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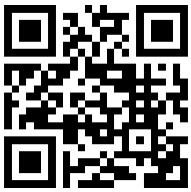
Diversity of EPIFIT Orchid Types in the Mangrove Ecosystem in Ayari Village, Teluk Ampimoi Sub District, Yapen Islands District, Papua Province, Indonesia



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ABSTRACT: This research was conducted in Ayari village, Teluk Ampimoi sub District, Yapen Islands District for approximately two months or from November to October. The research objective was to determine the types of epiphytic orchids and their presence. The method used in this research is descriptive method with observation and documentation techniques. The results of this study found as many as 6 genera consisting of 16 species of epiphytic orchids, which grow on 3 types of mangroves. There are environmental factors that affect the distribution of mangroves that can have an indirect effect on orchids, namely: salinity, sunlight intensity and wind speed.

KEYWORDS: Epiphytic Orchid, Dendrobium, Mangrove, Ayari, Yapen Islands

INTRODUCTION

Orchid is the general name for all types of plants in the *Orchidaceae* family (orchid family). This family is one of the largest groups among other flowering plants. The orchids are a family of flowering plants with the most members. Its species are widespread from the wet tropics to the circumpolar region, although most of its members are found in the tropics (Rosyadi, 2010).

It is estimated that around the world there are around 15,000-20,000 species of orchids with 900 genera (clans) which are endemic plants in forests spread over 750 countries. There are around 5,000 species of orchids in the world, of which there are in Indonesia (Agung, 2006). In Papua there are approximately 2,000 species of orchids, ranging from those that live on the beach to the high mountain slopes. The types, sizes, shapes and colors vary according to the habitat where they grow. Dendrobium violaceum, subspecies violaceum is an orchid that is widely found in New Guinea (the area includes Papua and Papua New Guinea), to be precise in mountain forests which reach an altitude of 2,000 meters above sea level (Agung, 2006). The spread of orchids in Papua varies greatly from the lowlands to the highlands. The spread of orchids in Papua varies greatly from the lowlands to the highlands. The distribution of orchids in the natural forest area of Kampung Sidey spreads at an altitude of 4-12 meters above ground level and 10-15 meters above sea level (Jumriani, 2006). Epiphytic orchids also grow and develop very well in the Cycloop Mountains Nature Reserve (Arobaya et al. 2022). According to their habitat, orchid plants are divided into four groups, namely: epiphytic orchids (living attached to the host tree without harming the host), lithophytes (growing on rocks), saprophytes (growing on humus and dry leaves) and terrestrial orchids (living on in soil).

Mangrove forests are a group of plant species that grow along tropical and sub-tropical coastlines that have a special function in an environment that contains salt and landforms in the form of beaches. Mangrove forest ecosystems are called brackish forest ecosystems because they are found in brackish areas, namely water areas with a salt content or salinity between 0.5 and 30, which are also called tidal ecosystems (Indriyanto, 2006). Mangrove ecosystems also dominate in several areas in the Ampimoi Bay District, Yapen Islands Regency. The total area of this regency is 19,994 km2 or 4.6% of the land area of Papua province. According to the "Smitch and Ferguson" classification, this district is classified as a tropical climate or is called a wet tropical climate. It is characterized by high humidity, air temperature which changes every day throughout the year, and the rainy season which is influenced by the west, east and south seasons. This is what affects the diversity of flora and fauna including the diversity of orchid species in the Yapen Islands district, this condition certainly holds potential that needs to be explored. For this reason, the study of the biodiversity of orchid plants is the main concern in this research.

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MATERIALS AND METHODS

Ayari Village is located in the Ampimoi Bay district in the Yapen Islands district geographically between 136°26'50.639" - 136°36'9.455" East Longitude and 1°47'36.808"- 1°53'57.157" South Latitude (Figure 1). The area of Ayari village is 20 km2, where 10,000 m2 of the area of the village is the mangrove distribution area. This research was conducted for approximately two months in Ayari village, Ampimoi Bay District, Yapen Islands district. To support this research the tools and materials needed include: digital camera, salinometer, pH meter, herbarium equipment, identification key book, orchid plants and 70% alcohol. All types of epiphytic orchids in Ayari village are the population of this study, while the samples are epiphytic orchids found in the mangrove ecosystem. Data were collected by line transect technique and then analyzed descriptively qualitatively. To carry out this research, there are steps that must be taken, such as: conducting an initial survey at the research location, conducting interviews with the people of Ayari village, compiling a research proposal. The next step is to present the research proposal to receive inputs. The next stage is conducting research, collecting data through interviews, processing data and tabulating research results. The collected data were analyzed by descriptive analysis.

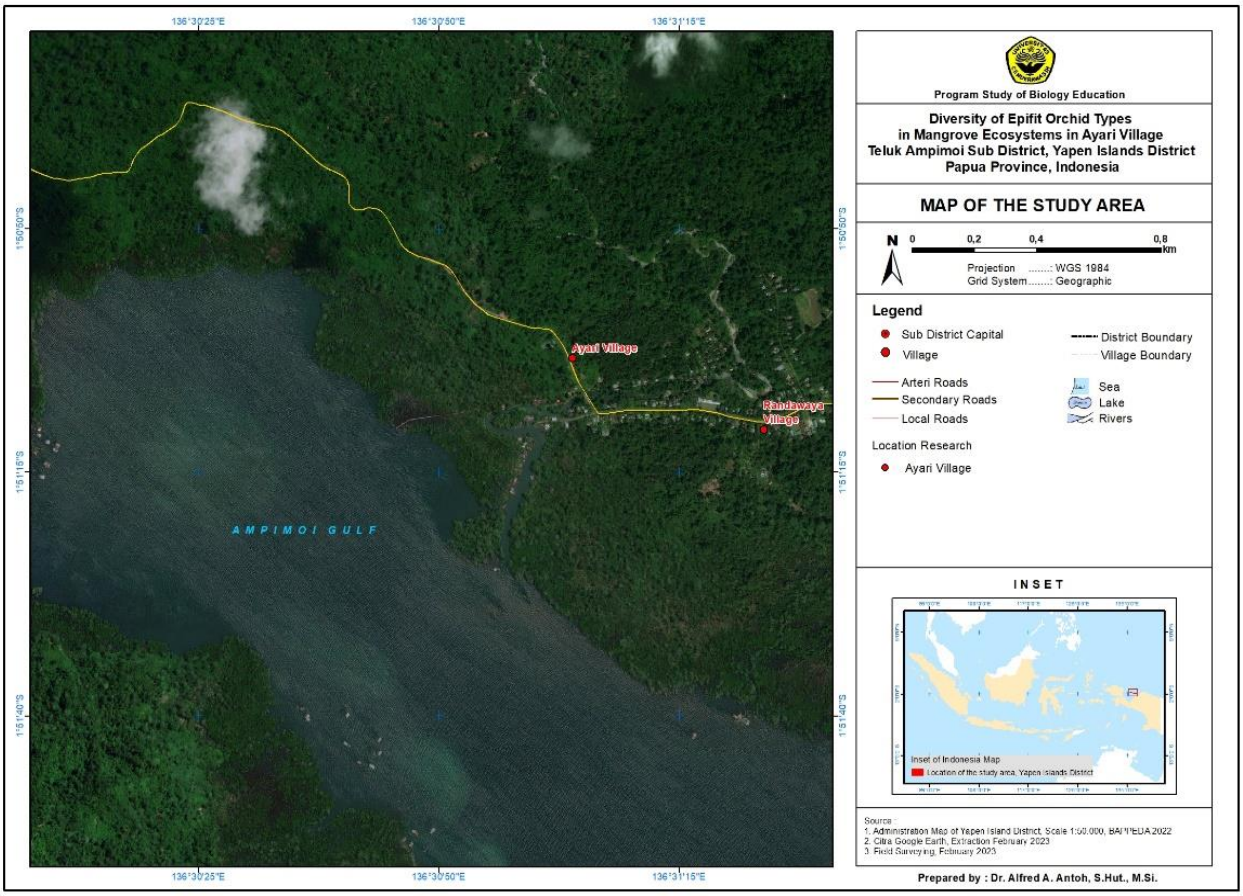

Figure 1. Map of epiphytic orchid research locations in Ayari village

RESULTS AND DISCUSSION

Based on the results of research in the mangrove ecosystem area of Ayari village, 16 types of epiphytic orchids were found consisting of 6 genera, namely: *Acriopsis, Bulbophyllum Dendrobium, Diplocaulobium, Flickingeria, Grammatophyllum,* and 16 species namely: *Acriopsis javanica Reinw ex Blume., Bulbophyllum sp1, Bulbophyllum sp2, Dendrobium antennatum Lindl., Dendrobium cancroides T.E.Hunt., Dendrobium insigne (Blume) Rchb.f., Dendrobium smillieae F.Muell., Dendrobium sp1, Dendrobium sp2, Dendrobium sp3., Dendrobium sp4., Dendrobium sp5., Diplocaulobium sp, Flickingeria comate, grammatophyllum papuanum J.J.Sm.,* Types of epiphytic orchids with their host trees as follows (Table 1).

Table 1. Types of epiphytic orchids in the mangrove forest of Ayari Village, Teluk Ampimoi District, Yapen Islands Regency

Numb.	Genus	Species	Host tree
1.	*Aeriopsis*	*Acriopsis javanica* Reinw ex Blume	*Rhizophora* sp.
2.	*Bulbophyllum*	*Bulbophyllum* sp1	*Bruguiera* sp.
		Bulbophyllum sp2	*Bruguiera* sp.
3.	*Dendrobium*	*Dendrobium antennatum* Lindl	*Sonneratia* sp.
		Dendrobium bifalce Lind	*Bruguiera* sp.
		Dendrobium cancroides T.E.Hunt	*Rhizophora* sp.
		Dendrobium insigne Blume	*Bruguiera* sp.
		Dendrobium smilieae F.Muel	*Sonneratia* sp.
		Dendrobium sp.1	*Sonneratia* sp.
		Dendrobium sp.2	*Rhizophora* sp.
		Dendrobium sp.3	*Bruguiera* sp.
		Dendrobium sp.4	*Bruguiera* sp.
		Dendrobium sp.5	*Bruguiera* sp.
4.	Diplocaulobium	*Diplocaulobium* sp.	*Bruguiera* sp.
5.	*Flickingeria*	*Flickingeria comata*	*Sonneratia* sp.
6.	*Grammatophyllum*	*Grammatophyllum papuanum* J.J.sm	*Sonneratia* sp.

Based on (Table 1) it can be seen that the most common types of orchids found in the ecosystem of Kampung Ayari are the Dendrobium genus, followed by *Bulbophylum*. *Acriopsis, Diplocaulobium, Flickingeria, Gammatophyllum.* Orchid biodiversity in the islands of Papua province also shows differences. As many as 25 types of orchids belonging to 11 genera have been identified from SPTN III Wasur (Kusumastuti et al. 2021). The results of another study that was conducted on the potential of epiphytic orchids in the mangrove forest of the Sorendiweri Strait, Supiori district found only 1 family, 10 genera and 17 species (Wanma et al., 2022). The study in the study explained that 30 morphological characters of Dendrobium had been studied. There were 23 of the 30 morphological characters identified (76.67%) which showed various characters in flowers, leaves and roots (Hartati et al. 2022). Other research explains that three types of natural orchids in the KEHATI AQUA Wonosobo Park, namely Dendrobium crumenatum, Eria retusa, and Liparis sp can be cultivated. Overall the number of orchids found was 487 individuals. These three types of orchids are epiphytic orchids which are found in 6 types of host trees for species protection and conservation (Dapala et al. 2022). Communities in Oksibil also collect several types of epiphytic orchids for specific purposes (Agustini et al, 2012).

It is also known that the host trees most commonly grown by epiphytic orchids are Bruguiera sp, Sonneratia sp, and Rhizophora sp. The association of orchid root forms has distinct morphological characteristics. It is suspected that this is related to the morphological characters of the orchid in which the form of association shows a difference in mycorrhiza that is similar to Rhizoctonia and others in adjacent locations. Observations of mycorrhizae are similar to Rhizoctonia, especially the rough texture of the skin so that epiphytic orchids can easily attach their roots (Soelistijono et al. 2020). In addition, the shape of the branches, the shape of the leaves that are wide enough and the crowns that are dense enough make this species able to create a microclimate that suits the needs of epiphytic orchids.

The mangroves found at the study site from the shoreline towards the land, namely: *Avicennia sp, Sonneratia sp, Rhizophora sp, Bruguiera sp* and the transition zone between mangrove forests and lowland forests are several types of palms. The distribution of mangrove species is influenced by the level of salinity (Kusmana et al, 2003) areas with high salinity (small amount of fresh water entering from land) are grown by mangrove species *Avicennia sp.* For areas that get an abundant supply of fresh water from land (so that the salinity tends to be low), the mangrove species Bruguiera sp. The water salinity in the location of Ayari village, Ampimoi Bay District, Yapen Islands Regency is 10-30. So salinity can affect the distribution of orchids in mangroves, although indirectly (Kusamana, 2003). The results of measurements in the field explained that *Avicennia sp.* found on the beach with a salinity between 10-30 ppt, with sandy coral and sandy plate types. It is a pioneer plant on protected coastal lands, has the ability to occupy and grow in a variety of tidal habitats even in salty areas. This species is one of the most common plant species found in tidal habitats. The roots help bind sediment and speed up the process of forming raised soil.

Sonneratia sp., is associated with *Avicennia sp.*, but this species is more landward (center) with a salinity of 10-30 ppt, sandy coral soil type, sandy slab. Pioneer species are intolerant of fresh water over long periods. Often found in coastal locations that are protected from waves, also in river mouths. Rhizophora sp. along the river with a salinity of 0-10 ppt, sandy to loamy soil

types. Research conducted in Kamora, Mimika Regency showed that the mud substrate was very good for the growth of Rhizophora (Setyadi et al. 2021). The type of substrate is very suitable and in accordance with the types of mangroves in Ayari village. It grows in diverse habitats in tidal areas, favoring tidal river banks, but not as a pioneer species in coastal environments or on the inland part of mangroves. *Bruguiera sp.* found in the interior of mangrove forests with a salinity of 0-10 ppt, soil types are dusty, dusty clay to clay. It grows along waterways, on a variety of substrate types that are not frequently flooded. Tolerant of saltwater, brackish and fresh water conditions.

CONCLUSION

The most common type of orchid found was Dendrobium sp with its host trees *Sonnerathia sp, Bruguiera sp*, and *Rhizophora sp*. The environmental factor that greatly influences the distribution of epiphytic orchids is salinity.

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