

# Species Diversity of Mangroves in Catarman, Northern Samar

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## ABSTRACT

This study identified mangrove species in Catarman, Northern Samar which was categorized into families, genera and species. The researcher utilized transect line plot to determine the species composition of mangroves. A 10m x 10m plot was laid along calibrated rope where mangrove species were located. The mangroves were identified and classified taxonomically up to the species level using the Field Guide Manual to Philippine Mangroves. The researcher able to sampled nine true mangrove species and eight mangrove associates from the study area.

**KEYWORDS:** Mangroves, Catarman Northern Samar, transect line plot

**How to cite this paper:** Beberlie L. Medrano-Dangkeo "Species Diversity of Mangroves in Catarman, Northern Samar"

Published in International Journal of Trend in Scientific Research and Development (ijtsrd), ISSN: 2456-6470, Volume-5 | Issue-1, December 2020, pp.113-115, URL: [www.ijtsrd.com/papers/ijtsrd35857.pdf](http://www.ijtsrd.com/papers/ijtsrd35857.pdf)



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## INTRODUCTION

Philippines has about 7100 islands with 3 major islands, Luzon, Visayas, and Mindanao and has about 18,000 km of shorelines with vast areas of mangrove ecosystem.

Mangrove forest can be found generally along tidal mudflats and along shallow water coastal areas extending inland along Brackish water Rivers, streams and their tributaries. It is commonly found between the lowest and the highest tide level. These plants had evolved over time by developing special adaptive features allowing them to better survive in a harsh and stressful environment.

Mangroves could be utilized in a lot of practical ways like for firewood, charcoal and thatching for construction. Moreover, they provide other services such as coastal protection. Certain mangrove species help prevent flooding and erosion of unconsolidated coastlines by breaking the force of waves. Mangroves are suitable homes for epibenthic, in faunal and meiofaunal invertebrates and are able to support communities of phytoplanktons, zooplanktons and fishes due to the unique environment they create. Mangroves are also nurseries and feeding sites for some marine species and nesting grounds for hundreds of bird species.

However, despite of their environmental importance mangroves have suffered considerable degradation because of their relative accessibility, long history of conversion to aquaculture ponds and the expansion of coastal communities.

The consequent decline in the volume of commercially important resources caused by mangrove exploitation

prompted the researcher to conduct study of the mangrove species in Taguibi-an and University of Eastern Philippines shoreline, Catarman, Northern Samar.

## METHODOLOGY

This study was conducted in Catarman, that lies approximately 124°30' east longitude and 12°25' north latitude. Catarman is one of the 20 municipalities of the province located along the coastline facing San Bernardino Strait and the Philippine Sea. In the past decades, the coastal towns were protected against the impact of strong winds during bad weather or typhoons by thick mangrove vegetation. However, the forest has decreased rapidly due to clear-cutting of mangroves for charcoal making, firewood and conversion of mangrove swamps into fishponds, human settlement, and garbage dumpsites.

## Study Site I

The mangrove vegetation adjoining the mouth of Taguibi-an River is about 1.5 km east of Catarman and lies approximately 124°38' east longitude and 12°30' north latitude. It is just a narrow fringe but extending about 5 km inland along the meandering river where the water is brackish. The whole sampling site is not greatly influenced by tidal flooding during spring tides. However, the seaward and middle zones were reached by saline water daily during normal high tides and the sandy-muddy substrate is drained at low tides. The vegetation is composed of secondary growth dominated by *Avicennia marina* with *Nypa fruticans* occurring in littoral zone. These stands protected the banks of the river from soil erosion that may be caused by the floods during heavy rains. The mangroves are protected

from the full impact of the waves by the formation of a sand bar offshore. Accretion through the years has resulted to the extension of the sand bar to the eastern shoreline of the town proper. The sand bar is fully vegetated now. The mangrove area is frequented for fishing, shrimp and crab gathering, and nipa harvesting as these generate income to the families living near the mangrove area and along the riverbanks.

### Study Site II

The coastline of the University of Eastern Philippines campus is long and its intertidal area includes three of the four major habitats found in the tropical areas, namely: mangroves, rocky shore and coral reef (fringing reef). These diversified ecosystems offer opportunities for educational field trip, research and scientific pursuit, and recreation to people of Catarman and to the residents of the University Town. In this study, sampling/collection of data will be confined to the mangrove area being the object of concern.

The mangrove vegetation is located approximately 124°40' east longitude and 12°31' north latitude and 3 km east of Catarman. It is approximately 10ha (UEP 1998 as cited by de la Rosa, 1999) of secondary growth dominated by *Avicennia marina* growing on sandy-muddy or rocky substrate. The soil at the landward zone was black in color with obnoxious smell characteristic of the mangroves swamp and reached by the saline water at high tide while the substrate in the seaward and middle zones of the western portion were sandy-muddy, solid or corraline fragments usually drained of ocean water at low tides. In contrast, the sandy-rocky substrate in the eastern portion of the sampling site was always submerged in the saline water.

Fronting the mangrove community are the rocky shore and fringing reef. The rocky shore provided protection to the associated organisms in the mangrove forests against the mechanical effects of the wave action. But the mangrove trees and shrubs are exposed to strong winds especially during typhoons as the community is facing the Philippine Sea.

### Collection of Data

The sampling area in Study Site I (Taguibi-an) started from the Food Terminal to the mouth of the river with 200m inter-line distance while in Study Site II (UEP), the sampling area started at the back of Castillo's Residence to the Crystal Clear Water Refilling Station. Data gathering of the

mangroves was conducted during low tides. This study employed a descriptive research design. The transect-line plot was utilized. A 10m x 10m plot was laid along calibrated rope where mangrove species were located. The mangroves were identified and classified taxonomically up to the species level using the Field Guide Manual to Philippine Mangroves by Primavera et al (2004).

### Species Composition of Mangroves

The transect line plot method was utilized to determine the species composition of mangroves. To determine the starting point of the transect line, a stake was thrown at the seaward margin of the mangrove vegetation. Then, where the stake falls a transect tape or a calibrated rope was laid from the seaward of the community up to the inner portion above the high tide level. Stake was placed along the line at 20m intervals to mark the sampling points where plots of 10m x 10m was established. Five transects with varying lengths was established at 200m inter-line distance in the sampling site. By using the X and Y coordinates, each mangrove species in the plot or quadrat was located and identified. Leaves, flowers, and fruits of every species was collected in every plot for identification and verification purposes. About 1 foot of the shoot was collected for the plant with no flower during the sampling period.

### Preparation and Preservation of Specimens

Plant samples were sorted, cleansed and separately placed inside labeled plastics to facilitate identification of the species correspondingly present in each transect and quadrat. Drying method with the use of improvised drier used in the herbarium preparation of vascular plants for samples of flowering plants or mangrove species. Extra care was observed in order not to mix and confuse the collection and also to minimize human errors. Identification and classification of the specimens was done with the aid of illustrations, manuals, field guides and books.

### RESULTS AND DISCUSSION

The study identified the species composition of mangroves in Catarman with 12 families, 15 genera, and 17 species. The true mangrove species belonged to 5 families namely: *Avicenniaceae*, *Combretaceae*, *Myrsinaceae*, *Rhizophoraceae*, *Sonneratiaceae*. The result showed that the identified species is much lesser than the species identified by de la Rosa (1999) having 15 families, 21 genera and 24 species. The species composition of mangroves in Catarman Northern Samar is presented in Table 1.

**Table 1 Species composition of mangroves in Catarman N. Samar**

Species	Study Site I	Study Site II
1. Family <i>Acanthaceae</i> <i>Acanthus ilicifolius</i> Linn.	√	X
2. Family <i>Apocynaceae</i> <i>Cerberamanghas</i> Linn.	√	X
3. Family <i>Arecaceae</i> <i>Nypafruticans</i> Wurmb.	√	√
4. Family <i>Avicenniaceae</i> <i>Avicennia marina</i> (Forsk.) Vierh.	√	√
5. Family <i>Caesalpiniaceae</i> <i>Erythrina orientalis</i> (Linn.) Murr.	√	X
6. Family <i>Combretaceae</i> <i>Terminalia catappa</i> (Linn.)	√	X
7. Family <i>Myrsinaceae</i> <i>Aegiceras corniculatum</i> (Linn.) Blanco	√	X
8. Family <i>Pandanaceae</i> <i>Pandanus tectorius</i> Sol.	√	X
9. Family <i>Polypodiaceae</i> <i>Acrostichum aureum</i> (Linn.)	√	X
10. Family <i>Polypodiaceae</i> <i>Drynaria quercifolia</i> (L.) J. Sm.	√	X
11. Family <i>Rhizophoraceae</i> <i>Rhizophora apiculata</i> Blume	√	X
12. Family <i>Rhizophoraceae</i> <i>R. mucronata</i> Lamk.	X	√
13. Family <i>Rhizophoraceae</i> <i>R. stylosa</i> Griff	X	√

14. Family <i>Rhizophoraceae</i> <i>Bruguiera cylindrica</i> Sol	X	√
15. Family <i>Rhizophoraceae</i> <i>Ceriops tagal</i> (Perr.) C.B. Robins	√	X
16. Family <i>Sonneratiaceae</i> <i>Sonneratiacasiolaris</i> (L.) Engl.	√	√
17. Family <i>Sterculiaceae</i> <i>Heritieralittoralis</i> Dryand	√	X
<b>Number of Species</b>	<b>14</b>	<b>6</b>

Legend:           √ = present                           X = absent

The Study Site I (Taguibi-an) was composed of secondary growth mangroves characterized by luxurious growth of *Avicennia marina* on muddy substrates where the seawater and freshwater mixed in ideal proportion. Study Site II (University of Eastern Philippines) was dominated by the shrubby growth of *A. marina*, on sandy-muddy, corraline and rocky substrates that were directly exposed to strong waves and storm surges. In Study Site I mangrove species were found at the middle zone made up of *Sonneratiacasiolaris*, *Ceriops tagal*, *Aegicerascorniculatum*, *Terminalia catappa*, *Heritieralittoralis*, *Erythrina orientalis*, and *Cerberamanghas*. These species were observed to have broader leaves than *Avicennia marina* to be able to catch sunlight. The epiphytic fern *Drynariaquercifolia* was found attached to trunk or branch of *A. marina*. The forest floor was composed of the presence of *Nypafruticans*, *Acanthus ilicifolius*, *Pandanus tectorius*, and *Acrostichumaureum*. These associates may have hindered the establishment and growth of *A. marina* seedlings, as the floor was observed to be devoid of saplings.

## CONCLUSIONS

The species composition of mangroves in Catarman belonged to 12 families, 15 genera, and 17 species. The true mangrove species belonged to 5 families namely: *Avicenniaceae*, *Combretaceae*, *Myrsinaceae*, *Rhizophoraceae*, *Sonneratiaceae*.

Nine true mangrove species from the study area were sampled namely: *Avicennia marina*, *Terminalia catappa*, *Aegicerascorniculatum*, *Rhizophora apiculata*, *R. mucronata*, *R. stylosa*, *Bruguiera cylindrica*, *Ceriops tagal*, *Sonneratiacasiolaris* and eight mangrove associates namely: *Acanthus ilicifolius*, *Cerberamanghas*, *Nipa fruticans*, *Erythrina orientalis*, *Pandanus tectorius*, *Acrostichumaureum*, *Drynariaquercifolia*, *Heritieralittoralis*.

Among the mangroves associates, *Nypa fruticans* was the most utilized and economically important species to the mangrove dwellers in Taguibi-an and the nearby barangay. *Nipa* leaves are primarily used for shingle production for roofing and walling of low cost housing in the province. For this reason, *nipa* was planted extensively in the riverbank of Taguibi-an and tidal mudflats of Brgy. Bangkerohan.

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