PROC. INTERNAT. CONF. SCI. ENGIN.
Volume 4, February 2021
Page 105-110

ISSN 1504607797
E-ISSN 1505707533

Magnoliophyta Division Plant Diversity (Typical) in Imogiri Bantul Nature Reserve

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Abstract. Indonesia is rich in biodiversity, one of which is planted. The results say Indonesia is estimated to have 25% of the world's flowering plant species. However, not many people know what plant wealth is in Indonesia. Even the diversity of plants from the surrounding environment is sometimes ignored, even after the location is used as a protection or conservation area, but many still do not understand what is conserved in it. One of the conservation is Imogiri Nature *Reserve, which* is a production forest area of the Forest Office of Yogyakarta Special Region area of 11.4 ha. It is *the location* of *the Imogiri nature reserve area* is in the area of Imogiri King's Tomb Complex located in two villages namely Wukirsari Village and Girirejo Village which belongs to imogiri sub-district, Bantul Regency. This research aims to find out and introduce the diversity of Magnoliophyta (typical) in imogiri nature reserve. Research using roaming methods consists of the stage of data retrieval and identification. Research on the plant diversity of the Magnoliophyta division (typical) in Imogiri Nature Reserve obtained data from 2 classes, namely Magnoliopsida and Liliopsida which are rare plants found around the community consisting of 15 orders, 17 families and 19 species. The typical Magnoliophyta plant is dominated by the Magnoliopsida class.

Keywords: Plant diversity, Magnoliophyta, Imogiri Nature Reserve

INTRODUCTION

Indonesia is an island nation located in the tropics with an area of about 9 million km2 (2 million km2 landmass, and 7 million km2 of ocean) with various biodiversity. These geographical conditions make Indonesia rich in biodiversity. For plants, Indonesia is estimated to have 25% of the world's flowering plant species or is the seventh largest country with 20,000 species, 40% is endemic or native to Indonesia (Kusmana and Hikmat, 2015).

Flowering plants are estimated to reach 90% of all plant species that are widespread in the world or equivalent to 235,000 species to 400,000 types of Magallon or 236,000–352,000 types of flowering plants. Conservation International's results in 1988 stated that Malesia belongs to the Megadirve region and the phytogeography of endemic flora in it reaches 70%. Malesiana is a geographical boundary of the distribution of plants whose regions include: Indonesia, Malaysia, Singapore, Brunei Darussalam, philippines, Papua Nuigini and Timur Leste. These regions are united as a biogeography area because they have a specific plant diversity in common.

This is a testament to Indonesia's natural wealth, but in reality there is still more effort in conservation of the diversity. Because of the many endangered biodiversity and the lack of public knowledge to preserve it. Even the diversity of plants from the surrounding environment that is often ignored even after the location is used as a protection or conservation area but many still do not understand what is conservation in it that is actually able to provide information such as natural knowledge that will help the delivery of materials in the school and also the introduction to students. One of the areas in Indonesia that has a wealth of nature and diversity of plants is The Special Region of Yogyakarta with various natural attractions and conservation areas spread from mountains to beaches. Some of these attractions have not been visited much.

One of the natural tourism objects that is also a conservation area is imogiri nature reserve of 11,4 ha located in Bantul Regency, which has not been touched much besides because it has not been opened for a long time also not many people know especially students about the diversity of plants in Imogiri Nature Reserve even though their residence is still around the area. Therefore it is necessary to follow up because at the location of Imogiri Bantul Nature Reserve also does not have a database or list of plants conserved there, for that research is done.

This research is intended in addition to the introduction of Magnoliophyta plants (typical) in Imogiri Bantul Nature Reserve is expected to be a source of knowledge and research referendum for students and students, as a source of information or database of magnoliophyta plant diversity (typical) in Imogiri Bantul Nature Reserve, as well as fostering a love of natural wealth so that there is a conservative attitude towards plant species.

MATERIAL AND METHODS

This research consists of observation stage, plant data retrieval, plant identification, inventory and classification. Field observations at the beginning of the study were conducted to determine the location of data retrieval in Imoiri Bantul Nature Reserve.

1. Time and Place

The study was conducted in January-February 2020. Located in Imogiri Bantul Nature Reserve area along an uphill trail about ±500 meters on the west side as a data retrieval area.

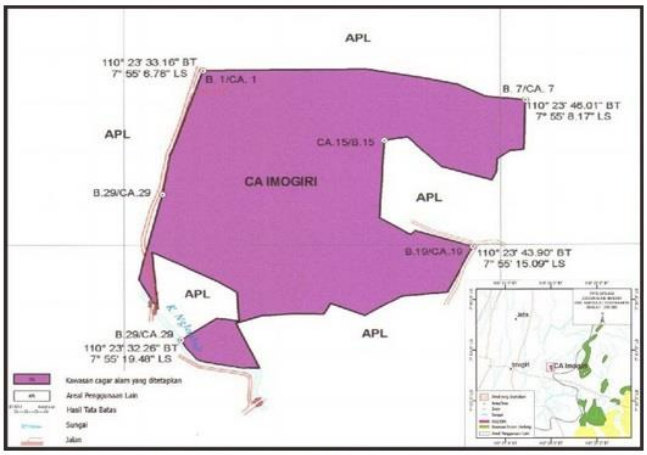

Figure 1. Map of the Imogiri Nature Reserve (BKSDA Yogyakarta, 2012)

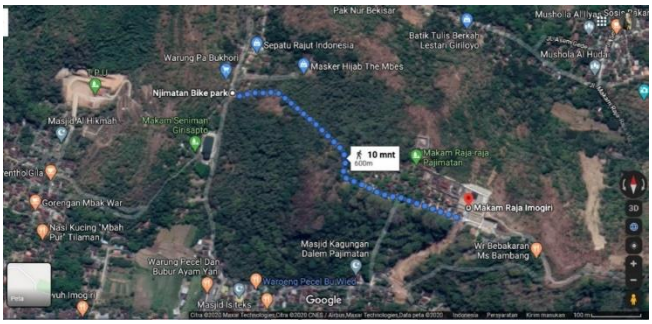

Figure 2. Research Area in Imogiri Nature Reserve

2. Tools and Materials

a. The tools used in this research include cutters, Canon EOS 1100D and Canon EOS M200 cameras, stationery, rulers, field notebooks and sources for plant identification such as: Plant Taxonomy: Gembong Tjitrosoepomo, Plant Systematics Book and Flora Encyclopedia.

b. While the materials needed in this research are plants found in the research area of the Imogiri Nature Reserve.

3. Data Collection Method

The data collection method used in this research is the roaming method. The roaming method is a method used in sampling by exploring or traversing each research area and exploring the information available at that location. In this study, the area taken is an uphill path about ± 500 meters on the west side of the Imogiri Tomb.

4. Steps

a. Conducting observation or site survey as a first step to determine the part of the location to be researched in the Imogiri Bantul Nature Reserve area.

b. Determine the research location in the Imogiri Bantul Nature Reserve area covering the western area complex along the uphill path of about ± 500 meters towards the Imogiri Tomb which is part of the Imogiri Bantul Nature Reserve area.

c. Exploring places and roaming in the area to get data.

d. Any plant found along the specified path or location is photographed. The photo taken is a photo of the whole and every part (habitus, stem, leaf, flower, and fruit) of each plant. Then identified to the species level by paying attention to morphological characteristics based on identification sources and PlantNet applications.

e. Species classification, the result of species identification is the species name of a plant. Next look for and determine the classification from kingdom to species.

f. Species inventory, an activity to classify plant species data found in the Imogiri Nature Reserve, grouping based on plant taxonomy of classes in the Magnoliophyta division. The goal is to easily recognize plants that are in the magnolioside and liliopside classes.

5. Technique of data's analysis

a. The identification of plant species obtained from roaming the Imogiri Bantul Nature Reserve uses the key of determination and several sources, namely:

1) Book of Plant Systematics by G. Singh
2) Kurnia, Nani., Jumadi, Oslan., And Hiola, St. Fatmawati. 2014. Plant Atlas of South Sulawesi. Makassar: Department of Biology, State University of Makassar.
3) Book Badrunasar, Anas and Santoso, Harry Budi. 2016. Wild Medicinal Efficacy. Bogor: Forda Press
4) Flora Encyclopedia by LIPI TEAM
5) APG IV, Botanical Journal of the Linnean Society
6) Plannet Plant Identification Application.

b. Plant data that has been obtained are sorted and grouped. Ordered based on phylogenicity and recorded in a book of observations. In the form of species names, classifications and characteristics of plants.

RESULTS AND DISCUSSION

One of the above mentioned plant diversity is flowering plant or Anthophyta or also called Magnoliophyta according to Cronquist, Takht. I don't know what to do with it. (which is still related to "Magnoliid") also known as angiospermae according to Lindl. A closed seed, The flowers themselves are actually modifications of stems and leaves which are the structure of plant trees as well as plant breeding tools (Rosanti, 2013). The Magnoliophyta

division has 2 classes: Magnoliopsida and Liliopsida, 11 sub-classes, 83 orders, and 386 families; 219,300 species. The Magnoliopsida class (dichotil) consists of 6 subclasses, 64 orders, 320 families; 169,400 species as follows. The Liliopsida (monochotil) class consists of 5 subclasses, 19 orders, 66 families; 49,900 species (Singh, 2009). The APG IV system (Angiospermae Phylogeny Group) for flowering plants as in the journal Botanical Journal of the Linnean Society, compared to APG III, the APG IV system recognizes five new orders namely Boraginales, Dilleniales, Icacinales, Metteniusales, and Vahliales (APG IV, 2016).

Research on the diversity of Magnoliophyta (typical) in imogiri nature reserve for field data collection was conducted in January-February 2020. The research was conducted using cruising methods and techniques that include observation stages, plant data retrieval, identification, inventory and classification. Field observations at the beginning of the study were conducted to determine the point at which the data was retrieved. Research on the plant diversity of the Magnoliophyta division (typical) in Imogiri Nature Reserve obtained data from 2 classes, namely Magnoliopsida and Liliopsida which are rare plants found around the community consisting of 15 orders, 17 families and 19 species.

Table 1. List of Class Magnoliopsida plants

No	**Nama Ilmiah**	**Ordo**	**Nama Famili**
1.	*Anomianthus dulcis*	Magnoliales	Annonaceae
2.	*Memecylon* sp.	Myrtales	Melastomaceae
3.	*Memecylon caeruleum*	Myrtales	Melastomaceae
4.	*Melaleuca leucadendra*	Myrtales	Myrtaceae
5.	*Abrus precatorius*	Fabales	Fabaceae
6.	*Flacourtia indica*	Malpighiales	Salicaceae
7.	*Helicteres hirsuta*	Malvales	Malvaceae
8.	*Ehretia microphylla*	Boraginales	Ehretiaceae
9.	*Ixora pendula*	Gentianales	Rubiaceae
10.	*Oroxylum indicum*	Lamiales	Bignoniaceae
11.	*Tetracera indica*	Dilleniales	Dilleniaceae

The above data is the eleven species of the Magnoliopsida class which is a typical plant of the Magnoliophyta division in the Imogiri Bantul Nature Reserve, now it is starting to be difficult to find around the environment. Even some such as *Ixora pendula* and *Memecylon* are rare plants of the world.

Figure 3. Photos of species Magnoliophyta plants of Class Magnoliopsida (*a. Anomianthus dulcis, b. Memecylon* sp., *c. Memecylon caeruleum, d. Melaleuca leucadendra, e. Abrus precatorius, f. Flacourtia indica, g. Helicteres hirsuta, h. Ehretia microphylla, i. Ixora pendula, j. Oroxylum indicum, k.Tetracera indica*)

Anomianthus dulchis has the characteristic leaves are wide oblong with yellow/orange flowers or orange, the fruit is green when young then yellow and red when it is old.

Good *Memecylon* sp. and *Memecylon caeruleum* have almost the same characteristics. The leaves are egg-round and shiny. Compound flowers on the armpits of the leaves, in groups forming short bunches, 1.5-3 cm, consisting of 8-15 flowers, are white for *Memecylon* sp. and purple flowers for *Memecylon caeruleum*. Pistil consists of 1 and stamens consist of 8 pieces, the head of the cider is uniquely shaped like the letter s, white. Inflorescences January-Dec.

Melaleuca leucadendra has the characteristic of whitish-gray stems whose crusts are peeled off in the form of rather thick sheets and are sepon-like. Single leaves, short stemmed, wake up jorong or elongated. The flowers are ivory yellow, pink, or lembayung arranged in a grain that comes out of the armpits of the leaves. The fruit is box-shaped and the seeds are smooth like chaff.

Abrus precatorius has even compound saga leaves. The leaves are green with the shape of a child round egg or oblong leaves slightly curved. The pods are striking red with a black-stained base.

While *Flacourtia indica* has a special characteristic that the stem is spiked 10cm long, the leaves are serrated, the fruit is round green.

In *Helicteres hirsuta*, the leaves are serrated. The fruit is round elongated hairy greenish brown, when old and dries brown-black. The flowers are small pink.

Ehretia microphylla, the leaves have various sizes and shapes, the texture is rough, shiny but covered with hair. The fruit is in the form of small berries, when young it is green and slowly turns yellow and then solid orange when ripe.

Ixora pendula, is a forest soka that grows wild. The leaves are leathery, ranging from 3 to 6 inches long, and produce large clusters of small flowers, in tropical climates the flowers bloom all year round. Flowers are white in color and include compound interest types. The fruit is small round green.

In *Oroxylum indicum*, compound leaves are pinnate, opposite, elliptical, the upper surface is dark green, shiny.

Tetracera indica, dark green leaves, jarong shape, slightly hairy leaf surface, serrated leaf edges, pointed leaf base, tapered leaf tip; petiole slightly hairy; sitting leaf (philotaxis) alternating.

Table 2. List of Class Liliopsida plants

No	**Nama Ilmiah**	**Ordo**	**Famili**
1.	*Amorphophallus paeoniifolius*	Alismatales	Araceae
2.	*Amaryllis* sp.	Aspargales	Asparagaceae
3.	*Dioscorea hispida*	Dioscoreales	Dioscoreaceae

4.	*Tacca palmata*	Dioscoreales	Dioscoreaceae
5.	*Gloriosa superba*	Liliales	Colchicaceae
6.	*Smilax celebica*	Liliales	Smilacaceae
7.	*Pandanus tectorius*	Pandanales	Pandanaceae
8.	*Costus speciosus*	Zingiberales	Costaceae

The above data is data on eight plant species from the liliopsida class. Which is many and is a hallmark of Imogiri Bantul Nature Reserve. It is also rare to be found around residential environments and become a rare plant.

Figure 4. Photos spesies Magnoliophyta plants of Class Liliopsida (*a. Amorphophallus paeoniifolius, b. Amaryllis* sp., *c. Dioscorea hispida, d. Tacca palmata, e. Gloriosa superba, f. Smilax celebica, g. Pandanus tectorius, h. Costus speciosus*).

Amorphophallus, the leaves share three as if they consist of 3 leaflets, even though a single leaf is visible from the leaflets. Green leaves, green petioles decorated with white spots and streaks. The stalk when touched will feel rough. Stems are short, invisible because they are buried in the ground. The roots of the fibers are scattered around the stem tuber. Medium-sized flowers, appearing after the leaves die, the inflorescences are reddish brown or maroon brown, consisting of 2 parts, namely seludang and cob

Amaryllis, wide leaves can reach about 20 cm with a smooth surface. Long leaves with flat edges are green. Frond leaf and spiral leaf arrangement.

Dioscorea hispida, 5-10 meters long rounded stem, grows to climb or wrap around large plants or also creeps. Stems dark green or dull green ebrduri stems and coarse-haired tubers. The roots of gadung fibers grow into large bulbs or sometimes one plant can have 20-50 tubers that grow in the soil. The tubers are poisonous and dangerous for humans and animals because there are alkaloids, namely dioscorim, which can interfere with the respiratory nerves. The leaves are green and heart-shaped, the type of leaves is compound and bear leaves 3. The tips of the leaf sheets are sharp. The stalk of the leaf is long enough. Gadung flowers are white or yellowish in color, with a sheath of flowers that are typical of monocot plants.

In *Tacca palmata*, the leaf blade is split into 5-7 parts. The upright inflorescence is in the form of an umbrella, hard-stemmed and equipped with two protective leaves. Each inflorescence contains 8-25 flowers. Small rounded fruit, bright red.

Gloriosa superba, stems are green, stems have branching. Leaves are oval or lanceolate with pointed leaf tips that grow to form tendrils, tendrils used for climbing. Green leaves attached to the stem Flowers come out from below in the form of a flower. 6 sheets of flower tent in lanceolate and curly shape. The color of the tent first turns green at the bottom, the top is brown, then the bottom turns yellow and the bottom turns red, the flower awns turn red. 6 blades of stamen, yellow stalks, boat-shaped head sari. The root type is the rhizome.

Smilax celebica, woody stem, smooth, has very sharp thorns, creeping up and green. Single leaf, lanceolate, alternate. There are black-purple and white spots on the leaf surface.

Pandanus tectorius, Pandan duri has a special leaf to build a long sword. Most have spines along the edges and bony leaves.

Costus speciosus, stems are round, grow upright, 2-4m high, green, slightly woody, and sections. The leaves are green, ovate to oblong, and hairy. The leaves are pointed tipped, smooth on top and hairy on the bottom. Flowers in the form of weevils, multiple sexes, white or white crown with purple stripes, pollination is assisted by wind and insects. Root fibers are white or dirty yellow.

The two plant data from the two classes that dominate are plants from the Magnoliopsida class.

CONCLUSIONS

Research on the plant diversity of the Magnoliophyta division (typical) in Imogiri Nature Reserve obtained data from 2 classes, namely Magnoliopsida and Liliopsida which are rare plants found around the community consisting of 15 orders, 17 families and 19 species. The typical Magnoliophyta plant is dominated by the Magnoliopsida class.

ACKNOWLEDGEMENTS

Thank you for all member panitia ICSE and speakers. I am deeply indebted to my supervisor, Professor Dr. Widodo, M. Pd. Head of Departement of Biology Education, for warm support, inspiration and thoughtful guidance. Special thanks for my friends always support and finally i am indebted to my parents, my grandpa and grandma, my little sister and brother too. I love you.

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