

INVENTORY ASSESMENT OF ORCHID IN PALAPAG, NORTHERN SAMAR, PHILIPPINES

KEZIAH MAE P. MILITAR¹, REGINA O. BELGA^{1,2} AND MANUELA CECILLE G. VICENCIO^{1,2*}

¹Department of Biological Science, College of Science

²University Research Office, University of Eastern Philippines,
Catarman, Northern Samar, Philippines

ABSTRACT

Orchid is the one of the ornamental plants which has high ornamental value. The aim of this study was to determine the species composition of orchids in Palapag, Northern Samar, Philippines. Purposive random sampling and interview using questionnaire were utilized in the collection of orchid species. A total of 20 orchid species were found in four (4) sampling sites, Barangay Sangay had the highest number represented by seven (7) species belonging to *Arachnis*, *Oncidium*, *Sphatoglottis*, *Phalaenopsis*, *Vanda* and *Cynoches* genera. Barangay Maragnao had six (6) species belonging to *Dendrobium*, *Phalaenopsis*, *Cattleya* Lindl, *Genra*, and Barangay Magsaysay with four (4) species belonging to *Aranda*, *Vanda*, and *Dendrobium* genera. Barangay Pangpang had three (3) species belonging to *Vanda* and *Platanthera* genera. Unidentified eleven (11) orchid species was recorded. Taxonomic identification of the nine (9) species was undetermined due to the unavailability of the inflorescence during the survey. This finding provided evidence that Palapag, Northern Samar harbors a number of endemic and understudied wild orchids. Thus, this study will serve as a baseline for conservation and starting point for orchid research in the province.

Keyword: orchid, species composition, Northern Samar.

INTRODUCTION

The Philippines being one of the 17 mega diverse countries of the world, identified in 1998 by Conservation International is a home to 15,000 species of plants; representing 5% of the world flora and bears the fifth rank in the number of plants species (CDB, 2009). Of these, about 8,050 species are angiosperms, 33 species are gymnosperms, 1100 species are pteridophytes, 1,271 species bryophytes, 3,555 species fungi and molds, about 1,355 species algae and 790 species are lichens (Gruezo, 1979). However, despite the notable biodiversity that country has, it is also very vulnerable to threat and biodiversity loss because of harmful manmade activities, like unstoppable deforestation, animal hunting, land degradation and overexploitation. Thus, it is highly probable that many of the species will succumb to extinction even before they are introduced and/or discovered (Morell, 1999).

Orchids are among of the best known and beloved plants by the scientists and amateurs because of their beautiful, diverse and interesting flowers (Herrera, 1998). This is the largest family among flowering plants (Huynh et al. 2009) not only in the Philippines, but in the whole world with an estimated 25,000 species (Gravendel et al. 2004). In the Philippines, more than 1,100 species of orchids are found, wherein 80% of which are endemic (Cootes, 2001). Moreover, the National List of Threatened Philippines Plants of Fernando et al. (2008) stated that there are 19 species

categorized as critically endangered, 335 endangered species, and 3 vulnerable species in the family Orchidaceae.

Because of the charismatic blooms and its high commercial value, orchids become one of the economic sources of the people living near the mountains. In addition, some species of orchids are bio-indicator and they also provide habitat for microscopic organisms. However, this group of species if orchids becomes more prone to extinction and are often over exploited because of their economic importance, such as ornamental, medicinal, flavoring, and perfume (Panal et al. 2015).

Panal et al. (2015) conducted a study which determines the conservation status of the family Orchidaceae as present on Mount Sinaka, Arakan, North Cotabato Philippines. Results of the study shows that out of 59 identified species found in the area 12 species are widespread, 22 are endemic, 1 vulnerable, 1 critically endangered (*Paphiopedilum adductum*), 1 endangered (*Corybus* sp.), 2 least concerned species, and 20 unassessed species. It has been also noted that there are probably some new species, which need through study for further verification.

Another study was conducted by Agapito (2009) in seven barangays of Bakun, Benguet from March 2009 to August 2009 to collect, identify and characterize the different endemic orchids growing in these barangays; and to determine the common orchid found in every barangays. Results showed that majority of the orchids

and characterized collected were found in barangay Poblacion, Bakun. This is due to its existing vegetation which provided a favorable environmental condition for the abundant growth of different orchid species and because mostly people in this barangay collect and domesticate orchids. On the other hand, barangay Gambang showed the least number of orchid species collected due to the use of large areas for Agricultural purposes and forest fires that destroyed the habitat of some orchid species. The most common orchids collected in most barangays in Bakun was *Dendrobium* species; *Trichoglottis braciata* were only found in barangay Bagu, Sinakbat, Gambang and Amusungan.

Esti Endah Ariyanti, Pa'l (2008) conducted the study entitled Orchids Inventory in Sintang Regency, West Kalimantan. The orchid inventory was done in TWA Bukit Kelam, TWA Baning and several places in Regency of Sintang, West Kalimantan. The result showed that there were 40 species belonged to 27 genera, which 32 species of them (20 genera) were epiphytic orchids and 8 species (7 genera) were terrestrial orchids.

Many more species await scientific description, but with the rapid destruction of the remaining forests, several species of orchid are becoming threatened or even endangered; some will never be known to the scientific community, or orchid enthusiast (Panal et al. 2015). thus conservation of them must be done, because they have a good prospect as commodity for trading such as parent stock, medicinal plant and ,material for cosmetic

perfume. Therefore, it's necessary to conserve it through in situ and ex situ conservation (Siregar et al. 2005) which can be started by orchid inventory.

Thus, the aim of this research was to have an inventory of orchid's species within the forested area of Palapag, Northern Samar, and to gain information about orchid species in this area. Furthermore, the species of orchids that has collected can be revealed by its potential for the benefit of education, conservation, display, reintroduction and others.

METHODOLOGY

This study was conducted in the Municipality of Palapag, Northern Samar. Palapag is located in the Northeastern part of Northern Samar and situated along coordinates 12u-31'-00 latitude and 125u'-00 longitudes. It is bounded on the North by the Pacific Ocean, on the East by the Municipality of Mapanas, on the West by the Municipality of Laong and the South by Municipality of Catubig all within the province of Northern Samar.

The town is subdivided by 32 registered barangays distributed in four regions namely woodland, riverside, east seaside, and west seaside. Its topographic situation shows that the huge area of Palapag is relatively plain or flat while the rest is grace with mountains and hills. To represent the whole region of Palapag, one barangay for each region was chosen as the study site. Barangay Magsaysay for woodland region, Barangay Sangay for

riverside region, Barangay Pangpang for west seaside and Barangay Maragno for east seaside.

Barangay Magsaysay belongs to woodland region and can be found on the three (3) kilometer western side of the municipality. Half of the western sides are hilly and the rest of the total land areas of the barangay is relatively plain. Its eastern side is bisected by the Palapag River and at the other side is Barangay Napo. It is composed of rice fields and production of fruits bearing tree land. And their type of agriculture should be left for timber production that can sustain the needs of the people. The total population based on their barangay profile in the year 2017 is 757.

Barangay Maragno is the farthest sampling site, is approximately 12.5 kilometers from the town proper and has total of 320 residents, and is mostly mountainous and forested. Residential houses are located along the shoreline facing the municipality of Mapanas.

Barangay Pangpang have the boundaries of Municipality of Pambujan on the west, Pacific Ocean on the North, and Catubig on the South the vegetation of the area was composed of mangrove tree species nipa palms and different kinds of tress.

Barangay Sangay is located along highway towards Barangay Napo. It has clay and rocky substrate. It has a sparse population of pasture lands. The topography is mostly flat land. A hill host water fall draining towards Barangay Napo.

Data Gathering Procedure

Actual survey and collection of Orchidaceae species was chosen by the researcher. The following material was used in collection: plastic bags, camera, pruning shears/knife and field notebook. One or two branches with undamaged leaves were obtained and preserved using denatured alcohol to prevent fungal growth. Flowers were preserved in a sealed plastic tube with 10% ethanol. During collection, all field data was recorded in the field morphological features of collected orchids species local name, place and date of collection of specimens gathered to aid in the succeeding process of identification

Identification and Classification of Orchids

All the samples gathered in the study area were identified using the book of Zdenek Jezek, The Complete Encyclopedia of Orchids. The researcher identified first the samples and Authentication/ Verification was done by specialist from the College of science.

Determination of Environmental Factors

This was done during sampling. GPS was used to locate the elevation; atmospheric pressure was determined in gathering secondary data and air temperature using thermometer.

a. Elevation- google earth application was used to provide specific elevation

of the specific area.

b. Atmospheric pressure- the result was gathered in the PAGASA for the secondary data.

c. Air temperature- the ambient air temperature was measured using a mercury thermometer for about 5-10 minutes.

Preparation of Herbarium

To preserve the plant specimens, this was subjected to the following procedure; poisoning, drying and mounting of the specimen in the herbarium sheet. The procedure of Philippine National Museum was followed for the preservation of samples.

1. Poisoning with help of denature alcohol it was thoroughly place or poisoned in a solution of 25% to avoid the growing of molds in the surface of the specimen.

2. Drying a number collected samples was sandwiched in a pile of newspaper, then another piled stock between another plant specimens.

With a cardboard alternately, to secure the samples a bamboo or a wood tightened with a rope, will be dried under the rays of the sun from morning to afternoon. Newspaper inside the plant press was changed every day to

prevent the spoilage of the collected samples.

3. Mounting all samples dried nicely and it was paste in the center of little piece of newspaper. It was folded and will have a heavy object place above them to have neat appearance. It will be labeled properly.

Economic Uses of Orchids

Data and information about economic uses in the study area was gathered through the use of researcher made interview guide. In every study site five (5) individual commonly farmer and permanently living in the study area was asked randomly with an age of 30 above, respondents were asked by the same question and their response of each question are all interpreted and noted.

RESULTS AND DISCUSSION

This chapter presents the orchids (family *Orchidaceae*) found in Palapag, Northern Samar as well as the environmental factors that prevail in the study areas and its economic uses.

Table 1. Inventory Assessment of Orchids Found in Selected Barangays of Palapag, Northern Samar. As shown in the table there are twenty (20) species of orchids identified and nine (9) species of orchid unidentified was recorded in four (4)

selected barangays of Palapag, Northern Samar.

Twenty (20) species under the family of Orchidaceae was identified, which are *Arachnisflos-aeris* (tiger plant), *Oncidiumvaricosum* (dancing lady), *Sphatoglottis* (ground orchid) *Dendrobium bigibbum* Lindl. (cook town), *Aranda broga*, *Vanda* (vanda), *Dendrobium auriculatum*, *Phalaenopsis schilleriana*, *Dendrobium phalaenopsis*, *Vanda scadens* Holtt. (wild orchid), *Phalaenopsis lindenii*, *Phalaenopsis intermedia*, *Dendrobium warawan*, *Phalaenopsis fuller*, *CattleyaLindl*, *Dendrobium x delicatum*, *Platantherabifolia* (butterfly orchid), *Cymbidium hybrid*, Yellow ground orchid, *Dendrobium x superbiens*. In Barangay Sangay recorded seven (7) number of orchid species. These were *Arachnisflos-aeris*, *Oncidium varicosum*, *Sphatoglottis plicata*, *Phalaenopsis schilleriana*, *Phalaenopsis lindenii*, *Phalaenopsis intermedia* and *Cymbidium hybrid*. This was followed by Barangay Maragano with six (6) species of orchid *Dendrobium auriculatum*, *Dendrobium phalaenopsis*, *Vanda scadensHoltt*, *Dendrobium warawan*, *CattleyaLindl* and Yellow ground orchid. Barangay Magsaysay with four (4) species of orchid; *Aranda broga*, *Vanda*, *Phalaenopsis fuller* and *Dendrobium x superbiens*. And lastly, for Barangay Pangpang, three (3) orchid species were recorded; *Dendrobium bigibbumLindl.*, *Dendrobium x delicatum* and *Platanthera bifolia*. The difference in the species richness between the four (4) sites maybe explained by the difference in many ecological factors such elevation, air temperature, microclimate condition and presence of

pollinators and mycorrhizal associates which have been reported to influence orchid diversity and distributions.

For the unidentified species, six (6) orchid species from barangay Sangay, one (1) from barangay Maragano, three (3) from barangay Magsaysay, and one (1) from barangay Pangpang were recorded. Taxonomic identification of the nine (9) species were undetermined due to the unavailability of the inflorescence during the survey. The nine (9) species of orchid (Family Orchidaceae) was unidentified these are Species A, Species B, Species C, Species D, Species E, Species F, Species G, Species H and Species I. All the identified orchids is found in the lower part of the four (4) study area except for the *Vanda Scadens* because it is found in the higher part of the the mountain in barangay Sangay. On the other hand those species unidentified found in different elevation whereas Species A is found in lower and middle part in the four (4) sampling site, Species B is in the middle part of barangay Magsaysay, Species C is found in the middle part of barangay Sangay, Species D is found in the three (3) sampling site except for barangay Maragano it is located in the lower and middle part. Species E is found in barangay Magsaysay and Sangay it is located in the middle part, Species F is found in barangay Sangay located in middle part, Species G is found in barangay Sangay in the higher part, Species H is found in barangay Pangpang in the lower part and Species I is found in barangay Maragano in the lower part.

Table 1. Species composition of Orchids (family ORCHIDACEAE)

SPECIES	SAMPLING SITE			
	Sangay	Maragano	Magsaysay	Pangpang
<i>Arachnisflos-aeris</i>	Present	Absent	Absent	Absent
<i>Oncidiumvaricosum</i>	Present	Absent	Absent	Absent
<i>Sphatoglottisplicata</i>	Present	Absent	Absent	Absent
<i>Dendrobium bigibbum</i> Lindl.	Absent	Absent	Present	Present
<i>Aranda broga</i>	Absent	Absent	Present	Absent
<i>Vanda</i>	Absent	Absent	Absent	Absent
<i>Dendrobium auriculatum</i>	Absent	Present	Absent	Absent
<i>Phalaenopsis schilleriana</i>	Present	Absent	Absent	Absent
<i>Dendrobium phalaenopsis</i>	Absent	Present	Absent	Absent
<i>Vanda scadens</i> Hollt.	Absent	Present	Absent	Absent
<i>Phalaenopsis lindenii</i>	Present	Absent	Absent	Absent
<i>Phalaenopsis intermedia</i>	Present	Absent	Absent	Absent
<i>Dendrobium warawan</i>	Absent	Present	Absent	Absent
<i>Phalaenopsis fuller</i>	Absent	Absent	Present	Absent
<i>Cattleya orchid</i>	Absent	Present	Absent	Absent
<i>Dendrobium x delicatum</i>	Absent	Absent	Absent	Present
<i>Platanthera bifolia</i>	Absent	Absent	Absent	Present
<i>Cymbidium hybrid</i>	Present	Absent	Absent	Absent
<i>Yellow ground orchid</i>	Absent	Present	Absent	Absent
<i>Dendrobium x superbiens</i>	Absent	Absent	Present	Absent
<i>Unidentified species A</i>	Present	Present	Present	Present
<i>Unidentified species B</i>	Absent	Absent	Present	Absent
<i>Unidentified species C</i>	Present	Absent	Absent	Absent

<i>Unidentified species D</i>	Present	Absent	Present	Present
<i>Unidentified species E</i>	Present	Absent	Present	Absent
<i>Unidentified species F</i>	Present	Absent	Absent	Absent
<i>Unidentified species G</i>	Present	Absent	Absent	Absent
<i>Unidentified species H</i>	Absent	Absent	Absent	Present
<i>Unidentified species I</i>	Absent	Present	Absent	Absent



Scientific Name: *Arachnis flos-aeris*
Local Name: Tiger plant



Scientific Name: *Oncidium varicosum*
Local Name: Dancing lady



Scientific Name: *Sphatoglottisplicata*



Scientific Name: *Dendrobium*



Local Name: Ground orchid
bigibbum Lindl

Name: Cook town orchid



Local

Scientific Name: *Aranda broga*



Scientific Name: *Vanda*

Local Name: Vanda



Scientific Name: *Dendrobium auriculatum*



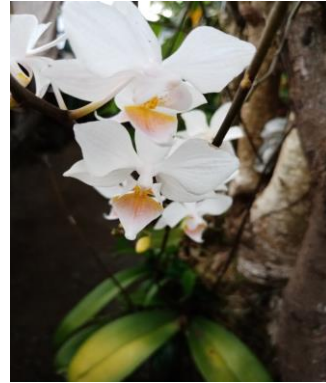
Scientific Name: *Phalaenopsis schilleriana*
Local Name: Moth orchid



Scientific Name: *Dendrobium phalaenopsis*



Scientific Name: *Vanda scadens* Holtt.
Local Name: Wild orchids



Scientific Name: *Phalaenopsis lindenii*



Scientific Name: *Phalaenopsis intermedia*



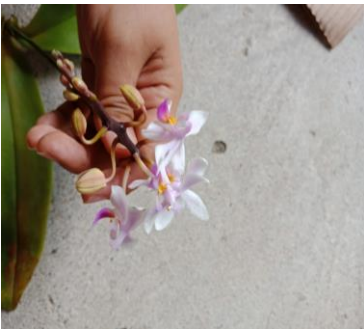
Scientific Name: *Dendrobium warawan*



Scientific Name: *Phalaenopsis fuller*



Scientific Name: *Cattleya orchid*



Scientific Name: *Dendrobium x delicatum*



Scientific Name: *Platanthera bifolia*
Local Name: Butterfly orchid



Scientific Name: *Cymbidium hybrid*



Local Name: Yellow Ground orchids



Scientific Name: *Dendrobium x superbiens*





Unidentified species A
Unidentified



species B

Unidentified species C

Unidentified species D



Unidentified species E



Unidentified species F



Unidentified species G



Unidentified species H



Unidentified species I

Table 2. Environmental Factors Prevailing in the Study Area

Sampling site	Air temperature (°C)			Altitude (m)		
	Low	Middle	High	Low	Middle	High
Sangay	29.5	27.8	29.2	126	130	164
Maragano	29.2	n/a	n/a	346	387	390
Magsaysay	29.3	27.3	27.5	10	n/a	n/a
Pangpang	29.2	29.1	29.1	26	n/a	n/a

As shown in the table, the air temperature in Baranagay Sangay is 29.5 in the lower part, 27.8 in the middle part, and 29.2 in the upper part, Barangay Maragano is 29.2 in the lower part, Barangay Magsaysay is 29.3 in the lower part, 27.3 in the middle part, and 27.5 in the upper part, and Barangay Pangpang is 29.2 in the lower part, 29.1 in the middle part, and 29.1 in the upper part.

Table revealed that the middle part has a warmer temperature compared to the upper and lower part. Thus, there are more orchid species in the middle part because warmer temperature favours/inhibit the growth and flowering of the orchid species (Blanchard MG & Runkle ES. 2006).

Furthermore altitude is another environmental parameters that can affect the growth of the orchid species. The area

Sangay has an altitude of 126 in the lower part, 130 in the middle part, and 164 in the higher part and Maragano has 346 in the lower part, 387 in the middle part, and 390 in the upper part. Meanwhile the Magsaysay and Pangpang which has plain surface had the lowest altitude of 10 meters and 26 meters. The higher altitude are able to withstand a broad range of climatic and environmental conditions that favors for the abundant growth of orchids, thus there are

higher number of orchid species in Barangay Sangay and Maragano. On the other hand, species at lower elevations are adapted to more specific environmental conditions such that they have narrow climatic tolerance, thus there are least number of orchid species in Magsaysay and Pangpang.

Table 3. Economic use of orchids (family *ORCHIDACEAE*)
In the study areas

Species	Economic use
<i>Arachnisflos-aeris</i>	√
<i>Oncidiumvaricosum</i>	√
<i>Sphatoglottisplicata</i>	√
<i>Dendrobium bigibbum</i> Lindl.	√
<i>Aranda brogan</i>	√
<i>Vanda</i>	√
<i>Dendrobium auriculatum</i>	√
<i>Phalaenopsis schilleriana</i>	√
<i>Dendrobium phalaenopsis</i>	√
<i>Vanda scadens</i> Holtt.	√

<i>Phalaenopsis lindenii</i>	√
<i>Phalaenopsis intermedia</i>	√
<i>Dendrobium warawan</i>	√
<i>Phalaenopsis fuller</i>	√
<i>Cattleya orchid</i>	√
<i>Dendrobium x delicatum</i>	√
<i>Platanthera bifolia</i>	√
<i>Cymbidium hybrid</i>	√
<i>Yellow ground orchid</i>	√
<i>Dendrobium x superbiens</i>	√

As shown in the table, the twenty (20) species of orchids in the four (4) sampling sites are well known for their economic importance particularly in horticulture and floristry. Furthermore, they are widely cultivated for ornamental purposes.

CONCLUSION

The four (4) barangays in Palapag, Northern Samar which serve as the sampling sites harbors a number of endemic and understudied wild orchids. This may be influenced by various ecological factors. As reported by Jacquemyn et. Al (2005), that orchid species composition changed continuously with altitude indicating turnover of species with increasingly altitude.

REFERENCES

Agapito FG. 2009. Collection and Characterization of Endemic Orchids in Bakun, Benguet State University, La Trinidad, Benguet.

Arditti J, Ernst R, Yam TW, Glabe C .1990. The Contribution to Orchid Mycorrhizal Fungi to Seed Germination. A speculative review. Lindleyana. Vol 5, p 249-255.

Bechtel, H., Cribb, P., and Launert, E. 1992. *The Manual of Cultivated Orchid Species*. Third Edition. MIT Press, Cambridge, Massachusetts.

Cootes J. 2001. *The Orchids of the Philippines*. Times Editions, Singapore.

De Leon MD, Cootes J, Cabactulan D, Pemintel R. 2017. Eight new orchid species from Bukidnon, Mindanao, Philippines, Orchideen Journal, Vol 5(1).

Dressier RL. 1981. *The Orchids: Natural History and Classification*. Harvard University Press, Cambridge, Massachusetts.

Panal CL, Opiso J, Opiso G. 2015. Conservation Status of the Family Orchidaceae in Mt. Sinaka, Arakan, North Cotabato, Philippines. *BIODIVERSITAS*, Volume 16

Siregar C, Listiawati A. 2005. Orchids Species of West Kalimantan. Institute of Tourism Research and Development in West Kalimantan, Pontianak, Indonesia.

Von Arx B. 1996. Conversation Strategy: International Protection. p. 11-14

William B. 1990. Orchids for Everyone: A Practical Guide to the Home Cultivation of over 200 of the World's Most Beautiful Varieties. London: Bamander Ltd. P.87

