



DIVERSITY of EPIPHYTIC FERN on THE OIL PALM PLANTS

(*Elaeis guineensis* Jacq.) in Campus of Sriwijaya University Indralaya

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Peer review under responsibility of Biology Department Sriwijaya University

Abstract

The Campus of Sriwijaya University in Indralaya, has a high diversity of flora including fern, especially the epiphytic ferns, whose existence is so widely found in oil palm plants. This epiphytic study has been conducted from July to November 2017, with the aim of identifying the diversity of species of epiphytic ferns in oil palm plants on the campus of UNSRI Indralaya. The research method used is exploration method with direct collection technique from the field and then made herbarium. In this study found 27 species, which belong to 7 families, namely Aspleniaceae, Blechnaceae, Davalliaceae, Lygodiaceae, Nephrolepidaceae, Polypodiaceae, and Vittariaceae. The most common types are Polypodiaceae family *Drynaria quercifolia*, *Drynaria sparsisora*, *Microsorium pustulatum*, *Microsorium punctatum*, *Phymatosorus scolopendria*, *Polypodium verrucosum*, *Polypodium polystichum*, *Pyrosia piloselloides*, and *Goniophlebium verrucosum*. The most widely distributed species in oil palm is *Davallia denticulata*, *Goniophlebium verrucosum*, and *Nephrolepis biserrata*.

Keywords: Epiphytic fern, Oil palm plant, Campus UNSRI Indralaya,

Received: 22 June 2018, Accepted: 28 October 2018

1. Introduction

One type of biodiversity of the flora in Indonesia is a pterydophyta which is a cormophyta sporae plant. Ferns have a heterogeneous species, both in terms of habitus and way of life [1]. On the surface of the earth is reported there are 13,000 species of ferns. In the Malesia region comprising almost the Indonesian archipelago, the Philippines, Guinea and Northern Australia there are an estimated 4,000 species of ferns whose majority are Filicinae [2]. According to [3] there are about 10,000 species of ferns in the world and 3,000 of them grown in Indonesia.

Campus UNSRI Indralaya has a variety of plants that are high, especially for ferns, which live in terrestrial and epiphytes. Based on research [4] found 20 species of ferns consisting of 8 families and 16 genera. Of the 20 species are 16 species of terrestrial ferns, then 3 species of epiphytic ferns and only 1 aquatic ferns. The results of exploration conducted by [5] found 30 species and 11 families, consisting of 24 species of herbaceous plants and 6 species belonging to the bush. In this study there were 11 species of epiphytic ferns, including *Asplenium caudatum*, *Davallia denticulata* and *Microsorium scolopendria*,

Asplenium nidus and *Nephrolepis biserrata*, which live on various host species, one of which is the oil palm plants (*Elaeis guineensis*).

Campus of Sriwijaya University in Indralaya, dominated by oil palm plantations and in this plant are often found epiphytic ferns. In the tree there are many skin cracks from the former midrib so as to enable strongly attached to the nail root in the shade of the tree. According to [5] epiphytic spikes can be found with considerable distribution on palm oil, such as *Asplenium caudatum*, *Asplenium nidus*, *Davallia denticulata*, *Microsorium scolopendria*, *Nephrolepis biserrata* and *Polypodium verrucosum* [6] explains that *Elaeis guineensis* has a lot of midrib that will be able to accommodate litter that is useful for the provision of nutrients and moist habitat for the growth of epiphytic ferns. Further, according to [7] morphology palm oil has an environment suitable for the growth of epiphytic ferns, because the base of the petiole is widened so that it can accommodate organic litter and other inorganic materials.

Due to the still limited information on the types of epiphytic ferns in oil palm plants, especially on the campus of UNSRI Indralaya, this research needs to be done, with the aim to know the types of epiphytic ferns on oil palm plants in Campus UNSRI Indralaya.

2. Materials and Method

The research was carried out in Campus UNSRI Indralaya from July to November 2017. Tools used include plastics, rulers, stationery, digital cameras, and books identification of nail plants. Materials of epiphytic ferns found in palm and alcohol. The research method used is the exploration method with the technique of direct collection of samples from the field and then dried for making the herbarium to be identified. Identification of the type of epiphytic ferns was performed based on observations of morphological characters (rhizome and leaf).

3. Results and Discussion

From the results of identification of the diversity of species of epiphytic ferns on oil palm plants at Campus of Sriwijaya in Indralaya, found 27 species belonging to 7 families. The families are Aspleniaceae and Lygodiaceae (2 species), Blechnaceae and Davalliaceae each 3 species, Nephrolepidae and Vittariaceae (4 species for each, while 9 polypodiaceae are listed in Table 1.

Table 1. Diversity of species of epiphytic ferns in oil palm plant on Campus of Sriwijaya University in Indralaya

Family	Species
Aspleniaceae	<i>Asplenium caudatum</i> Forst. <i>Asplenium nidus</i> L.
Blechnaceae	<i>Stenochlaena milnei</i> (R.Br.) Mett. <i>Blechnum patersonii</i> (R.Br.) Mett. <i>Stenochlaena palustris</i> (Burm.f.) Bedd
Davalliaceae	<i>Davallia denticulata</i> (Burm. F.) Mett. Ex. Kuhn <i>Davallia solida</i> (G.Forst.) Sw. <i>Davallia trichomanoides</i> Blume
Lygodiaceae	<i>Lygodium scandens</i> (L.) Sw. <i>Lygodium flexuosum</i> (L.) Sw.
Nephrolepidaceae	<i>Nephrolepis biserrata</i> (Sw.) Schott <i>Nephrolepis exaltata</i> (L.) Schott <i>Nephrolepis falcata</i> (Cav.) C. Chr. <i>Nephrolepis hirsutula</i> (G. Forst.) C. Presl
Polypodiaceae	<i>Drynaria quercifolia</i> (L.) J.Sm <i>Drynaria sparsisora</i> (Desv.) T.Moore <i>Microsorium pustulatum</i> G.Forst.) Copel <i>Microsorium punctatum</i> (L.) Copel <i>Phymatosorus scolopendria</i> (Burm. f.) Pic. Serm

Polypodium verrucosum (Hook.) Wall
Polypodium polysthicum
Pyrrosia piloselloides (L.) M.G. Price
Goniophlebium percussum (Cav.)
Wagner & Grether

Vittariaceae *Vittaria ensiformis* Sw
Vittaria elongata Sw.
Vittaria graminifolia Kaulf
Vittaria scolopendrina (Bory) Schkuhr
ex Thwaites

Based on the above data it can be seen that the type of epiphytic ferns found in oil palm plants in campus UNSRI Indralaya more when compared with the results of research [5] who get 5 families consisting of 9 species, namely *Asplenium caudatum* Forst., *Asplenium nidus* L., *Davallia denticulata* (Burm.) Mett., *Drymoglossum piloselloides* (L.) Pr., *Drynogic sparsisora* Moore., *Microsorium scolopendria* (Burm.) Copel., *Nephrolepis biserrata* (Sw.) Schott, *Odontosoria chinensis* (L.) J Smith., *Polypodium verrucosum* (Hook.) Wall.,

The large variety of epiphytic ferns found due to differences in observation time, where previous research was conducted during the dry season, so that the possibility of epiphytic ferns can not be found, while the study was conducted at the time of the rainy season and in the rainy season, so that many spores of ferns germinated and grow into new individuals. These ferns tend to like the abundant water conditions because one stage of life depends on the presence of water.

The type of epiphytic ferns found in the Campus UNSRI Indralaya is also more diverse when compared to [7] study on palm oil trunks in Pekanbaru, Riau. In this study found 16 species of epiphytic ferns, which belong to 7 families, namely Polypodiaceae (five species: *Microsorium pustulatum*, *Microsorium punctatum*, *Phymatosorus scolopendria*, *Pyrrosia piloselloides*, *Goniophlebium percussum*, 3 species Aspleniaceae (*Asplenium nidus*, *Asplenium crinicaule*, *Asplenium monanthes*) 3 types of Davalliaceae (*Nephrolepis biserrata*, *Nephrolepis hirsutula*, *Davallia denticulate*, and 3 species, and Vittariaceae (*Vittaria ensiformis*., *Vittaria graminifolia*, *Vittaria scolopendrina*) .The types of Blechnaceae are *Stenochlaena palustris* and Gleicheniaceae are *Dicranopteris linearis* .

More variant types of epiphytic ferns are found due to differences in environmental conditions, where the palm oil plants in the campus UNSRI Indralaya in a more open place and get plenty of sun, and canopy leaf of a leafy palm, and has a high humidity, ie about 52.5%. The presence of similar types of epiphytic ferns was found to be possible because of the same environmental conditions as well as the habitat of epiphytic ferns found mostly sheltered from direct sun or moisture, otherwise the same climate between the two locations of wet tropics can also be a

factor in the similarity of epiphytic spikes. This is confirmed by [8] that environmental factors can affect the occurrence of unlike species such as light intensity, air humidity, temperature and so forth.

Research [9] on the epiphytic spikes community on palm oil stems in Malaya Archipelago is found in six types of epiphytic ferns: *Nephrolepis biserrata*, *Davallia denticulata*, *Vittaria ensiformis*, *Asplenium nidus*, *A. glaucophyllum* and *A. longissimum*, commonly found in oil palm by sharing variations in height of trees 1-8,5 m. The initial invasion of the ferns community on oil palm was carried out by *N. biserrata* and *D. denticulata*. The microhabitat of *N. biserrata* is in the area exposed to light, whereas *V. ensiformis* on the stem is protected. Furthermore it is said that there are 4 types of nails namely *Vittaria elongata*, *Drynaria sparsisora*, *Polypodium* sp and *Phymatosorus scolopendria* found only in trees that are above 5.5 m high. *Asplenium nidus*, *A. glaucophyllum*, *Vittaria ensiformis* and *Stenochlaena palustris* are found in stems with a height of 4 m.

According to Table 1. it is known that the most common type of epiphytic ferns found in oil palm is from Polypodiaceae family, with *Drynaria quercifolia*, *Drynaria sparsisora*, *Microsorium pustulatum*, *Microsorium punctatum*, *Phymatosorus scolopendria*, *Polypodium verrucosum*, *Polypodium polystichum*, *Pyrrosia piloselloides* *Goniophlebium percussum*. Among these species, ferns belonging to dimorphic ferns, such as *Pyrrosia* and *Drynaria*, which have different frond forms between fertile and sterile fronds.

Polypodiaceae is an epiphytic ferns mostly found in the center of the palm oil, where in this part the spores carried by the wind are more easily attached to the stem. More easily attached. While the most common types of epiphytic nails found in oil palm are Davalliaceae, and Nephrolepidaceae [10]. The Davalliaceae types found are *Davallia denticulata*, *Davallia solida* and *Davallia trichomanoides*, whereas for Nephrolepidaceae consists of *Nephrolepis biserrata*, *Nephrolepis hirsutula*, *Nephrolepis exaltata*, and *Nephrolepis falcata*. These types are in number very much found on the bottom to the top of the oil palm plants. According to [7] in nature, this fern grow in a wide variety of situation, such as in the soil, among rocks or as an epiphyte. All types of *Nephrolepis* are fertile throughout the year and spread through spores, stolons and tubers.

Nephrolepis biserrata, *Goniophlebium verrucosum*, and *Davallia denticulata* are the most common types of palm oil. This is similar to the findings of [12] that the ferns are also found in oil palm plantations in Malaysia and Singapore. *Vittaria elongata* and *Vittaria ensiformis* are the most common species found in oil palm plantations, especially in old oil palm plantations. High density of the species obtained in *Nephrolepis biserrata*, indicating that this species is suitable to live on oil palm

plantations and not affected by geography, humidity temperature and other environmental factors. It is likely that this is due to nutrients and palm oil palm grown in accordance with this type of need.

4. Conclusion

1. Based on the results of identification found 27 species of epiphytic ferns of 7 different families, such as Aspleniaceae and Lygodiaceae (2 types), Blechnaceae and Davalliaceae (3 species) Nephrolepidaceae and Vittariaceae (4 species) while Polypodiaceae as many as 9 species,
2. *Davallia denticulata* and *Nephrolepis biserrata* are epiphytic ferns that have widespread spreading in oil palm plants in Campus UNSRI Indralaya
3. Polypodiaceae most commonly found are *Microsorium punctatum*, *Microsorium pustulatum*, *Phymatosorus scolopendria*, *Pyrrosia piloselloides* and *Goniophlebium percussum*.

5. Acknowledgement

Acknowledgement is written if this article is financially supported from institutions or university fund.

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