plant is found epiphytes on tree trunks in the path that leads to the waterfall can be seen on Figure 6a. This plant has brown rhizome, decumbent rhizome, hairy and brown stipe, pinnule lancelot and 1-pinnate serate blade, green lamina, hairy lamina surface, lamina pinnule serate edge, acute pinnule apex, reticulate vein, kidney-shaped sorus (reinform), and the location of the marginal spores (Hasibuan et al., 2016; Yusal and Toni, 2021; Salamah et al., 2020).

![Figure 11](image)

Figure 11. a) Gleichenia linearis (Burm.) C.B.Cl. and b) Psilotum nudum (L.) P.Beauv.

Microsorum scolopendria (Burm.fil.) Copel. These plants are found on the path to waterfalls and live terrestrial. This plant has a short creeping root type, brown stype, pinnatifid lamina type, undulate pinnule margin type, pinnule acuminate apex type, sorus exudisate type, and no indusium, submedial sorus location, and vein reticulate type can be seen on Figure 6b. Cyathea contaminans (Wall. Ex Hook.) Copel. This plant is found on the
path to the waterfall. This plant has rhizoid types such as fibers and is black, upright trunk and black in color, hairy stipe, hard texture, cylindrical shape, yellow, sorus is located under the surface of the duan close to the ribs and brown, sorus is grouped and round, type pinna pinnatus pinnatifid, green pinna, smooth texture, free-stretching venation pattern and bulbous tip, exindusiate sorus type, no indusium, and terrestrial life can be seen on Figure 7.

*Davallia pentaphyla* Blume This plant is found epiphytes in Dicksonia blumei. This fern has long creeping rhizome, pinnatus pinnatifid, lamina crenate shape, hairy stype, marginal sorus location, and cup-shaped sorus indium can be seen on Figure 8a. *Dicksonia blumei* (Kunze) T. Moore This plant is found on the path to the waterfall. This plant has a hairy stype that is brownish red, tripinatus, the shape of the serrated lobe lamina, the location of the sorus extending beyond the margin, and the sorus is covered with a bivalvate indusium can be seen on Figure 9a.

*Davallia trichomanoides* Blume This plant was found attached to Araucaria cunninghamii. This plant has long creeping hairy rhizome, pinnatifid tripinatus, strong stalk-like hair and stems, triangular laminae, serrated pinna type, sorus is marginal, and has indium can be seen on Figure 9b. *Ctenitis vilis* (Kunze) This ching plant is found on the path to the waterfall. This plant has the frond pinnatus type, scaly stype with blackish-brown scales, acuminate tip, serrate edge, sterile pinna and fertile pinna with the same shape and size, and a linear sorus with brownish-red color can be seen on Figure 9c.

*Telypteris rudas* (Kunze) This plant proctor is found on the path to the waterfall. This plant has a stipe surface such as hair or scales with brownish red, tripinatus, pinna green, smooth surface, and terrestrial life can be seen on Figure 6c. *Adiantum bifidulum* Sw. This plant is found on the path to the waterfall. This plant has brown rhizome, fine-textured stipe, cuboid shape, no hair, green pinna color, arthriaceae vein, dark green pinna, falcate shape, crenate incision shape, basal pinna obtuse, apical pinna acuminate, no hair, the pattern of tip venation touching the margin, no location, and shape of sorus, pinnatifid lamina pinnatus shape, and terrestrial inhalation can be seen on Figure 10c.

*Bolbitis quoyana* (Gaud.) This herb ching is found on the path to the waterfall. This plant has a fine-textured stype, cuboid shape, no hair, arthriaceae vascular bundles, dark green pinna, falcate shape, crenate incision form, truncate basal shape, apical acuminate shape, no hair, end venation pattern touching the margins, location and sorus form, pinnatifid lamina pinnatus form, and terrestrial life can be seen on Figure 10a. *Selaginella ornata* (Hook & Grev.) This spring plant is found on the path to the waterfall. This plant has a light green pinna, triangular shape, not incised, biauriculate basal shape, obtuse apical shape, and terrestrial life can be seen on Figure 10b.

*Drynaria pleuridioideas* Presl This plant is found in the path to the waterfall. This plant has pinnatus type branching, pectinate type, large sorus, medial sorus position, light brown sorus, and terrestrial life can be seen on Figure 10c. *Gleichenia linearis* (Burm.) C.B.CI. This plant is found on the path to the waterfall. This plant has fibrous roots, upright with two branches, each branch will dichotomous, sorus is located in each leaflet, limited spread of leaflets in each leaf bone, and sorus type is like kidney (reiform) can be seen on Figure 11a. *Psilotum nudum* (L.) P. Beauv. This plant is found on the path to the waterfall. This plant has a reduction in the lamina, but there is an enation (thorn-like structure), tubular-shaped stype, dichotomous branching, sorus round indusium (peltate), and live epiphytes can be seen on Figure 11b.

**CONCLUSIONS**

Based on observations, 29 species of ferns were found and identified, consisting of *Ophioglossum reticulatum* L., *Selaginella caudata* (Desv.) Spring, *Davallia denticulata* (Burm.) Mett. & Kuhn, *Adiantum capillus-veneris* L., *Asplenium adiantum-nigrum* L., *Dryopteris sparsa* (Ham.) Kunze, *Angiopteris evecta* (G.Forst.) Hoffm., *Dipteris conjungata* Reinw., *Pleopeltis heterocarpa* Bedd., *Phegopteris connectilis* (Michx.) Watt, *Asplenium nidus* L., *Polystichum aculeatum* Roth, *Tectaria crenata* Cav., *Pityrogramma calomelanos* (L.) Link, *Pteris biaria L., Nephrolepis biserrata* (Sw.) Schott, *Microsorum solopendra* (Burm.fil.) Copel., *Cayathea contaminans* (Wall. Ex Hook.) Copel., *Davallia pentaphylly Blume*, *Dicksonia blumei* (Kunze) T. Moore, *Davallia trichomanoides* Blume, *Ctenitis vilis* (Kunze) Ching, *Telypteris rudas* (Kunze) Proctor, *Adiantum hispidulum* Sw., *Bolbitis quoyana* (Gaud.) Ching, *Selaginella ornata* (Hook & Grev.) Spring, *Drynaria pleuridioideas* Presl, *Gleichenia linearis* (Burm.) CBCI., and *Psilotum nudum* (L.) P. Beauv.

Each fern that has been found during observation has a spotted character that can be used as a basis for observing and identifying further the types of ferns. Based on the observations of ferns, it is known that one fern plant has differences in the stype, sorus, rhizome, pinna shape, and venation. This fern is a plant that can grow anywhere according to its type with different substrates. Because of these differences, ferns are diverse or come in various species.
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