

INVENTARISATION OF ORCHID TYPES (Orchidaceae) IN WEST TOMOHON AREA

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Abstract

This study aims to inventory orchid species in the West Tomohon area using the accidental sampling method of exploration in a predetermined place. Orchids are a type of flowering plant that comes from the Orchidaceae family. Each type of orchid has its own characteristics. Tomohon City has abundant natural resources, including ornamental plants such as orchids. Data on orchid diversity in West Tomohon Sub-district has never been reported. Orchid inventory is an activity that records the diversity of orchid species in an area. This research is descriptive-qualitative research. The results of this study have yielded 10 species of orchids belonging to nine genera in one family. The orchid species found in the West Tomohon area consist of *Arachnis sp.*, *Arundina graminifolia*, *Cattleya sp.*, *Dendrobium biggibum*, *Dendrobium moschatum*, *Epidendrum secundum*, *Oncidium flexuosum*, *Phaius tankervilleae*, *Phalaenopsis amabilis*, and *Vanda arcuata*. The most common orchid found in this area is the moon orchid, *Phalaenopsis amabilis*.

Key words: Orchid, epiphyte, inventory, terrestrial

INTRODUCTION

This globe has a wide variety of plants, from low-level plants to high-level plants. Other living species, including people, depend on plants for a variety of reasons, including food, clothing, medicine, ornamental flora, and other uses. Because of its distinctive and alluring physical appearance, which can draw attention, the orchid is one of the decorative plants that the public finds to be very appealing and in high demand. The Orchidaceae family, which includes orchids, has been recognized for 200 years and has only just started to be widely farmed in Indonesia (Rangkuti, 2018).

Indonesia is the country with the second-largest wealth of orchid germplasm after Brazil, not only in terms of the number of genus but also in terms of species with varieties and types (Kusmana et al., 2015). Orchids are also one type of ornamental plant that is often a favorite for the community. This is due to the attractiveness of orchids, which comes from the variety of shapes and colors that become the uniqueness and characteristics of this plant (Widowati and Agustin, 2015). There are several types of orchids based on their place of growth, namely:

- 1) Epiphytic orchids require protection from sunlight and can grow on other trees without hurting the

host plant (Sutiyoso and Sarwono, 2005).

- 2) Terrestrial orchids are orchids that grow on the ground and require direct sunlight (Assagaf, 2012).
- 3) Saprophytic orchid is a type of orchid that grows on media that has a high humus content and requires little sunlight (Holttum, 1965).
- 4) Lithophytic orchids are orchids that grow on rocks or rocky soil and are resistant to full sunlight. (Yusnita, 2012).

According to (Jatmika, 2013), orchid plants serve a variety of purposes, including serving as ornamental plants so that we can appreciate the beauty of their flowers. Orchid plants are also used as one of the product's raw components in several health and cosmetic products.

Referring to the book *Orchid Species of Indonesia*, published by the Directorate of Horticultural Seedlings of the Ministry of Agriculture of the Republic of Indonesia (Adisarwanto, 2012), it states that approximately 750 families, 43000 species, and 35000 hybrid varieties of orchids have been discovered so far from all over the world. There are 5,000 of these that are recognized as being indigenous to Indonesia alone, including both wild varieties and cultivated varieties. Tomohon City is home to one of them.

Tomohon City is one of the cities in the province of North Sulawesi. Geographically, the city is located at the coordinates 01°15'15" north latitude and 124°49'20" east longitude and is located at an altitude of approximately 900–1100 meters above sea level (asl). It is flanked by two active volcanoes, namely Mount Lokon (1,580 m) and Mount Mahawu (1,311 m). This condition has resulted in Tomohon having abundant natural resources, including ornamental plants such as orchids. Tomohon City is widely known by the public as the City of Flowers and has implemented a program known as the Tomohon International Flower Festival (TIFF) since 2008 as a form of promotion of this city (Kowaas et al. 2017). It is necessary to conduct an inventory of the types of orchids found in the West Tomohon area, which is very necessary so that the preservation of orchids is maintained as well as the control of the relevant agencies.

Inventory is an activity that records the diversity of plant species in an area. (Puspitaningtyas, 2005) explains that inventory activities can be used to see the dominance of terrestrial orchid species in an area. (Fachrul, 2012) explains that the inventory of terrestrial vegetation aims to determine the composition of plant species. The aspects of vegetation that need to be known include the presence or absence of a species, frequency, density, dominance, and important value. In addition, related to observations on the community, there is a parameter, namely diversity (Fachrul, 2012). The purpose of the study was to inventory orchid species in the West Tomohon area.

RESEARCH METHODS

Place and Time of Research

The research was conducted in May–June 2022 and continued in February–March 2023. Research activities were carried out in West Tomohon Sub-district, Tomohon City, North Sulawesi.

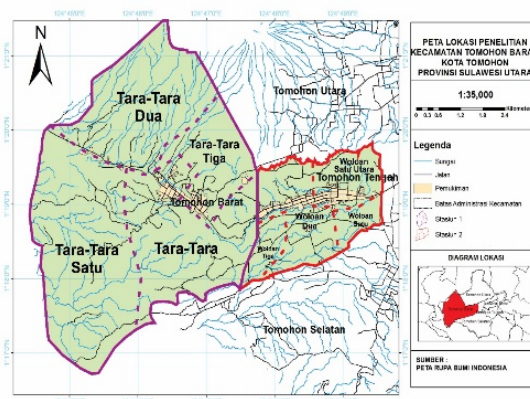


Figure 1. Map of Research Locations

Table 1. Tools and Materials

| No. | Tool Name | Function |
|-----|--|--|
| 1. | Writing Instruments | Used to record any data found during the research. |
| 2. | Tomohon City Map | Provide information on the relative location of the research area, especially Tomohon City, West Tomohon Sub-district. |
| 3. | GPS (GPS Map Camera: Geotag Photos Version 1.4.22) | To determine the coordinates of the position, altitude, and direction of the observation path. |
| 4. | Camera | To document orchid plants found during the study. |
| 5. | Anemometer | To measure wind speed. |
| 6. | Soil Meter | To measure pH, soil moisture, and light intensity |
| 7. | Hygrometer | To measure air humidity and air temperature. |
| 8. | Google Lens | is an image recognition technology developed by Google, which is designed to surface information related to an identified object using visual analysis based on neural networks. |
| 9. | Buku Tentang Anggrek | As a reference to explore and match information with the data found. |

The materials used in this study were orchids found in the West Tomohon area, Tomohon City

Research Procedure

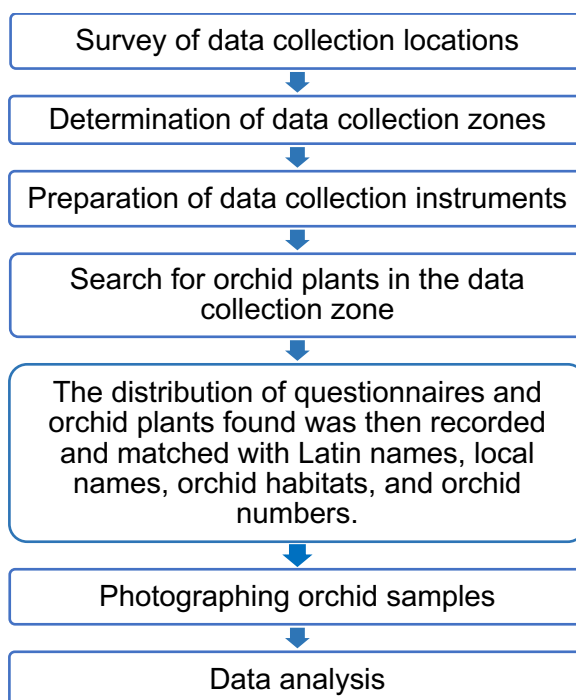


Figure 2: Research flow chart

Data Analysis

The orchid plants obtained were then identified. The identification results were then entered into the data tabulation as Table 3.3. Table 3.3 can be seen in appendix 4.

RESULTS AND DISCUSSION

Research Results

Overview of the Research Location

This study was conducted in West Tomohon Sub-district, Tomohon City, North Sulawesi with an area of 40.69 km² which is divided into 8 villages namely Woloan I, with an area of 107.28 ha, which is divided into eight neighborhoods; Woloan I North with an area of 159.3 ha, which is divided into six neighborhoods; Woloan II with an area of 650 ha, which is divided into eleven neighborhoods; Woloan III with an area of 140 ha, divided into ten neighborhoods; Tara-Tara with an area of 590 ha, divided into seven neighborhoods; Tara-Tara I with an area of 626.5 ha, divided into eight neighborhoods, Tara-Tara II with an area of 511.225 ha, divided into eight neighborhoods; and Tara-Tara III with an area of 722.21 ha, divided into seven neighborhoods. The research location in the form of 8 neighborhoods is then used as 2 research zones, namely station 1 Woloan and station 2 Tara-Tara.

Research Results

The results of the research conducted in the West Tomohon area of Tomohon City can be seen in Table 2. Based on Table 2, the orchid species found in the West Tomohon area consist of *Arachnis sp.*, *Arundina graminifolia*, *Cattleya sp.*, *Dendrobium bigibbum*, *Dendrobium moschatum*, *Epidendrum secundum*, *Oncidium flexuosum*, *Phaius tankervilleae*, *Phalaenopsis amabilis*, and *Vanda arcuata*.

Table 2. Orchid Species in West Tomohon Area

| Family | Genus | Species | Regional Name | Habitat | Total |
|-------------|---------------------|------------------------------|----------------------|-------------|-------|
| Orchidaceae | <i>Arundina</i> | <i>Arundina graminifolia</i> | Anggrek Bambu | Terrestrial | 20 |
| Orchidaceae | <i>Cattleya</i> | <i>Cattleya sp.</i> | Anggrek Cattleya | Epifit | 22 |
| Orchidaceae | <i>Coelogyne</i> | <i>Arachnis sp.</i> | Anggrek Kalajengking | Epifit | 25 |
| Orchidaceae | <i>Dendrobium</i> | <i>Dendrobium bigibbum</i> | Anggrek Larat | Epifit | 10 |
| Orchidaceae | <i>Dendrobium</i> | <i>Dendrobium moschatum</i> | Anggrek dendrobium | Terrestrial | 4 |
| Orchidaceae | <i>Epidendrum</i> | <i>Epidendrum secundum</i> | Anggrek Tanah | Terrestrial | 27 |
| Orchidaceae | <i>Oncidium</i> | <i>Oncidium flexuosum</i> | Anggrek dancing lady | Epifit | 4 |
| Orchidaceae | <i>Phaius</i> | <i>Phaius tankervilleae</i> | Anggrek Biarawati | Terrestrial | 11 |
| Orchidaceae | <i>Phalaenopsis</i> | <i>Phalaenopsis amabilis</i> | Anggrek Bulan | Epifit | 43 |
| Orchidaceae | <i>Vanda</i> | <i>Vanda arcuate</i> | Anggrek Vanda | Epifit | 6 |

Abiotic Factor

Table 3. Abiotic factor measurements

| Research Location | Parameter | | | | | | Types of Orchids | Number of Orchids |
|-------------------|------------------|------------------|------------------|-----------------------|---------|------------------|------------------------------|-------------------|
| | Temperature (°C) | Wind Speed (m/s) | Wind Speed (m/s) | Light Intensity (Lux) | Soil pH | Wind Speed (m/s) | | |
| Station 1 | 22,5-26,8 | 10 | 71,4-89,8 | 100-800 | 6 | 0,9-1,7 | <i>Arachnis sp.</i> | 14 |
| | | | | | | | <i>Arundina graminifolia</i> | 20 |
| | | | | | | | <i>Cattleya sp.</i> | 17 |
| | | | | | | | <i>Dendrobium bigibbum</i> | 6 |
| | | | | | | | <i>Dendrobium moschatum</i> | 4 |
| | | | | | | | <i>Epidendrum secundum</i> | 18 |
| | | | | | | | <i>Oncidium flexuosum</i> | 4 |
| | | | | | | | <i>Phaius tankervilleae</i> | 5 |
| | | | | | | | <i>Phalaenopsis amabilis</i> | 25 |
| | | | | | | | <i>Vanda arcuate</i> | 6 |
| Station 2 | 23,4-25,6 | 6-10 | 80,9-86,8 | 100-300 | 6-7 | 1,0-1,5 | <i>Arachnis sp.</i> | 11 |
| | | | | | | | <i>Cattleya sp.</i> | 5 |
| | | | | | | | <i>Dendrobium bigibbum</i> | 4 |
| | | | | | | | <i>Epidendrum secundum</i> | 9 |
| | | | | | | | <i>Phaius tankervilleae</i> | 6 |
| | | | | | | | <i>Phalaenopsis amabilis</i> | 18 |

The growth and development of orchid plants are also influenced by external and environmental factors, which include temperature, soil and air humidity, light intensity, soil pH, and wind speed.

Public Information on Orchids

The process of orchid inventory in West Tomohon was conducted using questionnaires in the stage of collecting information from the community to complete the research data. From the interview

process using this questionnaire, the results are in the form of data on the origin of seedlings

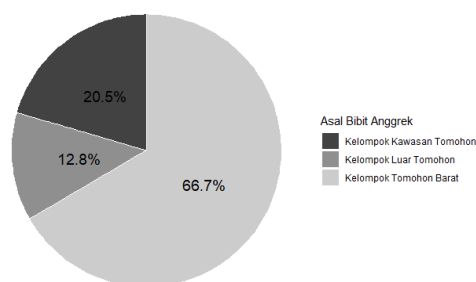


Figure 3. Orchid Seedling Origin Diagram

The orchids that live in the West Tomohon area come from different places. There are orchid seeds that have grown or indeed come from the forest and garden areas of Woloan and Tara-Tara, which are still included in the West Tomohon District, so that they are grouped into 1 group for the West Tomohon Area group; there are seeds purchased at Tomohon market and from Kakaskasen Village, which is still in the Tomohon City area, so that they are grouped into 1 group for the Tomohon Area; and there are also orchid seeds brought from outside the Tomohon City area. Based on Fig. 3, about 66.7% of the total orchids found in West Tomohon came from the gardens of local residents, who then shared them with neighbors who also wanted to grow orchids. A total of 20.5% of orchid seeds were purchased from Tomohon market and Kakaskasen village, and the remaining 12.8% of orchid seeds came from outside Tomohon City. Based on interviews with respondents, 12.8% of orchid seeds that came from outside Tomohon came from Lemoh and Ranotongkor gardens, Sanger, Kalimantan Island, and the Buroko area.

The types of orchids that are known to come from the West Tomohon area or whose seeds are taken from forests and gardens and then planted in the yard are *Phalaenopsis amabilis*, or moon orchid, and *Arachnis* sp., or scorpion orchid. Meanwhile, orchids from outside Tomohon also vary, including *Oncidium flexuosum* species brought from Kalimantan and *Dendrobium bigibbum*, or Larat orchid, whose seeds were brought from the Buroko area. These orchids adapted to the environmental conditions in the West Tomohon area and grew and developed for many years in this environment. The following is a diagram of the length of time the people of West Tomohon have been keeping orchids based on the results of the questionnaire data that has been distributed.

Based on Figure 3, it is known that there are 3 groupings of the time span of the community in maintaining orchids. Group A is a group of people who have kept orchids for about 1 to 5 years, group B is a group of people who have kept orchids for 6-10 years, and group C is a group of people who have kept orchids for more than 10 years. According to information from people who have kept orchids for many years, orchids can live a long time by regenerating buds that make orchids become lush and dense so that they do not die easily.

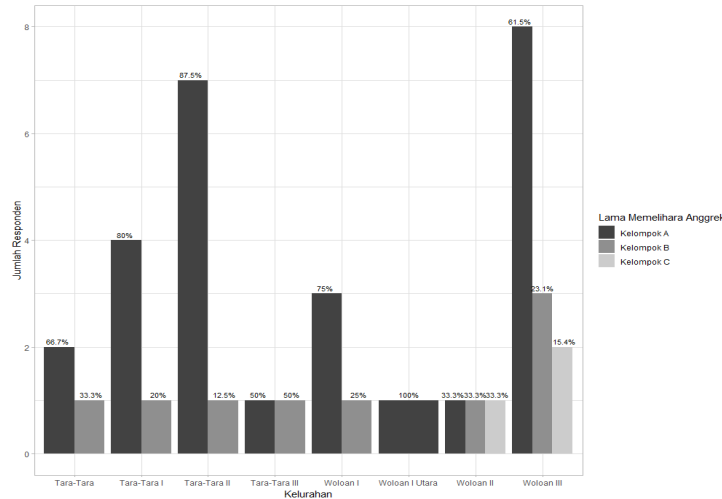


Figure 4. Orchid Maintenance Time Range

Description:

Group A: 1-5 years old.

Group B: 6-10 years.

Group C : above 10 years

People who are included in group C, or the group of people who keep orchids for more than 10 years, some have kept orchids for 15 years, and even the longest is for 30 years. The types of orchids that live for dozens or even decades are known to be *Arachnis* sp., or Scorpion Orchid, and *Epidendrum secundum*, or Ground Orchid; both types of orchids are terrestrial orchids that grow on the ground, usually planted in the yard of the house that is exposed to direct sunlight.

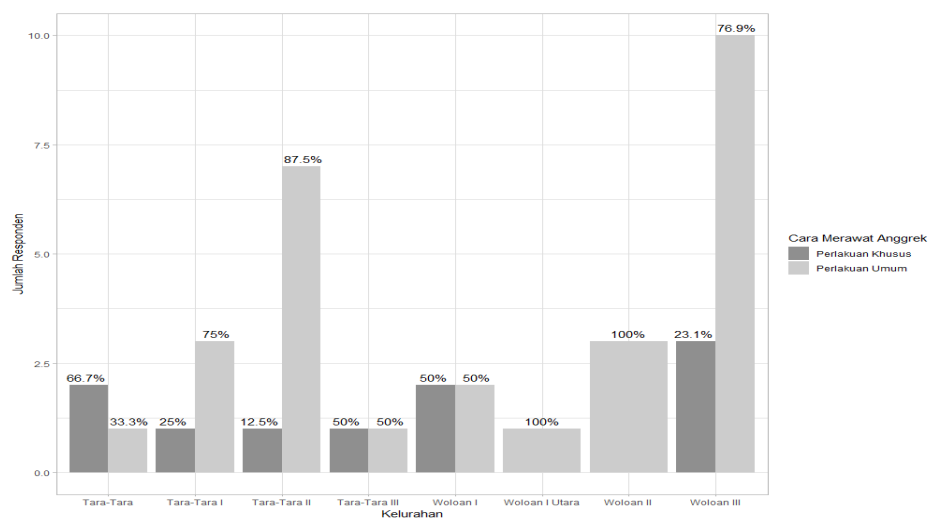


Figure 5. How to care for orchids

Care and patience are needed in caring for orchid plants because, depending on the type, they have different abiotic needs. There are orchids that cannot be exposed to direct sunlight, and there are orchids whose stems will rot if they receive too much water. According to the interviews, there are various ways

that the people of West Tomohon take care of their orchids. Some take care of their orchids with general treatment by routinely watering and cleaning them, and some go as far as doing special treatments that are believed to make their orchids grow better.

Discussion

Types of Orchids in West Tomohon Area

The results of research conducted in the West Tomohon area have obtained 10 species of orchids belonging to 9 genus from 1 family. The orchid species found in West Tomohon consist of *Arachnis sp.*, *Arundina graminifolia*, *Cattleya sp.*, *Dendrobium bigibbum*, *Dendrobium moschatum*, *Epidendrum secundum*, *Oncidium flexuosum*, *Phaius tankervilleae*, *Phalaenopsis amabilis*, and *Vanda arcuata*.

In Table 1, it can be seen that the number of *Phalaenopsis amabilis* orchids in West Tomohon reached 43 individuals, which means that this type of orchid, often called the Moon Orchid, is the most dominant orchid species in West Tomohon. According to the book "1001 Orchid Species" (Assagaf, 2012), *Phalaenopsis amabilis* needs a place to grow with moderate to warm temperatures, high humidity, and more than 50% shade. This is evident from the research carried out looking at environmental abiotic factors at Stations 1 and 2, where the minimum ambient temperature is 22.5°C and the maximum temperature is 26.8°C, because in general orchids need a minimum temperature of around 15 °C and a maximum temperature of 28°C to grow well (Dewi, 2021). *Phalaenopsis amabilis* is an epiphytic plant that usually lives in the lowlands up to 1,500 m above sea level, while the research location is located at an altitude of 537–764 m above sea level, making it an ideal place for the growth of Moon Orchid.

Based on data obtained directly from research at the location, orchids found in the West Tomohon area are epiphytic orchids and some terrestrial orchids. Epiphytic orchids are types of orchids that live attached to other plants; in this case, the types of epiphytic orchids found in West Tomohon are *Cattleya sp.*, *Arachnis sp.*, *Dendrobium bigibbum*, *Phalaenopsis amabilis*, and *Vanda arcuate*. While the rest are terrestrial orchids, this type of orchid grows on the ground and requires direct sunlight, terrestrial orchid species found in this area are *Arundina graminifolia*, *Dendrobium moschatum*, *Epidendrum secundum*, and *Phaius tankervilleae*.

Based on the data obtained during the research, there are orchid species that come from outside the West Tomohon area; these orchids are deliberately brought from outside the area to be maintained in this area by the community. The type of orchid, *Oncidium flexuosum*, is an orchid brought from the island of Borneo. This orchid then adjusts to the environmental habitat in Woloan I. How to care for this orchid is by routinely clipping so that the growth of buds is good, not leaving them in direct sunlight, and being often talked to when being treated, for example when watering or cleaning from plant pests. With such care, it is proven that this orchid is thriving and has lived for about 2 years.

Dendrobium biggibum, also known as Larat orchid, is also the second type of orchid that comes from outside the research area. This orchid seed was brought from the Buroko area as a gift from a relative and was then planted in the Tara-Tara area. This orchid is treated by watering with rice water soaked for

3 days and cleaned from flower bugs every afternoon. The result is that this orchid thrives even though it grows outside its area of origin.

Other orchid species brought from outside the West Tomohon area are the Moon Orchid, or *Phalaenopsis amabilis*, from Ranotongkor Garden, which was brought to Woloan but can still grow well in that environment; the *Dendrobium moschatum* species brought from Lemoh, which was also brought to Woloan III and has adapted to the environment; and finally, the *Epidendrum secundum*, or Earth Orchid, species brought from Sanger to Tara-Tara II and has adapted to that habitat. These orchids can live and grow well because they managed to adjust to the new environment, assisted by good care from the orchid owner, so they can live for years.

CONCLUSION

Based on the results of the study, it can be concluded that there are 10 species of orchids found in the West Tomohon area, which can be grouped into 9 genera from 1 family, namely Orchidaceae. The species found are *Arachnis sp.*, *Arundina graminifolia*, *Cattleya sp.*, *Dendrobium bigibbum*, *Dendrobium moschatum*, *Epidendrum secundum*, *Oncidium flexuosum*, *Phaius tankervilleae*, *Phalaenopsis amabilis*, and *Vanda arcuata*. The most common orchid in this area is the moon orchid, *Phalaenopsis amabilis*.

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