

Inventory of the family Orchidaceae in *Desa Serdang* village forest, Barusjahe, Karo, North Sumatra

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ABSTRAK

Hutan desa *Desa Serdang*, Barusjahe, Karo, Sumatera Utara adalah hutan desa yang pengelolaannya dilakukan secara mandiri oleh masyarakat. Ternyata hutan tersebut memiliki kekayaan jenis yang tinggi layaknya hutan hujan tropis yang dikonservasi dan dikelola negara. Kelompok anggrek adalah kelompok yang penting diketahui keragamannya di satu kawasan, karena umumnya menggambarkan kualitas hutan dengan tingkat keragaman hayati yang baik. Penelitian ini menggunakan metode eksplorasi mengungkap 32 jenis anggrek yang terdiri dari 16 jenis anggrek terestrial yang berasal dari 13 marga dan 16 jenis anggrek epifit yang berasal dari 11 marga. Deskripsi dan kunci identifikasi tiap jenis disediakan dalam makalah ini.

Kata kunci: *Hutan Desa Serdang, Orchidaceae*

ABSTRACT

The village forest of *Desa Serdang*, Barusjahe, Karo, North Sumatra, is a community-managed forest. This forest exhibits a high species richness comparable to state-conserved and managed tropical rainforests. The orchid group is particularly important to assess in any area, as it generally indicates forest quality with good biodiversity levels. This study employs an exploratory method to reveal 32 orchid species, consisting of 16 terrestrial orchid species from 13 genera and 16 epiphytic orchid species from 11 genera. Descriptions and identification keys for each species are provided in this paper.

Keywords: *Serdang Village Forest, Orchidaceae*

INTRODUCTION

Sumatra is a region with the high endemicity and relative species richness of plants (Nahib & Suwarno, 2017). In North Sumatra, Serdang Village in Karo Regency is a region that directly borders the forest, making it an important location for flora exploration. The forest of *Desa Serdang* is part of the Tongkoh Grand Forest Park at an altitude of 1300 – 1500 meters above sea level. This forest is not managed nationally as a conservation reserve and maintained locally by the local community. However, this forest is rich in biodiversity and worth exploring in understanding the biodiversity compared to state managed forest.

This forest is dominated by trees with diameters exceeding 20 cm but has limited understory plants due to the thick litter and wide tree canopies. The forest in Serdang

Village boasts diverse vegetation, which is why some locals utilize forest resources. To improve harvests and develop agriculture, villagers have begun converting forest areas into agricultural land, threatening the forest's vegetation diversity with extinction. Based on initial observations in the area, the Orchidaceae family was found consisting of 6 genera including *Spathoglottis*, *Bulbophyllum*, *Liparis*, *Eria*, *Adenoccos*, and *Dendrobium*. This indicates great potential for the discovery of other species of orchids.

Orchidaceae is one of the plant families with a high species diversity, leading to various genetic differentiation patterns among populations (Manik et al., 2017). Orchids are ornamental plants prized for their high aesthetic value. Their beautiful flowers have earned orchids the title "Queen of Flowers" (Kasutjianingrat & Irawan, 2013).

Orchids in the wild are dependent on forest integrity as their habitat. However, the increasing conversion of forest land into agricultural and plantation land threatens orchid habitats and has a negative impact on the survival of orchids in the forest. *The World Conservation Monitoring Center* (WCMC) states that orchids are among the most endangered plants in Indonesia, so it is possible that many orchid species have gone extinct before being described and documented (Hilmiah et al., 2017). Therefore, orchids need to be characterized based on their morphological structure and habitat (Darmono, 2004).

From a potential perspective, orchids are highly attractive to botanists for exploration and research. They are also appealing to ornamental plant collectors for economic and hobby purposes, often without any accompanying cultivation activities. As a result, wild orchids deserve protection (Purnamasari et al., 2016). This study aims to identify the species of plants from the Orchidaceae family, which can be used as a reference for conservation efforts and as a source of information regarding the identification of orchids in North Sumatra.

METHODOLOGY

Studies sites and species sampling

This research was conducted in the forest of *Desa* Serdang, Barusjahe, Karo, North Sumatra from May to July 2024. The samples used were terrestrial and epiphytic orchids found in the forest of *Desa* Serdang (**Figure 1**).

Research design

This research was conducted using a descriptive exploratory method. Exploration was carried out along three different routes heading east from the initial entry point into the forest, ensuring that the data collected sufficiently represents the overall population of plants from the Orchidaceae family in the *Desa* Serdang forest area. Marking of the path and coordinate points where plants from the Orchidaceae family were found at the observation location was carried out using GPS. Each sample found was recorded, observed and used as herbarium.

Research procedures

The research procedure involved three main stages: First, the Preparation Stage, which included observing the research location, reviewing literature on the Orchidaceae

family, and preparing the necessary tools and materials. Second, during the Data Collection Stage, data was gathered through exploration by surveying the area along predetermined routes, observing and documenting Orchidaceae plants. Finally, in the Herbarium Preparation Stage, the collected Orchidaceae plants were preserved by creating a dry herbarium, which encompassed specimen collection, preservation, and mounting.

Data analysis techniques

Data analysis was performed descriptively and qualitatively, utilizing various parameters, including the morphological characteristics of roots, stems, leaves, flowers, and fruits, which were compared with identification books and botanical literature.



FIGURE 1. Research Location

RESULTS AND DISCUSSION

We found 32 orchid species in the forest of Serdang Village, consisting of 16 terrestrial orchid species from 13 genera (**Figure 2**) and 16 epiphytic orchid species from 11 genera (**Table 1**). Our finding on the number of species is relatively high compared to other similar forests in Sumatra. For example, in the Eastern Education Forest of Bukit Barisan Tongkoh Forest Park, Karo Regency, only 13 terrestrial orchid species from 8 genera have been recorded (Pasaribu et al., 2013). This difference is since their research focused solely on terrestrial orchids, whereas our study covers both terrestrial and epiphytic.

Terrestrial orchid genera most represented in *Desa Serdang* are *Liparis* (3 sp.) and *Spathoglottis* (2 sp), while epiphytic genera are *Ceratostylis* (4 sp.) and *Dendrobium* (2 sp.) (**Table 1**). If we compare this with global diversity, *Liparis* is a genus with about 250—300 sp while *Spathoglottis* is about 50 species, *Ceratostylis* about 60—140 species, and *Dendrobium* about 1400 species (Hassler, 2025). This means that *Dendrobium* may be underrepresented in *Desa Serdang*. As *Dendrobium* mainly consists of epiphytic species, it is probable that *Desa Serdang* Village Forest may be deficient in large suitable host trees. As *Desa Serdang* Village Forest is managed by the local community, a large portion of the large natural stands may have been converted into economically valuable

stands such as *Styrax*. Conversely, *Spathoglottis* is better represented in *Desa* Serdang. This may be due to edaphic suitability or sunlight exposure of *Desa* Serdang for *Spathoglottis* species. *Spathoglottis* is known to thrive under a high light environment, as commonly found on roadsides, logging areas, or village gardens. These light abundant places are common in the vicinity of *Desa* Serdang, and may be exploited by sun-loving orchid species. Further investigation about the edaphic suitability of *Desa* Serdang environment to terrestrial orchids is recommended.

TABLE 1. Species of Orchids Found in the Forest of Serdang Village

NO	SUBSTRATE	SPECIES	ALTITUDE (M)
1	Terrestrial	<i>Acanthephippium striatum</i> Lindl	1,370
2		<i>Anoectochilus longicalcaratus</i> J.J.Sm.	1,374
3		<i>Apostasia wallichii</i> R.Br.	1,380
4		<i>Arundina graminifolia</i> (D.Don) Hochr.	1,316
5		<i>Cryptostylis arachnites</i> (Blume) Hassk.	1,371
6		<i>Dendrobium batakense</i> J.J.Sm.	1,393
7		<i>Goodyera pusilla</i> Blume	1,341
8		<i>Liparis latifolia</i> Lindl	1,395
9		<i>Liparis rheedei</i> Lindl	1,371
10		<i>Liparis terrestris</i> J.B.Comber	1,353
11		<i>Neuwiedia zollingeri</i> Rchb.f.	1,371
12		<i>Phaius corymbioides</i> Schltr.	1,382
13		<i>Polystachya concreta</i> (Jacq.) Garay & H.R.Sweet	1,395
14		<i>Spathoglottis aurea</i> Lindl	1,316
15		<i>Spathoglottis plicata</i> Blume	1,316
16		<i>Tainia wrayana</i> J.J.Sm.	1,377
17	Epiphyte	<i>Acriopsis liliifolia</i> (J. Koenig) Ormerod	1,373
18		<i>Adenoncos Sumatrana</i> J.J.Sm.	1,353
19		<i>Agrostophyllum majus</i> Hook.f.	1,393
20		<i>Ascidieria longifolia</i> (Hook.f.) Seidenf.	1,400
21		<i>Bulbophyllum lobbii</i> Lindl	1,353
22		<i>Bulbophyllum violaceum</i> Lindl	1,374
23		<i>Ceratostylis ampullacea</i> Kraenzl.	1,353
24		<i>Ceratostylis crassipetala</i> J.J.Sm.	1,374
25		<i>Ceratostylis leucantha</i> Schltr.	1,373
26		<i>Ceratostylis radiata</i> J.J.Sm.	1,370
27		<i>Coelogyne cuprea</i> H.Wendl. & Kraenzl.	1,373
28		<i>Dendrobium capitellatoides</i> J.J.Sm.	1,316
29		<i>Dendrobium rhombeum</i> Lindl	1,353
30		<i>Eria pachystachya</i> Lindl	1,366
31		<i>Pteroceras teysmannii</i> (Miq.) Holtum	1,373
32		<i>Stichorkis confusa</i> (J.J.Sm) V. Agustin	1,316

As the altitudinal distribution of orchid in *Desa* Serdang is limited to the altitude of 1,316—1,400 m (**Table 1**), it is difficult to clearly differentiate the altitudinal suitability of orchid flora. However, species in lower altitude (1,316 m) are *Arundina graminifolia*

Spathoglottis aurea, *Spathoglottis plicata*, *Dendrobium capitellatoides* and *Stichorkis confusa*. *A. graminifolia*, *S. aurea*, *S. plicata* are terrestrial, while *D. capitellatoides* and *S. confusa* are epiphytic. The higher altitude species are *Liparis latifolia* and *Polystachya concreta* (1,395 m), and *Ascidieria longifolia* (1,400 m). While *L. latifolia* and *P. concreta* are terrestrials, *A. longifolia* is epiphytic. This data reveals that there is probably no tendency of altitudinal distribution on epiphytic and terrestrial orchids, as we found both epiphytic and terrestrial in lower and higher altitude.

We provide identification keys for orchid species found in the *Desa* Serdang Village Forest, Barusjahe. Karo, Nort Sumatra, as follows.

A. Identification Key for Terrestrial Orchids

1. a) stem with pseudobulbs 2
b) stem without pseudobulbs 3
2. a) pseudobulb large, rounded, short..... *Liparis terrestris* J.B.Comber
b) pseudobulb small, rounded, long 4
3. a) stem erect..... 5
b) stem prostrating..... *Tainia wrayana* J.J.Sm.
4. a) stem sympodial 6
b) stem monopodial 8
5. a) stem surface pubescent..... *Anoectochilus longicalcaratus* J.J.Sm.
b) stem surface glabrous 9
6. a) stem is watery 7
b) stem is stiff and dry 13
7. a) stem greenish-white..... *Liparis latifolia* Lindl
b) stem green 10
8. a) leaf shape oblong..... *Acanthephippium striatum* Lindl
b) leaf shape lanceolate *Phaius corymbioides* Schltr.
9. a) leaf surface laevigate 11
b) leaf surface with prominent white veins *Goodyera pusilla* Blume
10. a) leaf tip acute *Liparis rheedei* Lindl
b) leaf tip obtuse *Polystachya concreta* (Jacq.) Garay & H.R.Sweet
11. a) leaf arrangement alternate or opposite 12
b) leaf arranged in a basal rosette 14
12. a) leaves opposite, decussate along the stem..... *Apostasia wallichii* R.Br.
b) leaves alternate 15
13. a) tepal yellow *Spathoglottis aurea* Lindl
b) tepal purple..... *Spathoglottis plicata* Blume
14. a) tepal yellow, outer surface hairy..... *Neuwiedia zollingeri* Rchb.f.
b) tepal brownish-green, outer surface glabrous
..... *Cryptostylis arachnites* (Blume) Hassk.
15. a) single flower, tepal white, lip reddish-purple *Dendrobium batakense* J.J.Sm.
b) flower in inflorescence, tepal white, lip base yellow, apically purple
..... *Arundina graminifolia* (D.Don) Hochr.

B. Identification Key for Epiphytic Orchids

1. a) stem with pseudobulbs 2
b) stem without pseudobulbs 3
2. a) aerial root include hanging root..... 4
b) aerial root only *Acriopsis liliifolia* (J. Koenig) Ormerod
3. a) stem sympodial..... 6
b) stem monopodial *Pteroceras teysmannii* (Miq.) Holttum
4. a) stem erect..... 5
b) stem prostrating..... *Bulbophyllum violaceum* Lindl
5. a) pseudobulb large, rounded, short..... 7
b) pseudobulb small, rounded, long 8
6. a) stem surface glabrous 9
b) stem surface covered with reticulate sheath..... 10
7. a) stem surface smooth 11
b) stem surface with white patches..... *Coelogyne cuprea* H.Wendl. & Kraenzl.
8. a) stem yellowish-green..... *Dendrobium rhombeum* Lindl
b) stem brownish-green *Eria pachystachya* Lindl
9. a) leaves soft, thin..... 12
b) leaves rigid, thick, fleshy 14
10. a) leaf apex acute 13
b) leaf apex obtuse..... *Ceratostylis radiata* J.J.Sm.
11. a) one leaf per pseudobulb..... *Bulbophyllum lobbii* Lindl
b) two leaves per pseudobulb *Stichorkis confusa* (J.J.Sm) V. Agustin
12. a) leaves spirally arranged along the stem..... *Agrostophyllum majus* Hook.f.
b) leaves spirally arranged as apical whorl..... *Ascidieria longifolia* (Hook.f.) Seidenf.
13. a) leaf cylindrical 15
b) leaf lanceolate..... *Ceratostylis crassipetala* J.J.Sm.
14. a) leaf edges smooth, base tapering to attach to stem *Adenoncos Sumatrana* J.J.Sm.
b) leaf margin recurved, basally sessile..... *Dendrobium capitellatoides* J.J.Sm.
15. a) flower solitary, developing on each stem *Ceratostylis ampullacea* Kraenzl
b) flower in small clusters, emerging from multiple nodes on the stem *Ceratostylis leucantha* Schltr.

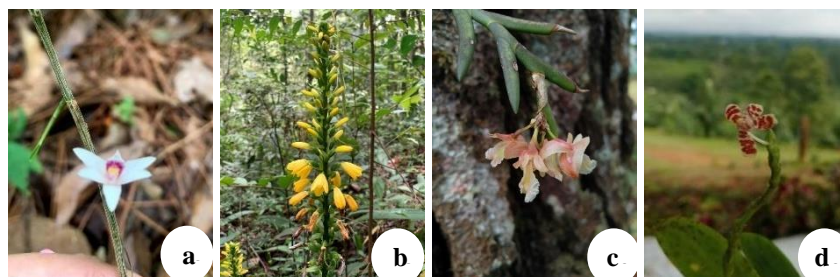


FIGURE 2. Terrestrial Orchids: a. *Dendrobium batakenense* J.J.Sm. b. *Neuwiedia zollingeri* Rchb.f. Epiphytic Orchids: c. *Dendrobium capitellatoides* J.J.Sm. d. *Pteroceras teysmannii* (Miq.) Holttum

Descriptions

Terrestrial species

1. *Acanthophippium striatum* Lindl

Acanthophippium striatum features round, soft green stem with pseudobulbs. The smooth, erect stem supports elongated leaves measuring 17-19.2 cm long and 5.3-7.1 cm wide, with pointed tips and bases, entire margin, and a glossy surface. The leaves are opposite each other at the stem's tip.

2. *Anoectochilus longicalcaratus* J.J.Sm.

A. longicalcaratus has round, moist stem covered in fine hairs, with a reddish-green colour and a basal rosette. It lacks pseudobulbs and features cordate leaf measuring 1.5-2.8 cm long and 1-2.2 cm wide. The leaf is also reddish-green, with blunt tips, a rounded base, undulated margin, and fine hairs on both surfaces. Its veins are golden, and the venation pattern is pinnate.

3. *Apostasia wallichii* R.Br.

Apostasia wallichii has slender, round stem with a smooth surface that is green in colour and does not have pseudobulbs. The stem grows erect and has a diameter of 0.3 cm. It has lanceolate leaf measuring 11-28 cm in length and 0.7-0.9 cm in width. The leaf tips are pointed, margin entire, and the base tapers to partially wrap around the stem. The leaf surface is smooth and shiny, green in colour, and the leaves are arranged alternately and spirally along the stem. The leaf venation pattern is parallel.

4. *Arundina graminifolia* (D.Don) Hochr.

Arundina graminifolia commonly known as bamboo orchid (Kaur et al., 2022), features cylindrical green stem resembling bamboo, with a smooth surface and no pseudobulbs. The erect, rigid stem supports lanceolate leaf, measuring 5.5–11.9 cm long and 0.5–0.6 cm wide, with pointed tips and bases, entire margin, and a smooth, shiny surface. The leaves are arranged alternately along the stem. The inflorescence is a raceme, about 2.2 cm long, comprising three sepals, three petals, and a slightly larger labellum. The flowers are white with a yellow base and purplish tips on the labellum.

5. *Cryptostylis arachnites* (Blume) Hassk.

Cryptostylis arachnites features a thick, fleshy rhizome with a slender, erect stem that is greenish-red and lacks pseudobulbs. It has an elongated leaf measuring 5–8.5 cm long and 2.2–3.1 cm wide, with pointed tips and bases, entire margin, and a smooth dark green surface. The leaf grows from the base of the stem or rhizome. The inflorescence is a raceme, approximately 24.2 cm long, with flowers measuring 1.2–1.5 cm. The flowers have small, slightly curved brownish-green sepals and petals, while the labellum is larger with a pattern of red spots.

6. *Dendrobium batakense* J.J.Sm.

Dendrobium batakense *Dendrobium batakense* features a slender, rounded brownish-green stem that grows erect with branches and smooth surfaces, lacking pseudobulbs. The nodes are spaced about 3.2 cm apart. It has lanceolate leaf measuring 0.9–5.5 cm long and 0.1–0.8 cm wide, with pointed tips, a blunt base, and dark green glossy surfaces. The leaves are arranged alternately, and the venation is parallel. The small flowers, approximately 2.5 cm long, have a short stalk and bilateral symmetry, featuring a funnel-shaped labellum, oval sepals, and slightly spread petals, with white colouring and a reddish-purple labellum.

7. *Goodyera pusilla* Blume

Goodyera pusilla has a short rhizome and an erect, rounded stem that is moist, smooth, and pale green. It lacks pseudobulbs on the basal rosette. The plant has elongated leaf measuring 1.5–2.2 cm long and 0.5–1.2 cm wide, with pointed tips, a rounded base, and a smooth, glossy surface. The dark green leaf margin is entire, and the palmate venation pattern includes striking white veins arranged in a circular formation at the tip of the stem.

8. *Liparis latifolia* Lindl

Liparis latifolia has a rounded, fleshy stem that is moist and pale green, with pseudobulbs and a smooth surface. The erect stem exhibits sympodial branching and supports lanceolate leaf measuring 25–26.1 cm long and 5–6.4 cm wide, characterized by a blunt tip, tapering base, entire margin, and a glossy dark green surface. The dry, capsule-shaped fruit is light brown, approximately 4 cm long and 1.3 cm wide.

9. *Liparis rheedei* Lindl

Liparis rheedei has a rounded, fleshy green stem with pseudobulbs and a smooth surface covered by leaf sheaths. The stem grows erect with a sympodial branching pattern. It features rhomboid leaf, measuring 2.3–8.1 cm long and 1.4–3.7 cm wide, with a pointed tip, blunt base, undulating margin, and glossy green surfaces. The leaves have parallel venation and are arranged alternately at the top of the stem. The inflorescence is a 17.3 cm long raceme, greenish-purple in color, with flowers on distinct 1–1.5 cm stalks. The bilaterally symmetrical flowers, measuring 1.2–1.5 cm, consist of two larger lateral sepals, two narrow petals, and a larger vividly coloured labellum.

10. *Liparis terrestris* J.B.Comber

Liparis terrestris has a short, rounded, fleshy light green stem with pseudobulbs approximately 0.8 cm in diameter. It grows erect in a sympodial pattern and features lanceolate leaf measuring 10.3–14.8 cm long and 0.8–2.3 cm wide, with a pointed tip, tapering base, and smooth glossy surfaces. The leaves are dark green, arranged oppositely at the top of the stem, with parallel venation.

11. *Neuwiedia zollingeri* Rchb.f.

Neuwiedia zollingeri features a slender, robust, rounded green stem without pseudobulbs, covered by leaf sheaths and growing erect with a monopodial branching pattern. It has lanceolate leaf measuring 16.2–50.3 cm long and 2.2–5.5 cm wide, with pointed tips, entire margin, and smooth dark green surfaces, arranged circularly at the stem's base. The inflorescence is a raceme with a stalk about 24 cm long, and each flower has a distinct stalk of approximately 1.3 cm. The radially symmetrical flowers resemble lilies, measuring 1–1.8 cm in length, with three yellow sepals and three lanceolate petals, along with three stamens and one pistil in the column.

12. *Phaius corymbioides* Schltr.

Phaius corymbioides has elongated, rounded, slender stem that is moist and has a smooth surface. It features nodes, is green in colour, possesses pseudobulbs, and the stem grows erect. It has lanceolate leaf measuring 8.4–14.6 cm in length and 0.7–2.5 cm in width, with pointed tips, entire margin, a blunt base, and a smooth, glossy surface that is green in colour. The leaves are arranged along the stem, and the leaf venation pattern is parallel.

13. *Polystachya concreta* (Jacq.) Garay & H.R.Sweet

Polystachya concreta has a rounded, slender, fleshy green stem with small pseudobulbs, growing erect in a sympodial pattern and covered by leaf bases. It features lanceolate leaf measuring 7–19 cm long and 0.7–3 cm wide, with a blunt tip, tapering base, entire margin, and smooth glossy surfaces. The leaves are arranged oppositely at the top of each stem, displaying parallel venation. The inflorescence is a greenish-yellow raceme between two leaves, with a stalk approximately 19 cm long. The dry fruit is capsule-shaped, measuring about 2.3 cm long and 0.3 cm wide, with yellow coloration and a spacing of about 2.5 cm between fruits.

14. *Spathoglottis aurea* Lindl

S. aurea features a slender, sturdy green stem with oval pseudobulbs at the base. The smooth stem grows vertically with a sympodial branching pattern. It has lanceolate leaves that are approximately 86 cm long and 2.1 cm wide, with pointed tips and narrowing bases attached to the pseudobulb. The glossy dark green leaves have an entire margin and parallel venation, arranged oppositely on the pseudobulb. The upright flower stalk, about 61 cm long, bears a green cluster-shaped inflorescence. Each flower has a distinct yellowish-green stem and is bright yellow, bilaterally symmetrical, with three oval-shaped sepals, three petals (two resembling sepals), and a brightly coloured labellum.

15. *Spathoglottis plicata* Blume

S. plicata has a slender, sturdy green stem with oval pseudobulbs at the base. The smooth stem grows erect with a sympodial branching pattern. It features lance-shaped leaves, approximately 41.5 cm long and 5.1 cm wide, with a pointed tip and a narrowing base that attaches to the pseudobulb. The glossy, dark green leaves have entire margin

and parallel venation, arranged alternately. The flower stalk, about 56 cm long, grows upright from the pseudobulb, bearing a green cluster-shaped inflorescence at the tip. Each bright purple flower has a distinct purple stem and is bilaterally symmetrical, consisting of three oval-shaped sepals, three petals (two resembling sepals), and a brightly colored labellum.

16. *Tainia wrayana* J.J.Sm.

T. wrayana has a round, moist, branching, prostrating stem that is smooth and brownish-green, lacking pseudobulbs. Each stem produces an oval leaf measuring 6.6 to 8.9 cm long and 4 to 5.6 cm wide, with a pointed tip and indented base. The dark green leaf has a glossy surface, entire margin, and a curved venation pattern.

Epihytic species

17. *Acriopsis liliifolia* (J. Koenig) Ormerod

A. liliifolia features an oval-shaped pseudobulb as its main stem, measuring 1.2 to 2.3 cm long and approximately 1.3 cm in diameter, with a dark green, smooth surface and sympodial branching. It grows in clumps, producing axillary buds that develop into new leaves or flower stems. The lanceolate leaf measures 4 to 11 cm long and 0.2 to 0.9 cm wide, with a pointed tip, a narrowing base, and glossy, entire margin, arranged alternately from the pseudobulb.

18. *Adenoccos Sumatrana* J.J.Sm.

Adenoccos sumatrana has a short, round, slender, slightly fleshy stem that grows erect with a slight curve and exhibits a sympodial branching type. It has lanceolate leaf measuring 0.6-4 cm in length and 0.2-0.3 cm in width, with a thickness of approximately 0.2 cm. The leaf tip is pointed, thick, and fleshy, lacking a stem. The leaf surface is smooth and dark green in color.

19. *Agrostophyllum majus* Hook.f.

Agrostophyllum majus has a flattened stem with sympodial branching that grows upright, forming dense clumps, and is light green in color. Its surface is smooth, with closely spaced nodes, and it lacks pseudobulbs. The leaves are simple, lanceolate in shape, measuring 2 to 11.3 cm in length and 0.7 to 1.7 cm in width. The leaf tips are blunt, the bases taper, and the surfaces are glossy, with smooth edges and a dark green color. The venation pattern is parallel, with the leaves arranged in a spiral along the stem.

20. *Ascidieria longifolia* (Hook.f.) Seidenf.

Ascidieria longifolia has a slender, cylindrical, and upright stem with sympodial branching. It is light green with a smooth surface and does not have pseudobulbs. The leaves are simple, lanceolate in shape, measuring 5.7 to 17.8 cm in length and 0.2 to 1.3 cm in width, with both the tips and bases tapering to a point. The leaves have a glossy dark green surface, smooth margins, and are arranged spirally at the tip of the stem.

21. *Bulbophyllum lobbii* Lindl

Bulbophyllum lobbii, or "Tiger Claw Orchid" (Ritonga, 2019), features a bulbous pseudobulb as its main stem, measuring 2 to 3 cm in length and about 1.1 cm in diameter. The light green stem is smooth and grows upright with sympodial branching. It has elongated leaf, 10.7 to 15.1 cm long and 2.4 to 3.3 cm wide, with a rounded tip, tapering base, and short petiole. The leaf is dark green, smooth, glossy, and slightly fleshy, produced from each pseudobulb.

22. *Bulbophyllum violaceum* Lindl

Bulbophyllum violaceum has a pseudobulb as the main stem, which is elongated, pointed at the tip, ribbed, and has short creeping stems with a distance of approximately 1.2 cm between them. It is light green in color, with a smooth surface and a sympodial branching type. It has lanceolate leaf measuring approximately 1.5 cm in length and 0.4 cm in width. Both the tip and base of the leaf are blunt, with a short petiole, entire margin, and a smooth, glossy surface that is thick and slightly fleshy, dark green in color. The leaf venation pattern is parallel, and the leaves grow between the pseudobulbs.

23. *Ceratostylis ampullacea* Kraenzl.

Ceratostylis ampullacea has a slender, short, moist stem that is light green and covered with an old net-like leaf sheath. It grows sideways in a stacked formation, exhibiting sympodial branching, and lacks pseudobulbs. The cylindrical leaf measures 1 to 13.1 cm long and about 0.5 cm wide, is fleshy, pointed at the tip, and attached directly to the stem without a petiole. The leaf surface is smooth, glossy, and light green with entire margin.

24. *Ceratostylis crassipetala* J.J.Sm.

Ceratostylis crassipetala has a round, short, slender stem that is moist, fleshy, and light green, covered with an old net-like leaf sheath. The stem grows sideways in a stacked formation, exhibiting sympodial branching and measuring 3 to 4 cm in length, without pseudobulbs. It has a lance-shaped leaf that measures 12 to 15 cm long and about 0.8 cm wide. The leaf is slightly fleshy, pointed at the tip, and narrows at the base, attaching directly to the stem without a petiole. Its surface is smooth, glossy, and dark green with entire margin.

25. *Ceratostylis leucantha* Schltr.

C. leucantha has a round, short, slender stem that is moist, light green, and covered with a net-like old leaf sheath. The stem grows sideways in a stacked formation, exhibiting sympodial branching and measuring 3.5 to 5 cm long, without pseudobulbs. It has cylindrical leaf measuring 6 to 18 cm in length and approximately 0.3 cm in width. The fleshy leaf is pointed at the tip and attaches directly to the stem without a petiole. Its surface is smooth, glossy, dark green, and has entire margin.

26. *Ceratostylis radiata* J.J.Sm.

Ceratostylis radiata has a short, slender, upright stem that is light green, wet, and covered with a net-like layer of old leaf sheaths. It exhibits sympodial branching and lacks pseudobulbs. The plant features lanceolate leaves measuring 6.5–14.5 cm in length and 1.6–1.7 cm in width, with blunt tips and narrowed bases. The leaves have a smooth, shiny surface, entire margin, and are dark green with parallel venation, growing scattered along the stem. It produces small, yellowish-white flowers, about 1 cm long, that emerge from the leaf axils or the stem tip.

27. *Celogyne cuprea* H.Wendl. & Kraenzl.

Celogyne cuprea features an oval-shaped pseudobulb as its main stem, measuring 3.6–5.1 cm long and about 2.5 cm in diameter. It is dark green with a smooth surface and white spots, growing upright with a slight inclination and exhibiting sympodial branching. Each pseudobulb produces two elongated leaves, measuring 9.3–13.3 cm in length and 4–5.4 cm in width, with a blunt tip and tapering base. The leaves are smooth, glossy, dark green, and have irregular white spots, with a parallel venation pattern. The flowering stem, approximately 28 cm long, emerges at the tip of the pseudobulb between the two leaves.

28. *Dendrobium capitellatoides* J.J.Sm.

Dendrobium capitellatoides features a flattened, moist stem that is dark green, smooth, and lacks pseudobulbs, with nodes spaced about 1.4 cm apart. It has a lanceolate leaf measuring 1–2.3 cm long and 0.2–0.3 cm wide, with a pointed tip and curved upper edge. The leaf is glossy, firm, dark green, and arranged alternately along the stem. The inflorescence is a raceme emerging from the upper nodes, bearing small trumpet-shaped flowers on short stalks. These flowers measure about 0.7 cm in length, with a creamy yellow interior, pink exterior, and striking striped patterns.

29. *Dendrobium rhombeum* Lindl

D. rhombeum has an elongated pseudobulb as its main stem, measuring 11.1–23.6 cm long and 0.6–13.7 cm wide. It is yellow-green with slight wrinkles and exhibits sympodial branching. A lanceolate leaf, 4.2–5.6 cm long and 0.2–0.3 cm wide, arises from the base of the pseudobulb, featuring blunt tips, entire margin, and a smooth light green surface. The capsule-shaped fruit measures 3–5 cm long and 0.6–0.7 cm wide, also yellow-green with slight wrinkles.

30. *Eria pachystachya* Lindl

E. pachystachya has a round, moist stem that is slender at the base and thickens towards the tip, brownish-green in color, and features small oval pseudobulbs. The stem is smooth and can grow either erect or at an angle, exhibiting sympodial branching with 5–7 leaves per stem. Each leaf is lanceolate, measuring 8–13 cm long and 0.4–1.2 cm wide, with a pointed tip, tapering base, entire margin, and a smooth, glossy dark green surface. The leaves have parallel venation and are sparsely distributed along the stem.

31. *Pteroceras teysmannii* (Miq.) Holttum

Pteroceras teysmannii features a moist, green, round stem with a smooth surface and erect growth. It lacks pseudobulbs and has monopodial branching, with new branches emerging from leaf axils. The plant has an elongated leaf measuring 5–7.9 cm long and 1.6–3.1 cm wide, with a pointed tip and smooth, glossy dark green surfaces. The leaves are arranged alternately along the stem, displaying a parallel venation pattern. Its raceme inflorescence, emerging from the upper nodes, bears small, star-shaped flowers on short stalks, which are cream-colored with red splashes inside. The flowers have oval sepals and petals, and a trumpet-shaped labellum. The fruit is a slender dry capsule approximately 11 cm long.

32. *Stichorkis confusa* (J.J.Sm) V. Agustin

Stichorkis confusa features a moist, green, round stem with a smooth surface that grows erect. It has an oval pseudobulb closely attached to the rhizome, showing sympodial branching. The plant has lanceolate leaf measuring 3.5–8.8 cm long and 0.5–0.8 cm wide, lacking a petiole. The leaf has a pointed tip, entire margin, and smooth, glossy dark green surfaces. Its venation pattern is parallel, with two leaves emerging from the tip of the pseudobulb.

CONCLUSIONS

The exploration conducted in the forest of Desa Serdang revealed a total of 32 orchid species, consisting of 16 terrestrial orchid species from 13 genera and 16 epiphytic orchid species from 11 genera. There is no altitudinal preference for either terrestrial or epiphytic orchids

AUTHOR CONTRIBUTIONS

I.A. conceived the ideas presented, developed the theory. I.A. and Y.E.R. conducted the research, and created the herbarium. I.A. contributed to the design and implementation of the study and to the writing of the manuscript. I.A. and W.D.P.S. discussed the study design and the results.

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