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Inventory of the Orchidaceae Family in Jorong Harapan Tinggam Community Forest Talamau Pasaman Barat District West Sumatera

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Abstract

Tinggam Community Forest is a highland tropical forest area in which many types of orchids are found. Orchids generally live as epiphytes, but there are also terrestrial ones. The purpose of this study was to determine the types of natural orchids found in the forest in the Jorong Harapan Tinggam Community Forest, Talamau District, West Pasaman Regency West Sumatera. The research method used is a descriptive survey using a roaming technique by tracing the forest from the outskirts to the forest as a whole. From the results of the study, it was found that there were 16 species, consisting of 13 epiphyte orchids, while the terrestrial orchids obtained were 3 species. The orchid species obtained were: *Agrostophyllum lampongense* Blume., *Arundina graminifolia* Hochr., *Bulbophyllum* sp., *Bulbophyllum angustifolium* Lindl., *Bulbophyllum plavescens* Blume., *Coelogyne rochussenii* Vriese., *Cymbidium* Rchb.fcrumenatum *spp . dayanum* De., *Eria iridifolia* Hook.F., *Eria pilifera* Ridley., *Grammathophyllum speciosum* Blume., *Phaius tankervilleae* Blume. *Robiquatia spatulata* Blume., *Spathoglottis plicata* Roxb., *Thelasis carinata* Blume. It can be concluded that the Jorong Harapan area is an ideal habitat for orchid growth.

Keywords*:* community forest; epiphytes; orchids; terresterial

INTRODUCTION

Orchids are included in the orchid family which according to their life characteristics are divided into epiphyte orchids, semi-epiphyte orchids and terrestrial orchids. Orchids have become high value crops in many countries including Thailand, Australia, Singapore, Malaysia and Indonesia. The beauty and beauty of orchids makes this plant called the "king of flowers" (Irawan & Kasutjianingati, 2013; Lestari *et al.*, 2019; Shidiqy *et al.*, 2019) . Orchid plants usually have two forms of stem systems, namely monopodial and simpodial. Monopodial orchids are orchids with a main stem whose growth is straight and grows indefinitely. The shape of the orchid flower has attractive colors and the flower crown is slightly thicker than the flowers that are often found in general. Orchid roots are unique, namely slippery, easy to break, have chlorophyll, and have a pointed tip (Indarto, 2011; Shidiqy *et al*., 2019; Heriansyah *et al.*, 2020).

Orchidaceae (orchids) is one of the biggest plant families that consist of approximately 25,000 species belongs to over 900 genera across the world. Orchids have high variations in the morphology of the flowers, leaves, and stems (pseudobulbs). Dendrobium is one of the orchid genera containing a large

number of species (approximately 1500 species) widely spread across the world, from Japan, China, India, the Malacca Peninsula, Indonesia, the island of Papua, to Australia. This orchid has a charming flower (Indarto, 2011; Djufri *et al.*, 2017; Lestari *et al.*, 2019). Orchid plants are a type of ornamental plant that is very prospective and has high economic value because of the attractive shape and color of the flowers and has a long shelf life. Orchid as a type of ornamental plant with all its stunning uniqueness has attracted the attention of ornamental plant enthusiasts both from within and outside the country (Djufri *et al*., 2017; Lestari *et al*., 2019; Shidiqy *et al*., 2019). Orchids are one of the tribes that have the most species members compared to some other flowering plant families. Orchid life is spread from the lowlands to the mountains, or wet forests to dry forests. Worldwide, the number of orchids is estimated to be 17,000 - 35,000 species from 450 - 850 genera. In Indonesia it is estimated that there are 4,000 - 5,000 species (Sadili & Sundari, 2013; Lestari *et al*., 2019; Heriansyah *et al*., 2020).

From research conducted by (Prapitasari *et al*., 2020) at the Selabintana Resort of Gunung Gede Pangrango National Park (TNGGP) West Java, 36 species were found on the hiking trail consisting of 20 terrestrial orchids and 16 epiphyte orchids. Terrestrial orchids are more dominantly found on hiking trails because the hiking trails have closed vegetation and denser canopy. So that terrestrial orchids are easier to find in a dense canopy, this is because serial orchids grow better in a humid place than in an open place. However, in the Curug Ciberum path, epiphyte orchids are more common in terrestrial orchids, this is because, the Curug Ciberum path has open vegetation and dense canopy so that epiphyte orchids are often found. because epiphyte orchids require more sunlight to grow. from this study also found the same species as the research that the researchers found, namely the *Eria iridifolia species, Bulbophyllum* sp. and some of the same genera, namely the genus Cymbidium, the genus Coelogyne, the genus Agrosthopyllum, the genus Dendrobium and Phaius. This is because the condition of the vegetation where the researchers did is not much different, and also this type of orchid is easy to adapt to the environment and is easily found in similar places.

The community forest area in Jorong Harapan Tinggam has many trees that are old so they are suitable for epiphyte plants, one of which is orchids. Because the community forest is overgrown by annual plants such as durian, rambutan, areca nut, mahogany, surian and other tree plants. The availability of host trees is one of the basic needs for epiphyte orchids to grow and develop. so that the plant is very suitable for epiphyte orchid habitat. In addition, the community forest area in Jorong Harapan Tinggam has a loose canopy and open vegetation so that it gets direct sunlight. Not only for epiphyte orchids, terrestrial orchids can also grow and be found. Based on the results of community observations in Jorong Harapan Tinggam, many do not know about natural orchids. People there only know about orchids that they have heard of, such as moon orchids. Based on the description of the problem above, the purpose of this research is to inventory orchids in Jorong Harapan, Tinggam Community Forest Talamau Pasaman Barat District West Sumatera.

METHOD

The research was conducted in the community forest area of Jorong Harapan, Talamau District, West Pasaman Regency in September-October 2021. The tools used in this research were identification books, stationery, mobile phones, newsprint, crop scissors, rafi rope knives, and other materials used 70% alcohol and plant samples. The method used in this study is a survey descriptive method using a cruising technique. Cruising is the process of measuring forest stands to determine stand characteristics, such as average tree sizes, volume, and quality. The primary purpose of cruising is to obtain a volume estimation to appraise and prepare timber sales. Sampling was carried out by walking along the edge of the forest to the community forest and recording directly in the field. For those that can not be identified, it will continue in laboratorium. Sampling locations can be seen in Figure 1.

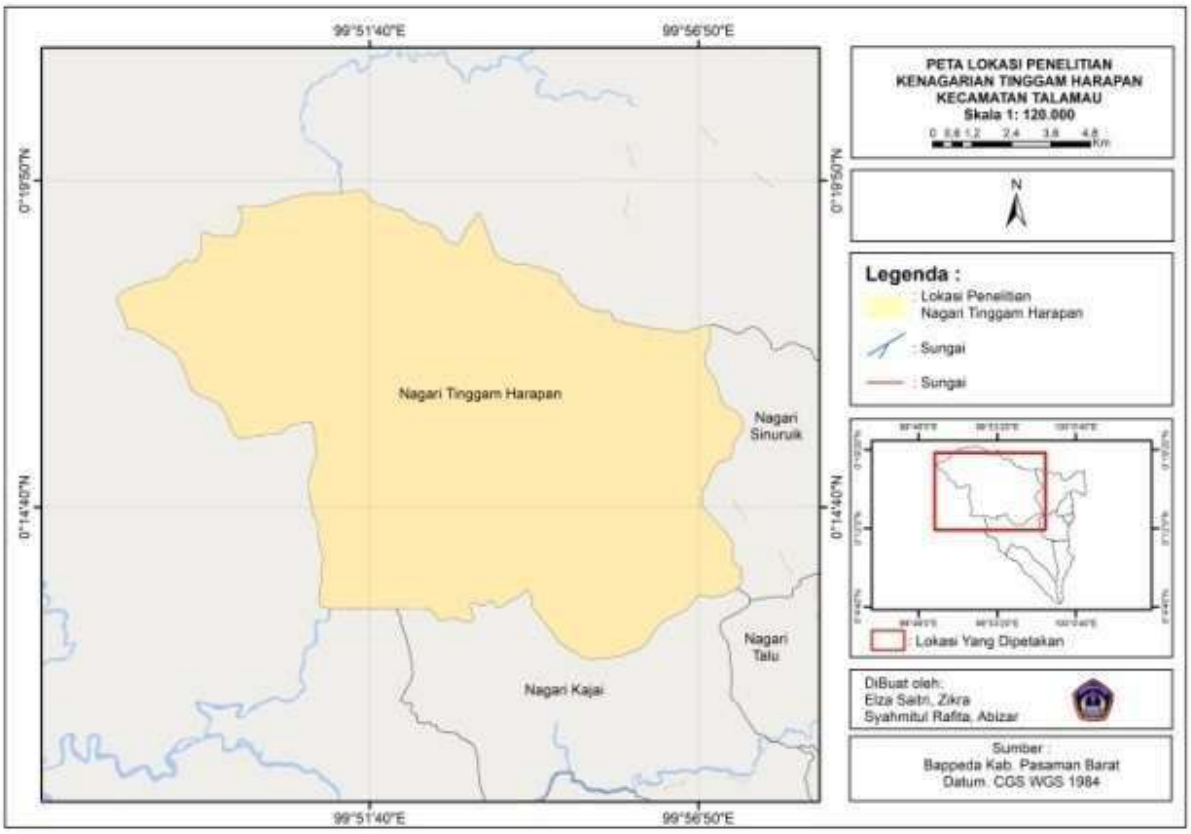

Figure 1 Location of exploration

The orchidacea is unique in its morphology (form or structure). Orchids have some morphological (physical) traits that make them stand out from other plant families. In orchids, many of their floral parts come in groups of three. In orchids the reproductive organ, known as the column, combines both the male and female parts in one structure. The leaves of many orchids in cultivation are also unique. They have a heavy waxy leaf coating and specialized stomata. Orchid stems are also specialized into what are called pseudobulbs. These are basically expanded stems. The roots of epiphytic (tree-dwelling) orchids have a special outer layer of dead cells called velamen. Velamen is silver-white in color, but becomes transparent when wet, so that when the root is wet it turns green as you are able to see through to the inner structures of the root that contain chlorophyll.

The community forest in Jorong Harapan Tinggam is grown by many annual plants such as *Durio zibertinus, Nephelium lappacaeun, Areca catechu, Swietenia mahagoni. Toona sinensis* and other tree plants which are suitable for living places for epiphyte plants, one of which is orchids. In addition, the community forest area in Jorong Harapan Tinggam also has a tenuous canopy and open vegetation so that it gets direct sunlight and allows orchids to live around the forest. Data analysis was carried out qualitatively by describing the samples obtained in the field. Identification methods used were by literature review (Sweet, 1980; Comber, 1990; Seidenfaden & JJ, 1992; B & EF, 2000; Comber, 2001).

RESULT AND DISCUSSION

Based on the results of the research conducted, 16 species of orchids from 12 genera with 13 species of epiphyte orchids were found (*Agrostophyllum lampongense* Blume. , *Bulbophyllum* sp., *Bulbophyllum angustifolium* Lindl., *Bulbophyllum plavescens* Blume., *Coelogyne rochussenii* De Vriese., *Cymbidium dayanum* Rchb.f., *Dendrobium crumenatum* Swartz., *Eria* sp., *Eria iridifolia* Hook.F., *Eria pilifera* Ridley., *Grammathophyllum speciosum* Blume., *Robiquatia spatulata* Blume., *Thelasis carinata* Blume. and 3 species of terrestrial orchids (*Arundina graminifolia* Hochr., *Phaius tankervilleae* Blume.,

Phaius tankervilleae Blume.) (Table 1)

Table 1. Types of Natural Orchids from Orchidaceae Family in the Community Forest of Jorong Harapan Tinggam, Talamau District, West Pasaman Regency West Sumatera

Ordo	Genus	Spesies	Evidence
Orchidales	1. Agrostophyllum	1. *Agrostophyllum lampongense* Blume.	*E*
	2. Arundina	2. *Arundina graminifolia* Hochr.	*T*
	3. Bulbophyllum	3. *Bulbophyllum* sp.	*E*
		4. *Bulbophyllum angustifolium* Lindl.	*E*
		5. *Bulbophyllum plavescens* Blume.	*E*
	4. Coelogyne	6. *Coelogyne rochussenii* De Vriese.	*E*
	5. Cymbidium	7. *Cymbidium dayanum* Rchb.f.	*E*
	6. Dendrobium	*8. Dendrobium crumenatum* Swartz.	*E*
	7. Eria	9. *Eria* sp.	*E*
		10. *Eria iridifolia* Hook.F	*E*
		11. Eria pilifera Ridley.	*E*
	8. Grammathophyllum	12. *Grammathophyllum speciosum* Blume.	*E*
	9. Phaius	*13. Phaius tankervilleae* Blume.	*T*
	10. Robiquatia	*14. Robiquatia spatulata* Blume	*E*
	11. Spathoglottis	*15. Spathoglottis plicata* Roxb.	*T*
	12. Thelasis	*16. Thelasis carinata* Blume.	*E*

Evidence, E is Epiphyte and T is Terresterial

Table 1 shows orchid species that are mostly found in the Community Forest of Jorong Harapan Tinggam, Talamau District, West Pasaman Regency are epiphyte orchid species consisting of 13 species, while the terrestrial orchids obtained are 3 species. This is because the research site that the researchers did in the Community Forest of Jorong Harapan Tinggam, Talamau District, West Pasaman Regency, has open vegetation and dense canopy so that the most commonly found orchids are epiphyte orchids, with the distance of the trees not being too close so that they are exposed to direct light making it suitable for the growth of epiphyte orchids. in addition to open vegetation, the presence of host trees also supports the growth of epiphyte orchids. The availability of host trees is one of the basic needs for epiphyte orchids to get a tendency that some types of orchids only have certain host trees as a place to grow (Sarinah, 2018; Mardiyana *et al*., 2019; Demena *et al.*, 2020).

In contrast to terrestrial orchids, terrestrial orchids prefer to live in humid places that are not exposed to sunlight direct. Epiphyte orchids that grow on trees have a thick and moist surface (Murtiningsih *et al*.,2016; Figianti & Soetopo, 2019; Demena *et al*., 2020). This orchid is attached to a stem that is plastered with moss, humus or weathered leaves. Common orchids live in trees whose trunk texture is uneven, rough and sometimes slightly cracked, this is quite reasonable because it makes it easier for the humus to stick and over time the humus accumulates so that the stem becomes moist (Sadili, 2013; Sarinah, 2018; Figianti & Soetopo, 2019). Epiphyte orchids generally stick to areas exposed to direct sunlight with temperature, humidity, and availability of nutrients that are in accordance with the orchid's physiology. Environmental factors are interconnected in optimal plant growth (Putra *et al*., 2016; Sarinah, 2018; Mardiyana *et al*., 2019).

Terrestrial orchids that live in soil are found in humid areas, there is a lot of litter with sufficient light intensity and shaded by large trees around it. Terrestrial orchids differ from epiphyte orchids based on their light requirements (Febriliani & Muslimin, 2013; Figianti & Soetopo, 2019; Demena *et al*., 2020). Therefore, orchids with high light requirements generally grow as epiphyte plants, while those that like shade will grow on the forest floor. The distribution of soil orchid species varies at each altitude interval. This is caused by climatic factors that support the growth of these orchids. The species found can be seen in figure 2.

Figure 2. (A) *Agrostophyllum lampongense* Blume., (B) *Arundina graminifolia* Hochr., (C) *Bulbophyllum* sp., (D) *Bulbophyllum angustifolium* Lindl., (E) *Bulbophyllum plavescens* Blume.,(F) *Coelogyne rochussenii* De Vriese.,(G) *Cymbidium dayanum* Rchb.f., (H) *Dendrobium crumenatum* Swartz., (I) *Eria* sp., (J) *Eria iridifolia* Hook.F., (K) *Eria pilifera* Ridley., *(L) Grammathophyllum speciosum* Blume., (M) *Phaius tankervilleae* Blume., (N) *Robiquatia spatulata* Blume., (O) *Spathoglottis plicata* Roxb., (P) *Thelasis carinata* Blume. (Source: personal documentation)

The following is a description of each orchid found in the community forest area of Jorong Harapan Tinggam, Talamau District, West Pasaman Regency. ***Agrostophyllum lampongense*** **Blume**, is an epiphyte orchid showing inflorescences like a ball consisting of many protective leaves , with small flowers. Sympodial growth type and clumps. The stem is covered by a leaf sheath. The leaves are arranged in two rows, while the inflorescences are at the end of the stem, hump-shaped, rounded, consisting of several flowers ((Majit *et al*., 2014; Pretidina dan Nengsih, 2019; Puspitaningtyas, 2020). ***Arundina graminifolia*** **Hochr.,** is a terrestrial orchid, has monopodial stems, round and straight stems with yellowish green color. Does not have pseudobulbs.Ribbon leaf shape, flat leaf edge, pointed leaf tip, alternate leaves sitting, leaf color is light green, yellowish to brownish, leaf surface is slightly slippery, leaf base is pointed. Terminal flowers, single inflorescence type, star flower shape, sepals and white petals, the lips of the flower are predominantly white and contain yellow (Sulistiarini & Tihurua, 2012; Marvianti *et al*., 2018; Nursanti *et al*., 2020).

Bulbophyllum sp. have that is to have a related rhizome, single leaf on each pseudo-tuber, and pseudo-tubers resembling bulbs in onions. The genus of *Coelogyne* has a distinctive characteristic, namely it has pseudo-bulbs, elongated and grooved, and has a pair of leaves that grow on each tuber and the leaves are wide and grooved (Yunaidi & Nurainas, 2004; Sulistiarini dan Tutie, 2017; Sudarso *et al*., 2020). ***Cymbidium dayanaum*** is an orchid that grows as an epiphyte. Has pseudo tubers hidden under the leaves. It has 7-9 leaves which are slightly stiff and slightly thick, long like a ribbon with a length of 50 cm and a width of 1.75 cm. Inflorescences emerge from the base of the tuber, hanging, 20 - 30 cm long, short stalk, one stalk consisting of 10 - 20 flowers with a distance of 2 - 3 cm. Flower stalk triangular, obtuse, 3 mm long. Flowers 3.6-4 cm wide, red petals and sepals (Djufri *et al*., 2017; Pretidina dan Nengsih, 2019; Garvita & Damhuri, 2022).

Dendrobium crumenatum **Swartz**. Epiphyte, sympodial and clumped way of life. Has a brownish stem and also has pseudo bulbs that are round, elongated and segmented. Segment length 1.5-3 cm. Stem length 18.45 cm. The leaves hug the stem, alternating parallel. With a length of 2-3 cm midrib. Leaves elongated slightly slanted. Inflorescence at the end of the stem, has white flowers, narrow triangular petals (Yunaidi & Nurainas, 2004; Andalasari & Nuraini, 2014; Djufri *et al*., 2017). ***Grammatophyllum speciosum*** **Blume**, is a large orchid. Grows in clumps, upright on each stem. The roots of this orchid are fibrous roots with brownish white color, the type of stem growth is green with black spots. Stem length ranges from 50-70 cm. Orchid leaves are in the form of gutter ribbons with lengths ranging from 39-60 cm. The average leaf width is 3 cm with a tapered shape and has a leaf bone (Bieth *et al*., 2020; Sulichantini *et al*., 2020; Eliyani *et al*., 2021).

Phaius tankervilleae **Blume.** Monopodial stems, round stems and covered with folded leaves. Leaf shape is lanceolate, leaf edge is flat, leaf tip is pointed, leaf color is shiny light green, leaf surface is rough, leaf base is rounded. Terminal flowers, flowering position on the pseudobulb side, type of bunch flowering, star flower shape, outer color of sepals and white petals, inner color of brownish purple (Vimal *et al*., 2018; Putra & Fitriani, 2019; Nursanti *et al*., 2020). ***Robiquatia spathulata*** **Blume**. has the characteristics of the stem has a hanging stem with a length of 30-50 cm. The leaves are 8-10 x 2.2-5 cm. The flowers are yellow and have brownish purple spots, which usually bloom in May- July. The *Robiquatia spathulata* orchid is a class of epiphyte orchids that can be found at an altitude of 190 meters above sea level (Albarkati *et al*., 2017; Heriansyah, Seprido, & Andriani, 2020; Prayoga *et al*., 2022). ***Spathoglottis plicata*** **Roxb** . Habitat is terrestrial. Pseudo-tuber, ovate, partially or completely in the soil, the number of leaves 3-7. Leaves: lanceolate-narrow to the base, pointed tip, erect and then curved, midrib and stem length 25-50 cm. Purple flowers (Saputra *et al*., 2018; Pretidina & Nengsih, 2019; Harijanto *et al*., 2022). ***Thelasis carinata*** has simpodial stems and green, layered stems that do not have pseudobulds. Ribbon-shaped leaves, as well as flat leaf edges and tapered leaf tips (Saputra *et al*., 2018; Nursanti *et al*., 2020; Rinaldi & Rita, 2020). This research finding will be more beneficial when being packaged in learning media (Aryati, 2021; Marhamah, 2021; Senjayani, 2021). Students will more excited reading and consuming knowledge by interesting media. In addition, learning media with case study will be more challenging. Besides the distribution pattern, biosystematics, ecology, we should more explore about

orchid bioprospecting. Like checking the phytochemical substances, then it will be clearer for beneficial application (Pertiwi & Saputri, 2020; Saputri & Pertiwi, 2021).

CONCLUSION

There were 16 species of that can be identified in community forest of Jorong Tinggam Talamau District Pasaman Barat West Sumatera. They are 13 species of epiphyte orchids (*Agrostophyllum lampongense* Blume *Bulbophyllum* sp., *Bulbophyllum angustifolium* Lindl., *Bulbophyllum plavescens* Blume., *Coelogyne rochussenii* De Vriese., *Cymbidium dayanum* , Rchb.f. *Dendrobium crumenatum* Swartz., *Eria* sp., *Eria iridifolia* Hook.F., *Eria pilifera* Ridley., *Grammathophyllum speciosum* Blume., *Robiquatia spatulata* Blume., *Thelasis carinata* Blume.). Moreover, 3 species of terrestrial orchids are (*Arundina graminifolia* Hochr., *Phaius tankervilleae* Blume., and *Spathoglottis plicata* Roxb.,.). It indicates that community forest of Jorong Tinggam Talamau District Pasaman Barat West Sumatra has a good habitat for both orchids and orchids's host.

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