Species diversity of epiphytic orchids in natural reserve of Mount Sibela, North Moluccas

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Purnomo and Andaru Satryo

Species Diversity of Epiphytic Orchids in Natural Reserve of Mount Sibela, North Moluccas

Purnomo[1, a)] and Andaru Satryo[2]

[1]*Laboratory of Plant Systematics, Faculty of Biology, Universitas Gadjah Mada.*
[2]*Graduate Student on Faculty of Biology, Universitas Gadjah Mada.*
Jl. Teknika Selatan, Sekip Utara, Sleman, Yogyakarta, 55281, Indonesia

[a)]Correspondence author: pakkencur@yahoo.com

Abstract. Sibela Mount Natural Reserve is located in South Halmahera, North Moluccas, Indonesia. It covers a 23 232 ha area of coastal forest, lowland rain forest and highland rain forest. The altitude range between 0 m to 2 110 m. above sea level (asl). Orchid exploration and inventory were conducted to study orchid diversity and distribution on this conservation areas. Observation on the population of epiphyte orchids was also done to study the dominant orchid in that area. It was recorded that there were 30 orchid species belonging to 14 genera (i.e. Aerides, Agrostophyllum, Bulbophyllum, Coelogyne, Dendrobium, Diplocaulobium, Eria, Flickingeria, Luisia, Pomatocalpa, Phreatia, Thelasis, Trichoglottis and Vandopsis) which were genera is the member of Epidendroideae subfamily. The genus with the highest frequency (44.59 %) was Dendrobium. Regarding elevation, the highest distribution of the epiphytic orchids in coastal forest and lowland rain forest ecosystem at 0 m to 600 m. asl.

Keywords: Epiphytic orchids, natural reserve, Sibela mount.

INTRODUCTION

Mollucas island is one of Middle Indonesia regions which is located near Wallace as a centre of plant diversity from Asia and Australia and this region presumably have high plant diversity [1, 2]. Mollucas have some conservation areas, one of them is *Cagar Alam Gunung Sibela* on South Halmahera, North Mollucas.

Orchid plant have a high species diversity, or there is many information about orchid on this area, but recent detail information of local distribution and ecological study on this conservation areas is still limited [3]. The recent publication of orchid species on preliminary research by Thomas and Schuiteman for orchid from Mollucas and Celebes composed of more-less 820 species, 40 % (272 species) was found in Mollucas Island, including the epiphytic Orchids [4].

Natural reserve of Sibela Mount North Mollucas is 23 024 ha large, with undulate and hill topography. Sibela is one of the highest Mount on 2118 m above sea level (asl.), the hill slopes 45 % to 55 %, and the middle had 60 % to 70 % hill slope condition. The ecosystem of Sibela Mount is mountain and tropical rain forest type. The objectives of this research were to identify the epiphytic orchids diversity and to determine the local distribution of Orchids species in Sibela Mount Natural Reserve North Mollucas [4].

MATERIALS AND METHODS

Samples collection was conducted by exploration method with random sampling on the west of natural reserve of Sibela mount via Sawadai village. The exploration, was conducted on the location, including morphological characterization and photography. Samples collection including leaves and flowers were processed as dried specimens. Morphological characters investigated were pseudostem, leaf position, leaf sheaths, leaf blades, leaf

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shape, flower position and a part of the flowers. Morphological data were analysed descriptively to find morphological characteristic for identification epiphytic orchids species. Finally, species identification were conducted based on identification keys [3, 5, 6, 7, 8, 9].

RESULTS AND DISCUSSIONS

Epiphytic Orchids Distribution In Sibela Mount

The results of the research showed that that on Natural Reserve in Sibela mount was identified 30 epiphytic orchids species including to 14 genera i.e. 8 species of *Dendrobium*, 5 species of *Bulbophyllum*, 3 species of *Eria*, 2 species of *Pomatocalpa*, 2 species of *Thelasis* and *Aerides*, *Agrostophyllum*, *Coelogyne*, *Diplocaulobium*, *Flickingeria*, *Luisia*, *Phreatia*, *Trichoglottis*, *Vandopsis* each 1 species. Species names, frequency, number of individual and research station was shown in Table 1.

TABLE 1. Genera and species names, frequency, some individual and a research station of epiphytic orchids on Sibela Mount.

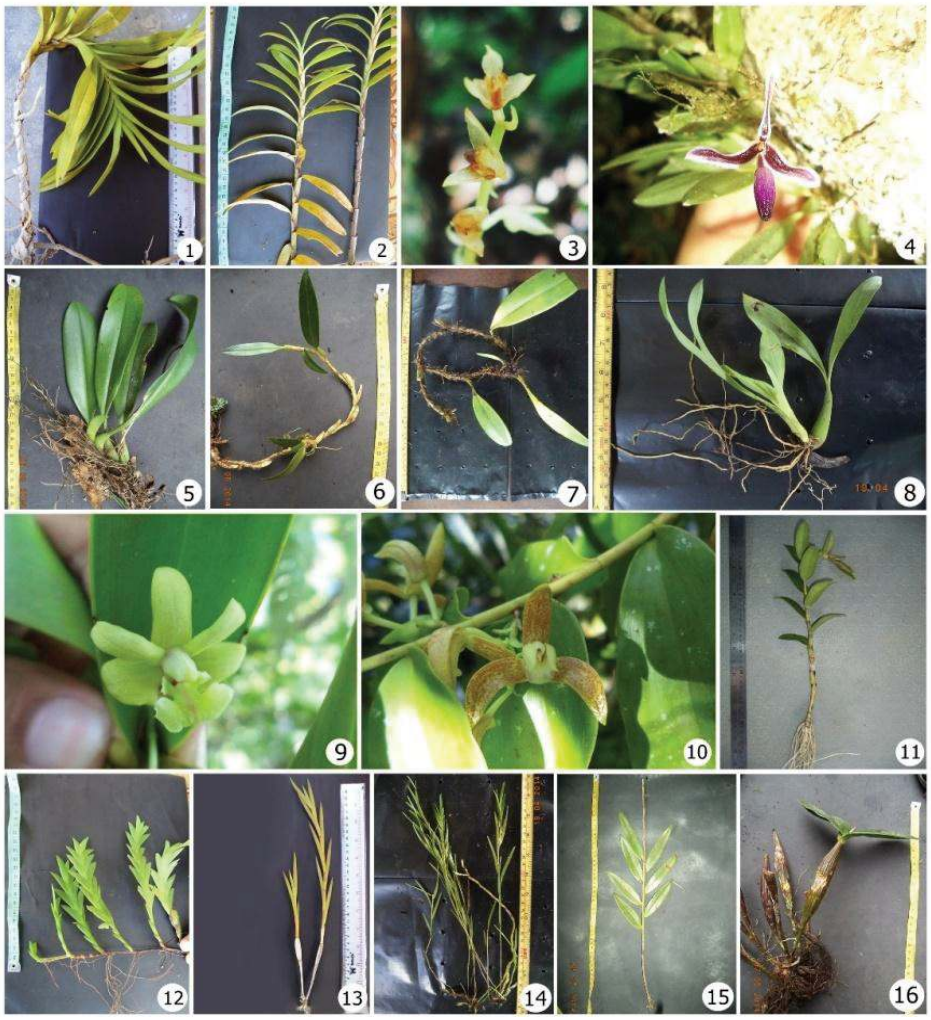
Species Names	Frequency %	Number of Individuals %	Research Station			
			1	2	3	4
Aerides sp.	2.08	0.81	3	-	-	-
Agrostophyllum sp.	1.04	0.81	3	-	-	-
Bulbophyllum gibossum	3.13	2.70	10	-	-	-
Bulbophyllum violaceum	3.13	7.55	-	-	8	20
Bulbophyllum sp.1	2.08	2.70	5	5	-	-
Bulbophyllum sp.2	2.08	3.50	-	-	-	13
Bulbophyllum sp.3	1.04	1.35	5	-	-	-
Coelogyne sp.	1.04	0.81	3	-	-	-
Dendrobium sp.1	1.04	2.70	10	-	-	-
Dendrobium sp.2	4.17	4.04	15	-	-	-
Dendrobium sp.3	3.13	2.96	3	8	-	-
Dendrobium sp.4	5.21	4.58	5	12	-	-
***Dendrobium* sp.5**	**13.54**	**15.09**	4	52	-	-
***Dendrobium* sp.6**	**11.46**	**12.13**	4	30	11	-
Dendrobium sp.7	2.08	2.16	-	-	5	3
Dendrobium sp.8	1.04	0.81	-	3	-	-
Diplocaulobium sp.	2.08	2.16	-	6	2	-
Eria javanica	3.13	7.28	27	-	-	-
Eria sp.1	1.04	0.81	3	-	-	-
Eria sp.2	4.17	1.89	-	-	-	7
Flikingeria sp.	1.04	0.81	-	3	-	-
Luisia sp.	1.04	0.81	3	-	-	-
Phreatiaplantaginifolia	6.25	2.43	-	9	-	-
Pomatocalpa spicata	1.04	0.54	-	2	-	-
Pomatocalpa sp.1	1.04	0.81	1	2	-	-
Thelasis sp.1	1.04	0.27	1	-	-	-
Thelasis sp.2	1.04	0.27	1	-	-	-
***Trichoglottis* sp.**	**15.63**	**9.43**	10	23	2	-
Vandopsis lissochiloides	3.13	7.55	28	-	-	-
Spesies 1	1.04	0.27	-	-	1	-
	100 %	**100 %**	**144**	**155**	**29**	**43**

Notes: - = not found, 1 = RS 1 (research station 1) on 0 m to 300 m. asl., 2 = RS 2 on 300 m to 600 m. asl., 3 = RS 3 on 600 m to 900 m. asl., RS 4 = research station 4 on 900 m to 1 200 m. asl.

The continuous distribution was identified as *Dendrobium* sp.6 and *Trichoglottis* sp. found at three research stations (1, 2, 3) from 0 m to 600 m. asl. That distribution indicated that *Dendrobium* sp.6 and *Trichoglottis* sp. had the ability to adapt to some environmental factors or high tolerance as euryecious orchids.

Species Identification of Epiphytic Orchids

Identification was conducted based on some samples of epiphytic Orchids collected from research areas resulted in the genera and species of epiphytic Orchids and the list of the genera and species of epiphytic orchid were presented in Fig. 1 below.



Continued next page

Figure 1. Continued

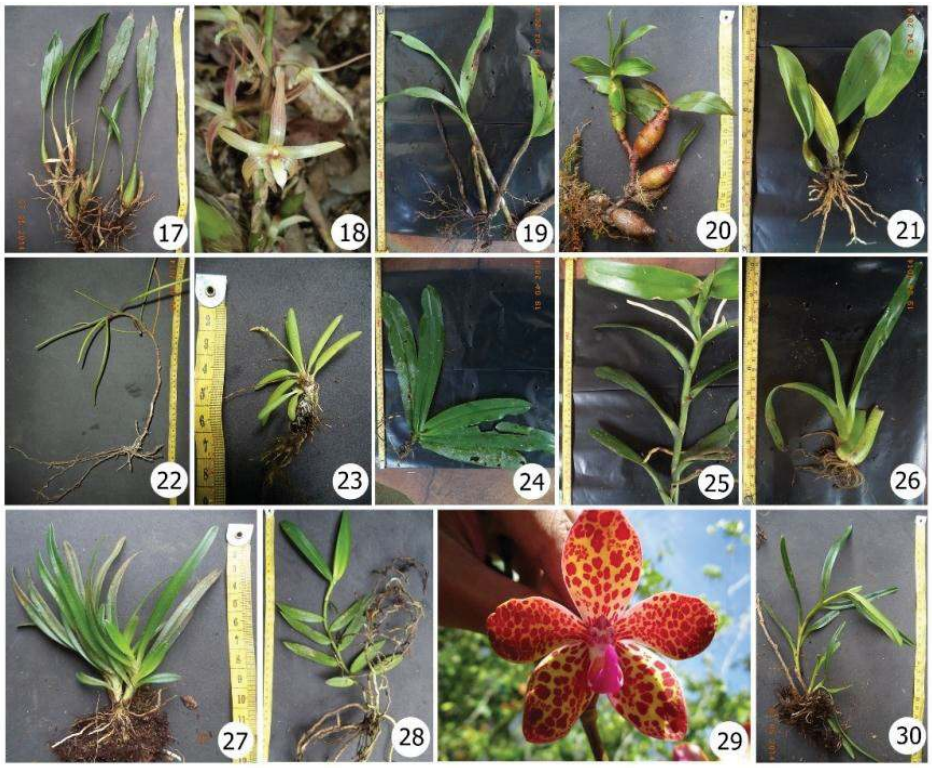


FIGURE 1. Epiphytic Orchids on natural reserve Sibela Mount, South Halmahera, North Mollucas. (1) *Aerides* sp., (2) *Agrostophyllum* sp., (3) *Bulbophyllum gibbosum* (BIume) Lindl., (4) *Bulbophyllum violaceum* (BIume) Lindl., (5) Bulbophyllum sp.1, (6) Bulbophyllum sp.2, (7) Bulbophyllum sp.3, (8) Coelogyne sp., (9) Dendrobium sp.1, (10) *Dendrobium* sp.2, (11) *Dendrobium* sp.3, (12) *Dendrobium* sp.4, (13) *Dendrobium* sp.5, (14) *Dendrobium* sp.6, (15) *Dendrobium* sp.7, (16) *Dendrobium* sp.8, (17) *Diplocaulobium* sp., (18) *Eria javanica* (Sw) BIume., (19) *Eria* sp.1, (20) *Eria* sp.2, (21) *Flikingeria* sp., (22) *Luisia* sp., (23) *Phreatia plantaginifolia* (J.König) Ormerod., (24) *Pomatocalpa spicata* Br., (25) *Pomatocalpa* sp.1, (26) *Thelasis* sp.1, (27) *Thelasis* sp.2, (28) *Trichoglottis* sp., (29) *Vandopsis lissochiloides* (Gaudich) Pfitzer, (30) Species 1.

Large distribution of orcihds indicated higher environmental adaptation with unlimited outcross [7]. *Bulbophyllum* species as epiphytic orchid had a tendency to live in the shaded area. *Bulbophyllum gibossum*, *Bulbophyllum violaceum, Bulbophyllum* sp.1 and *Bulbophyllum* sp.2 were found in shaded areas. *Bulbophyllum violaceum* was found on some individual at 900 m to 1 200 m. asl (RS 4). more growth lowland forest at 200 m to 1 000 m. asl [10]. According to Puspaningtyas and Fatimah [8], the distribution pattern of orchids species on tree stems or branches influenced by sun rays and humidity [8]. *Pomatocalpa spicata* was more suitable to the shaded area (< 50 %). *Phreatia plantaginifolia* was epiphytic on trees. *Luisia* sp. was an orchid species with natural growing, the stem produced pendulans [11]. At the root of mangrove area on 5 m. asl was found four orchids species; *Dendrobium* sp.1, *Dendrobium* sp.2, *Eria javanica* and *Vandopsis lissochilodes*. All of the four orchid species were able to adapt to the high temperature of habitat. *Vandopsis lissochilodes* had the ability adapted as epiphytic, terrestrial or lithophyte [7].

CONCLUSION

Out of 30 samples of orchids on Natural reserve of Sibela Mount area, there was 15 generas identified and six species as *Bulbophyllum gibbosum* (BIume) Lindl., *Bulbophyllum violaceum* (BIume) Lindl., *Eria javanica* (Sw) BIume., *Phreatia plantaginifolia* (J.König.) Ormerod., *Pomatocalpa spicata* Br. and *Vandopsis lissochiloides* (Gaudich) Pfitzer. The high distribution of orchids species was on 0 m to 600 m. asl. included lowland rain forest. Orchids with relatively high frequency were from the genus *Trichoglottis* sp. (15.63 %), *Dendrobium* sp.5 (13.54 %), and *Dendrobium* sp.6 (44.59 %).

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