# SPECIES COMPOSITION OF ORCHIDS IN DIFFERENT MUNICIPALITIES OF NORTHERN SAMAR


## ABSTRACT

Orchids are one of the largest and most diverse groups among the Philippine flowering plants, harboring over 1200 species, varieties and forms. Thus, this study was conducted to identify the orchids species in nine (9) sampling sites, as well the anthropogenic activities and economic uses. Purposive sampling techniques was applied in this study, which is in a form of sampling technique in which the selection of sample is based on the researcher's own judgment that will fit in the criteria of the study. A total of seventy-one (71) varieties of orchids were identify in nine sampling areas belonging to eighteen genera (18) which implied that Northern Samar are rich in varieties of orchid species, although anthropogenic activities need to be minimized to protect these orchid species.



**Keywords:** anthropogenic, exploitation, habitat, orchid, species




## I. INTRODUCTION

The biodiversity of Northern Samar has long been underrepresented in the scientific literature, as evinced by the lack of published studies on biodiversity in the region. This study augments this gap and highlights the substantial level of biodiversity in Northern Samar, particularly of the orchidaceous species which are among the most diverse yet threatened groups of plants globally and in the Philippines. Orchids are the largest and the most diverse family of angiosperm plants and are widely used in traditional medicine as remedies for severe diseases (Pant and Raskoti, 2013).

There are about 141 genera of orchids representing about 1,100 orchid species, 900 of which are described as endemic to the Philippines (Cootes, 2011), with more new species and genera being discovered and recorded yearly (e.g. de Leon et al. 2017; Naive and Martyr 2018; Meneses and Cootes 2019; Naive et al. 2019; Militar and Vicencio, 2019; Tamayo et al. 2020; Tandang et al. 2020). Around 25 genera and 104 species are of commercial value. Many of the endemic species have contributed significant roles in the orchid hybridization work in various countries. Among them are *Vanda sanderana or* "waling-waling",*V. merrillii, V. lamellata, V. luzonica, Aerides lawrenceae, A. jarchiana, Phalaenopsis amabilis, P. lueddemanniana, P. pulchra*, *Renanthera storei*, *R. philippinensis*, *Dendrobium taurinum* among many others (Valmayor, 1984).

Habitat destruction and unsustainable harvesting are the major global threats to orchids (Fay 2018; Gale et al. 2018). Habitat fragmentation negatively impacts species richness of orchids (Hundera et al. 2013; Parra Sánchez et al. 2016), and their highly specialized habit makes orchids more vulnerable to global environmental changes (Fay 2018). Orchids are also highly traded mainly for horticulture, medicine, and food (Hinsley et al. 2017). Despite being regulated under the Convention on International Trade in Endangered Species, many of the species are still being collected and traded undocumented negatively affecting wild populations around the world (Fay 2015). The National List of Threatened Philippine Plants of Fernando et al. (2008), stated that there are 19 species categorized as critically endangered, 35 endangered species, and 3 vulnerable species in the family Orchidaceae.

Here, we study the orchids that will helps improve our understanding of orchid diversity and ecology and will address the gaps in our knowledge and distribution of Philippine orchids. The result of this study will be helpful not only in elucidating the level of biodiversity in Northern Samar but also in inferring patterns of plant diversity and biogeography in the Philippines.

**Detailed Methodology:**

Northern Samar is subdivided into three areas, namely: Balicuatro Area, Central Area and the Pacific Region. The province lies in in the northeast portion of the island of Samar, Philippines with longitudes 12˚15' – 12˚45' and latitudes of 124˚15' – 125˚30'. It is one of the six provinces comprising Region VIII. The province consists of twenty-four (24) municipalities. Catarman is the capital town (Galenzoga, Quiñones, 2014).

Plant Survey

Extensive survey of Orchid species was carried out using purposive sampling techniques. Municipalities identification was based on geographic location (distribution) and accessibility.

Plant Collection

Actual survey and collection of Orchidaceae species was done by the researcher with the help of some informants and forest guide. Samples was tag and properly documented using a field notebook with the following information: date and place of collection, local name, as well as the economic importance and anthropogenic activity.

All orchid species encountered were photographed in situ whenever possible. We did not collect voucher specimens for conservation reasons. Only one or a
few individuals of most species of orchids recorded were observed, and many of these species are already being collected for ornamental use. All species were identified based on photographic guides (Cootes 2001, 2011; Pelser et al. 2011 onwards), expert consultations (e.g. through the online plant identification platform of the Co's Digital Flora of the Philippines; Barcelona et al. 2013), and taxonomic papers in orchids (Clements and Cootes 2009; Cabactulan et al. 2018).

**Determination of the Anthropogenic Activities**

Data and information about the anthropogenic activities in the study area was determine through the use of an interview guide distributed to the respondents living in the area.

**Determination of the Economic Uses of Orchids**

Data and information about the economic uses of orchids in the study area was gather through the use of a researcher- made interview guide. In every study site (10) individuals, commonly a farmer and permanently living in the area serve as the respondents of this study.

**Results and Discussion**

**Distribution of Orchid Species in Selected Municipalities of Northern Samar**

Table 1 show the initial list of identified species of orchids in selected municipalities of Northern Samar. The list showed seventy-one (71) species of orchids in nine (9) sampling sites. These were represented by eighteen (18) genera, namely, Acamphe, Arachnis, Aranda, Bulbophyllum, Cattleya, Cymbidium, Dendrobium, Epidendrum, Guarianthe, Leptotes, Oeceoclades, Oncidium, Papilionanthe, Phalaenopsis, Rhynchostylis, Vanda, Vappodes and *X. mokara.*

**Table 1**
Orchid Species in Selected Municipalities of Northern Samar

| **Species Name** (Common Name) | Biri | Catarman | Laoang | Lavesarez | Palapag | Rosario | San Isidro | San Roque | Silvino Lobos |
|---|---|---|---|---|---|---|---|---|---|
| **Acamphe pachyglossa** | / | x | X | x | x | x | x | X | |
| **Arachnisflos-aeris** (spider orchid) | / | x | X | x | / | x | x | X | / |
| **Aranda broga** | x | x | X | x | / | x | x | X | / |
| ***Bulbophyllum longifolium*** | / | x | / | x | x | / | / | / | x |
| ***Cattleya mendelii*** (Columbian orchid) | x | x | X | / | x | x | x | X | / |
| ***Cattleya labiata*** (Crimson or Ruby-lipped cattleya) | x | / | / | x | / | x | / | / | x |
| ***Cattleya pumila*** (Dwarf sophronitis) | x | x | x | / | x | / | x | X | x |
| ***Cattleya violecia var superba*** | x | / | x | x | x | x | x | X | / |
| ***Cymbidium aloifolium*** (Aloe-leafed cymbidium) | / | x | / | / | / | x | / | / | x |
| ***Cymbidium finlaysonianum*** | / | x | x | x | x | x | x | X | x |
| ***Dendrobium affine*** (White butterfly orchid) | x | / | x | / | x | / | x | / | x |
| ***Dendrobium 'airy peach'*** | x | x | / | x | x | x | x | X | X |
| ***Dendrobium anosmum*** (Purple rain orchid) | / | / | / | / | / | / | / | / | / |
| ***Dendrobium austrocaledonium*** (Tea three orchid) | x | x | x | / | x | x | x | X | X |
| ***Dendrobium bigibbum*** (Cooktown orchid) | x | / | / | / | / | / | / | / | X |
| ***Dendrobium bigibbum var. phalaenopsis*** (Cooktown orchid) | / | x | x | / | x | / | x | X | X |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Dendrobium burana 'Diamond'** | x | / | / | / | x | / | x | X | / |
| **Dendrobium burana 'green jade'** | x | x | / | x | x | x | x | / | X |
| **Dendrobium burana 'charming white'** | x | x | / | x | / | x | x | X | X |
| **Dendrobium crumenatum** (Dove orchid) | / | / | / | x | x | / | / | / | / |
| ***Dendrobium dearie*** **(**Deares dendrobium) | x | x | x | / | x | x | x | X | X |
| ***Dendrobium delicatum*** | / | / | x | x | / | / | x | X | / |
| ***Dendrobium*** 'Emma White | x | x | x | / | x | x | x | X | X |
| ***Dendrobium fractiflexum*** | / | x | x | x | x | x | x | X | X |
| ***Dendrobium lasianthera*** | x | / | x | / | / | / | x | X | X |
| ***Dendrobium nobile*** (Noble dendrobium) | / | / | / | / | / | x | / | / | / |
| ***Dendrobium kingianum*** (Charming white orchid) | x | / | x | / | x | x | x | / | / |
| ***Dendrobium phalaenopsis*** (Mauve butterfly) | / | / | x | x | / | / | / | X | / |
| ***Dendrobium phalaenopsis 'hybrid'*** | x | / | x | x | x | x | x | X | X |
| ***Dendrobium phalaenopsis var. hololeucum*** | x | / | x | x | x | x | / | X | X |
| ***Dendrobium petticoat*** | x | / | / | / | | / | x | X | X |
| ***Dendrobium sonia*** (Pink dendrobium) | / | / | x | / | / | / | / | / | X |
| ***Dendrobium 'pink veined or stripe'*** | x | / | x | x | x | / | x | X | X |
| **Dendrobium 'sugar pink'** (Pink lorco) | x | / | x | / | / | x | x | X | X |
| **Dendrobium pangasinanense (**Pangasinan orchid) | x | x | x | | x | / | x | X | X |
| **Dendrobium schulleri** | | | / | / | x | x | x | X | / |
| **Dendrobium taurinium** | / | / | | / | / | / | / | / | / |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| (Bull orchid) | | | | | | | | | |
| **Dendrobium uraiwan** (Uranaiwan orchid) | x | x | / | x | / | x | x | / | X |
| ***Dendrobium victoriae-reginae*** ***(***Queen Victoria dendrobium) | / | xx | | / | x | x | x | / | X |
| ***Epidendrum ciliare*** | x | x | x | x | x | / | / | X | X |
| ***Epidendrum ibaguense*** | x | x | x | x | x | x | / | X | X |
| ***Epidendrum radicans*** *(*fire-star orchid) | / | / | x | x | x | x | / | / | / |
| ***Epidendrum rigidum*** | x | x | x | x | x | x | / | | / |
| ***Guarianthe skinneri*** ***(***Purple Guaria) | / | / | x | / | / | / | / | X | X |
| ***Leptotes bicolor*** (Bicolor orchid) | x | x | / | x | x | x | x | X | X |
| ***Oeceoclades maculata*** *(*Monk orchid) | x | x | x | / | x | x | x | X | X |
| ***Oncidium altissimum*** | x | x | x | x | x | / | / | X | X |
| ***Oncidium varicosum*** (Dancing lady) | / | / | / | / | / | / | / | / | / |
| ***Papilionanthe teres*** ***(***Cylindrical vanda) | x | x | / | / | x | x | / | / | X |
| ***Papilionanthe vandarum*** | / | x | x | x | x | x | x | X | X |
| ***Phalaenopsis amabilis*** (Moth orchid) | / | / | / | /x | x | x | / | / | X |
| ***Phalaenopsis aphrodite*** | x | / | / | x | / | / | x | X | / |
| ***Phalaenopsis equestris*** | / | x | / | x | x | xx | / | X | X |
| ***Phalaenopsis fasciata*** (Striped flower phalaenopsis) | x | x | x | / | x | x | x | X | X |
| ***Phalaenopsis fuller*** | x | x | x | x | / | x | x | X | X |
| ***Phalaenopsis lindenii*** *(*Pumpkin beth orchid) | x | x | x | / | / | x | x | X | / |
| ***Phalaenopsis lueddemanniana*** | / | x | x | / | x | x | x | X | X |
| ***Phalaenopsis schilleriana*** | / | x | x | x | / | x | x | / | X |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| (Moth orchid) | | | | | | | | | |
| ***Phalaenopsis singulifloa*** | / | x | x | x | x | x | / | X | X |
| ***Rhynchostylis retusa*** (Foxtail orchid) | x | x | / | / | x | x | x | X | X |
| ***Spathoglottis plicata*** (Rose Pink ground orchid) | / | / | / | / | / | x | x | X | / |
| ***Spathoglottis plicata*** (Purple ground orchid) | / | / | / | / | | / | x | / | / |
| ***Spathoglottis plicata*** (White ground orchid) | / | / | / | / | / | / | / | / | / |
| ***Vanda charles goodfellow x tessellate alba*** (Yellow orchid) | x | / | x | x | x | x | x | X | X |
| ***Vanda coerulescens*** *(*Orange color) | / | / | x | / | / | x | / | X | / |
| ***Vanda coerulescens*** *(*Pink color color) | / | x | x | x | x | x | / | / | X |
| ***Vanda denisoniana*** (Lady Denison Londesborough's Vanda) | x | / | / | x | x | x | x | / | X |
| ***Vanda josephine*** Brero (Vanda JBV hybrid) | x | / | x | x | x | / | x | / | / |
| ***Vanda 'miss joaquim'*** (Cylindrical vanda) | x | / | x | x | x | x | x | X | X |
| ***Vanda scadens*** | x | x | x | x | / | x | x | X | X |
| ***Vanda usha*** | / | / | | / | / | | / | | / |
| ***Vappodes phalaenopsis*** *(Cooktown orchid)* | x | / | x | x | / | x | x | X | x |
| ***X mokara*** (Mokara orchid) | x | x | / | / | x | / | / | X | x |
| **TOTAL** | **30** | **34** | **26** | **35** | **27** | **25** | **27** | **24** | **25** |

Legend: /=present x=absent

As shown in the table 1, there are nine municipalities which serve as the sampling sites, namely, Biri, Catarman, Laoang, Lavesarez, Palapag, San Isidro, San Roque, Silvino Lobos, and Rosario. Of the nine municipalities, Lavesarez (35), Catarman (34) and Biri (30) has the most number of orchids. Whereas, San Roque (25), Rosario (25) and Silvino Lobos (24) has the least number of orchids.

Result implies that the nine sampling sites are rich in varieties of orchid species. And among the nine barangays, Lavezares and Catarman are the most inhabited of these species.

**Anthropogenic Activities**

As human population is expanding, increased pressure id being placed on natural area, including areas with numerous threatened orchid species. Based on observation and actual interview held in nine (9) sampling areas, three anthropogenic activities are identified by the researcher that are commonly affecting the distribution of orchid species in Northern Samar. Local collections have been observed in nine (9) sampling areas for ornamental purposes. Upon interviewing the local residents, some locals confirmed that they trade with outside plant hobbyist and collectors.

In the process of land clearing, numerous individual plants and animals are killed or die soon after. However, climate change, especially global warming that brings about frequent extreme events could negatively impact orchid's adaptation and aggravate the species extinction. Therefore, many species are subject to decline and threatening by potential challenges of climate change. Habitat degradation and climate changes are exacerbated by the poaching and harvesting of orchid species, which remain a global threat to orchid population.

In this matter, the researcher suggests to implement an immediate restriction in collecting orchid species to maximize its number in their natural habitat. Official of each municipality should have necessity in protecting the species from being poach illegally and exposed in other threats.

**Economic Uses**

Economic importance of orchid species was identified through actual interview conducted by researcher in all sampling area. Local residents identified the seventy-one (71) species are economically importance in terms of horticulture and florist. They confirmed that they trade to outside hobbyist and collectors this species as plant stock.

It implies that, orchid species in the sampling area were known only for its ornamental uses and locals are unaware of other potential economic importance of orchids especially in medicine and food uses.

**Summary**

There were seventy-one (71) orchid species that were found in nine (9) municipalities of Northern Samar. These were represented of nineteen (19) genera. Based on the interview conducted in the sampling areas, anthropogenic activities in area affecting the distribution of orchids were identified as illegal poaching, land clearing and climate change or calamities.

**Conclusion**

The seventy-one (71) species of orchids implied that the area has a diversity of orchid species, although anthropogenic activities need to be minimized to protect these orchid species.

**Recommendation**

Restriction for collection of orchids should be implemented to local residents by municipal official to maximize the number of these species.

## IV. References

BARCELONA JF, NICKRENT DL, LAFRANKIE JV, CALLADO JRC, PELSER PB. 2013. Co's Digital Flora of the Philippines: plant identification and conservation through cybertaxonomy. Philippine Journal of Science 142: 57–67.

CABACTULAN DD, COOTES J, DE LEON MD, PIMENTEL RB, AURIGUE FB, BINAYAO III NK. 2018. Nineteen new orchid species from northern Mindanao, Philippines. Orchideen Journal 6: 1–21.

CLEMENTS M, COOTES J. 2009. The systematics of the Orchidaceae for flora Malesiana II: Miscellaneous Dendrobieae from the Philippines. Orchideen Journal 16:19–27

COOTES JE. 2011. Philippine Native Orchid Species. Quezon City, Philippines: Katha Publishing Co., Inc. 289p.

DE LEON MD, NAIVE MA, COOTES J. 2017. A new Ceratostylis (Orchidaceae) species from Bukidnon, Philippines. Phytotaxa 305(4): 299–300.

FAY MF. 2015. Undocumented trade in species of Orchidaceae. Retrieved on 09 Aug 2020 from https://cites.org/sites/default/files/eng/com/pc/22/Inf/E-PC22-Inf-06.pdf

FAY MF. 2018. Orchid conservation: how can we meet the challenges in the twenty-first century? Botanical Studies 59: 16.

FERNANDO ES, CO D, LAGUNZAD D, GRUEZO W, BARCELONA J, MADULID D, LAPIS A, TEXON G, MANILA A, ZAMORA P. 2008a. Threatened plants of the Philippines: a preliminary assessment. Asia Life Sciences Supplement 3: 1–52.

GALE SW, FISCHER GA, CRIBB PJ, FAY MF. 2018. Orchid conservation: bridging the gap between science and practice. Biological Journal of Linnean Society 186(4): 425–434.

HUNDERA K, AERTS R, DE BEENHOUWER M, VAN OVERTVELD K, HELSEN K, MUYS B, HONNAY O. 2013. Both forest fragmentation and coffee cultivation negatively affect epiphytic orchid diversity in Ethiopian moist evergreen Afromontane forests. Biological Conservation 159: 285–291.

HINSLEY A, DE BOER HJ, FAY MF, GALE SW, GARDINER LM, GUNASEKARA RS, KUMAR P, MASTERS S, METUSALA D, ROBERTS DL, VELDMANS, WONG S, PHELPS J. 2017. A review of the trade in orchids and its implications for conservation. Botanical Journal of the Linnean Society 186(4): 435–455.

MENESES ZD, COOTES JE. 2019. Pseuderia samarana (Orchidaceae), a new species and genus record from the Philippines. Taiwania 64(4): 353–356.

MILITAR, KM., R. BELGA, MCG VICENCIO, 2019. Inventory Assessment of Orchids in Selected Barangays of Palapag, Northern samar, Philippines, J. Bio Inno, 8 (3), pp. 375-390.

NAIVE MAK, MARTYR JC. 2018. Trichoglottis corazoniae (Orchidaceae: Vandeae: Aeridinae), a new species from the Philippines. Lankesteriana 18(2): 81–84.

NAIVE MAK, COOTES J, ORMEROD P. 2019. Stichorkis davidlohmanii (Orchidaceae; Malaxideae), a new species from the southern Philippines. Taiwania 64(1): 65–68.

PANT, B. and RASKOTI, B.B. (2013) Medicinal Orchid of Nepal. Himalayan Map House Pvt. Ltd., Kathmandu

TAMAYO MN, MC ANDREW KP, BUSTAMANTE RAA. 2020. Dendrochilum ignisiflorum (Coelogyninae, Arethuseae, Orchidaceae), a new species from Luzon Island, Philippines. Phytotaxa 455(4):240–244.

Vappodes phalaenopsis

Aranda broga

Arachnisflos-aeris

Oncidium varicosum

Phalaenopsis fuller

Dendrobium biaibbum

Dendrobium warawan

Dendrobium anosmum

P. luedemanniana

Vanda usha

Vanda JBV

Vanda courulescens


**Figure 1.** Selected Orchid Species found in Northern Samar