

BENCHMARK STUDY ON THE SPECIES AREA CURVE OF MOUNT LANTOY, ARGAO, CEBU

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ABSTRACT

The study aimed to know the species area curve relationship in Mount Lantoy as well as the species composition, species diversity and relative abundance. Data collection and analysis were conducted through species area curve method.

Result shows high species diversity observed. Likewise the plots established in the lower have more species composition compared to middle and upper slope. Most of them were dicot species. The 8 x 16 meters plots size was found to be the most suited in conducting sampling inventory in mount lantoy.

Mount Lantoy has a total of 120 species which include 68 families, and 81 genera. Out of the total species 88 of them were dicot, 9 species were monocot and 23 species were ferns and allies. Five endangered species based from DENR (2007) national list were found in the area. Protection and conservation of the species in mount lantoy was necessary.

INTRODUCTION

Mount Lantoy is one of the 117 important bird areas in the Philippines (Mallari, et. al, 2001). Report shows, this mountain contains natural forest fragments where in some endangered plant species included in the National list of the DENR (2007) were cited in the area. However, no records are available studying on the species composition, diversity, relative abundance and the specific sampling inventory suited in the area. Based from the study of Quimio (2001), there is no report on systematic ground survey of vegetation in any part of Cebu.

The species – area curve was quickly recognized as an important tool in community description and was used as a guide in the determination of minimal area of a community. Species – area curve is a graph recording the cumulative numbers of species of living things recorded in a defined area of particular environments as a size of the area examined (Barbour, et. al, 1980).

Braun – Blanquet (1932) emphasizes that a minimal area is considered the smallest area which can contain an adequate representation of an association. Understanding plant association is an important requirement in studying the characteristic combination of species. The spatial diversity patterns of species are important implication in the conservation of biodiversity.

Benchmarking on the current state of species area curve in Mount Lantoy are important input to development planning particularly in the prioritization of management support and enhancement of opportunities to success.

MATERIALS AND METHODS

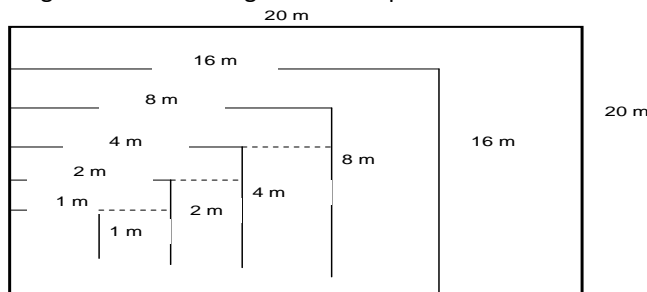
Environment

The study was conducted in Mount Lantoy of barangay Tabayag, Argao, Cebu. Mount Lantoy is generally a karst limestone forest which is currently covered with secondary growth forest with few remnants species of the previous vegetation. However, the lower part of the mountain was planted with exotic species like Mahogany (*Sweitenia macrophylla*).

Field Layout

Nine plots were laid out at 20 x 20 meters in different elevation (lower slope, middle slope and upper slope). Each plot was subdivided into different sub - plot (1x1, 1x2, 2x2, 2x4, 4x4, 4x8, 8x8, 8x16, 16x16 and 20x20). Vegetation in each sub – plot was studied and identified by using the species – area curve method.

Fig. 1. Schematic Diagram of the Species Area Curve Method



Data collected

Plant species was collected from each sub – plot for taxonomic identification and classification. Those species not identified was brought to the Visayas State university herbarium for proper identification and classification.

Data Analysis

The identified plant species was tabulated and vegetation was analyzed on the species – area curve. Graphs were made to show the trend of species diversity of each sub – plot. Total species composition, Species diversity, and its relative abundance were also determined. The common families and genera of the species were also considered. Result and Discussion

Species Area Curve

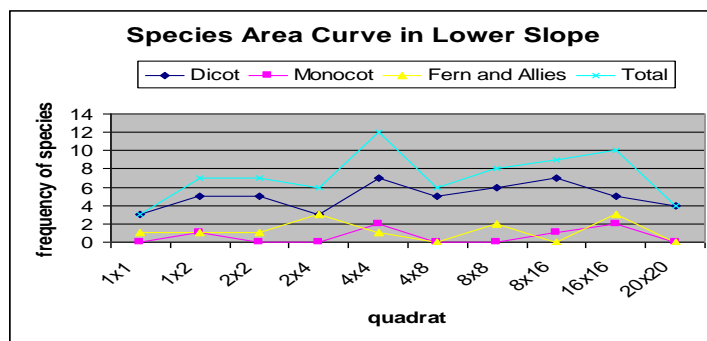


FIG. 2

Lower slope of Mount Lantoy were dominated by Dicot species. Majority of this dicot species are trees with few shrub. However, this trees exhibit smaller diameter. Monocot has a difficulty in surviving in the area because of its closer canopy, but advantageous to ferns and allies species which only need fewer sunlight compared to monocot.

The species diversity in each sub plot was increasing from 1x1 to 16x16 meters, but decreases when it reaches to 20x20 meters. Therefore based on species area curve relationship the appropriate plot size for lower slope is 16x16 meters. The result emphasize further that Mount Lantoy are still covered by tree species with higher diversity which could still support the needs of wildlife in the area.

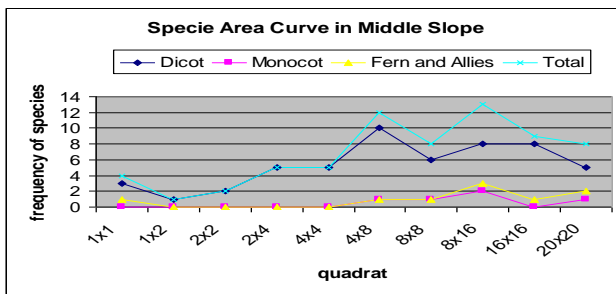


FIG. 3

Middle slope are still dominated by Dicot species. Both monocots, fern and allies species had a difficulty in surviving in the area because of the change in climatic conditions not favorable to their growth. The area were densely covered with smaller diameter trees with little amount of sunlight passing through the canopy.

The diversity of species in each subplot is in increasing trend from 1x1m to 8x16 meter, but decreases there in from 16x16m to 20x20m. Based from species area curve relationships the appropriate plot size for sampling inventory in middle slope is 8x16 meters.

The result further emphasize that middle slope are still covered by trees but less diverse as compared to the lower slope. This would be the effect of illegal cutting and soil erosion that were observed in the area.

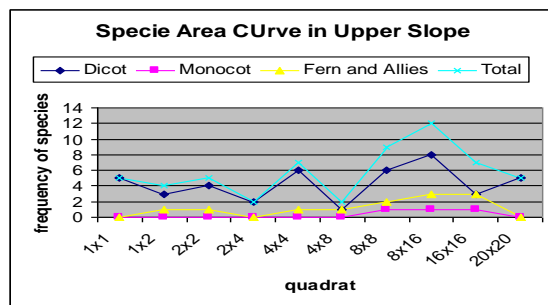


FIG. 4

The upper slope of Mount Lantoy is still dominated by Dicot species. The site was favorable to Ferns and allies species compared to monocot based on their species composition.

The species diversity in each subplot was also increasing from 1x1meter to 8x16meter and decreases from 16x16m to 20x20m. This means that the appropriate plot size in conducting sampling inventory in the upper slope of Mount Lantoy is 8x16 meter.

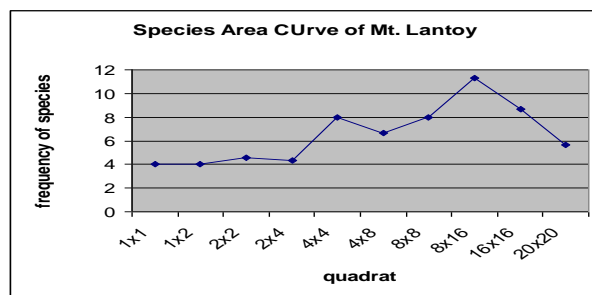


FIG. 5

The trend of species diversity of each plot increases from 1x1 m up to 8x16m and decreases in 16x16m to 20x20m. This means that the appropriate plot size in conducting sapling inventory in Mount Lantoy is 8x16m. The number of species covered by 16x16m and 20x20m plot size could not compensate to the effort exerted in increasing the size of the plot, anyway the species found in the plot could still be assessed if we will increase the number of plots to be sampled.

Species Diversity

Table 1
Species Diversity in Mount Lantoy

Life Forms	Species			Total	Mean
	LS	MS	US		
Dicot	55	53	43	151	50.3
Monocot	5	5	3	13	4.3
Ferns & Allies	12	9	12	33	11
Total	72	67	58	197	
Grand Mean					65.6

Mount Lantoy was dominated by Dicot species. Fern and Allies species were adopted much to the existing condition of Mount Lantoy compared to monocot based on their species composition. The presence of ferns species in the site indicated that the area has a lower temperature than other areas. This result implies that Mount Lantoy has high species diversity and could still support the needs of the existing wildlife. However, Mount Lantoy is now threatened by the rampant cutting, charcoal and hunting as observed in the area.

Species Composition

Mount Lantoy has a total species composition of 120, with 68 families and 81 genera. Among this species 88 of them were dicots, 9 monocots and 23 ferns and allies. Most species were belong to the families of Sapindaceae, Elaeocarpaceae, Guttiferae, Rhizophoraceae, Moraceae and Fabaceae.

The common genera were *Trigonachras*, *Canarium*, *Caralla*, *Sloanea*, and *Ormosia*. Five species were observed in the site as endangered species based on the DENR (2007) National list. These include Cebu Cinnamon (*Cinnamomum mercadoi*), Tindalo (*Azelia rhomboidea*), Ipil (*Intsia bijuga*), Molave (*Vitex parviflora*) and narra (*Pterocarpus indicus*) (Lillo, 2004).

Relative Abundance of Species

Table 2
Relative abundance of Species in Mount Lantoy

Species	Frequency
1. <i>Trigonachras falcatuspidata</i>	900
2. <i>Bitanghol sp.</i>	269
3. <i>Sloanea sigun</i>	178
4. <i>Triphasia grandifolia</i>	127
5. <i>Ormosia calavensis</i>	109
6. <i>Voacanga globosa</i>	75
7. <i>Buchanania arborescens</i>	39
8. <i>Homolanthus elata</i>	38
9. <i>Micromelum compressum</i>	34
10. <i>Canarium asperum</i>	30
11. <i>Pterocarpus indicus</i>	26
12. <i>Vitex parviflora</i>	20
13. <i>Heritiera sp.</i>	20
14. <i>Palaquium luzoniense</i>	12

15. <i>Afzelia rhomboidea</i>	10
16. <i>Intsia bijuga</i>	10
17. <i>Cinnamomum mercadoi</i>	5

Mount Lantoy is still containing a fragment of forest area which is dominated by *Trigonachras falcatocuspidata*. Although this species categorized by Rojo (1999) as small trees, but they densely occupying the area. There are also large trees found in the area which could be considered as remnant species from the previous vegetation like *Vitex parviflora*, *Pterocarpus indicus*, *Canarium asperum*, *Palaquium luzoniense*, *Afzelia rhomboidea*, *Intsia bijuga*, and *Cinnamomum mercadoi*. These species were already considered as endangered based from the national list of DENR (2007). However, in Mount Lantoy seedling of this species still exist.

CONCLUSION AND RECOMMENDATIONS

The study aimed to know the species area curve relationship in Mount Lantoy as well as the species composition, species diversity and relative abundance. Data collection and analysis were conducted through species area curve method.

Result shows high species diversity observed. Likewise the plots established in the lower slope have more species composition mostly were dicot species. The 8 x 16 meters plots size was found to be the most suited in conducting sampling inventory in mount lantoy.

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CONCLUSION

1. The 8 x 16 meters was found to be the most suited plot size in conducting sampling inventory in Mount Lantoy.
2. Mount Lantoy has a total of 120 species which include 68 families, and 81 genera. Out of the total species 88 of them were dicot, 9 species were monocot and 23 species were ferns and allies.
3. Mount Lantoy is still containing a fragment of forest area which is dominated by *Trigonachras falcatocuspidata*.
4. There are also large trees found in the area which could be considered as remnant species from the previous vegetation like *Vitex parviflora*, *Pterocarpus indicus*, *Canarium asperum*, *Palaquium luzoniense*, *Afzelia rhomboidea*, *Intsia bijuga*, and *Cinnamomum mercadoi*. These species were already considered as endangered based from the national list of DENR (2007). However, in Mount Lantoy seedling of this species still exist.

RECOMMENDATION

1. These remaining natural patches of forest in Mount Lantoy must be conserving and protected due to its high endemism of species.
2. The LGU and the community must extend their support in controlling the rampant cutting and hunting in Mount Lantoy.

3. DENR must apply the Rain forestation technology in Mount Lantoy to improve the endemism of species in the area.
4. Wardening system must be applied in Mount Lantoy.
5. Socio – economic profile of the community that surrounds Mount Lantoy must be surveyed.

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